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Storytelling: A Natural Mnemonic: A Study of a Storytelling Method to Positively Influence Student Recall of Instruction

Tommy Oaks
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To the Graduate Council:

I am submitting herewith a dissertation written by Tommy Oaks entitled "Storytelling: A Natural Mnemonic: A Study of a Storytelling Method to Positively Influence Student Recall of Instruction." I have examined the final electronic copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in .

<div align="right">Thomas N. Turner, Major Professor</div>

We have read this dissertation and recommend its acceptance:

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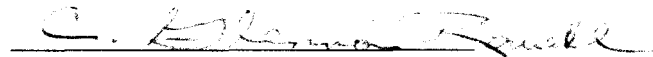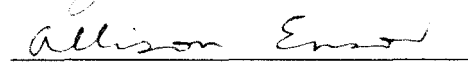
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Accepted for the Council:

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Associate Vice Chancellor and
Dean of the Graduate School

Storytelling: A Natural Mnemonic

A Study of A Storytelling Teaching Method

To Positively Influence Student Recall of Instruction

A Dissertation

Presented for The

Doctor of Philosophy

Degree

The University of Tennessee,

Knoxville

Tommy Oaks

December, 1995

Dedication

I love to tell the story,

For those who know it best

Seem hungering and thirsting

To hear it like the rest.

And when, in scenes of glory,

I sing the new, new song,

'Twill be the old, old story

That I have loved so long.

Abstract

The purpose of this dissertation was to determine what, if any, effect storytelling as a method of teaching has on retention of information. More specifically, this work was designed to determine if storytelling is more effective than a more traditional lecture method in influencing student recall of lesson content. In the Spring Semester of 1994, experiments were conducted to test the following hypothesis: *College Students who receive instruction in a storytelling fashion will demonstrate significantly greater recall of instructional content than students who receive the same instruction in a more traditional lecture method.*

One hundred fourteen students were randomly selected from undergraduate college courses in Instructional Media and Technology. After reading and signing letters of consent, students were randomly assigned to either a control or experimental group. Both groups were first pretested, then taught the same material in different fashions. The control group was instructed with the lecture method, while the experimental group was given the same content by means of a storytelling method. Recall of the instructional content was then tested in three posttests: one given immediately following instruction; the second and third tests three and five weeks following. A t-test was performed on test scores to determine if there was a significant difference in the scores of the control and experimental groups. All t-test scores showed statistically significant gains in recall by the experimental group over the group that received instruction via the lecture method.

The null hypothesis was rejected. This study indicates that, for the population described in the experiment, instruction in a storytelling fashion can

make a positive difference in the recall of instructional material.

Implications of this conclusion are discussed for three groups: Educational Researchers, Writers and Producers of Curriculum Materials, and Classroom Teachers.

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Introduction

"I don't remember."

Madeline Hunter once said that those three words stood like three tombstones, commemorating defeat, in any teaching-learning situation (1967). Hearing those three "tombstone" words can be a disappointment to most teachers.

Learning involves more than the ability to recall, and the ability to remember is not the only goal of teaching. However, it is hard to determine whether a person has successfully learned what he or she cannot remember, and one could not be said to "know" something if one could not find it in memory when it is needed. It seems obvious, but a piece of knowledge has to be acquired before it can be retained. On the other hand, we can only determine whether a person has successfully learned something by having him demonstrate its retention. It is also somewhat questionable whether or not material that is not remembered can have any real lasting effects on learners. Most teachers, consequently, present material that they hope will be remembered. In fact, teachers literally work with memory every day, in that they begin with students who do not know certain concepts and work to produce students who will be able to recall that information at will. To teach in such a fashion as to facilitate recall of instruction is therefore a valid and important educational goal.

Many educators have recognized a relationship between effective teaching and student recall of instruction. Weinstein and Mayer(1986) defined good teaching as a "conjunct of activities" where the learner learns, among other things, *how to recall.* Mayer (1984) designated one aspect of learning as

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a change recorded in the *memory* of the learner. Bloom (1956) contended that knowledge involves the *"recall* of a pattern, structure or setting. Scruggs and Mastropieri (1992) argued that good memory skills are important, and that memory strategy instruction has a very important yet unrealized place in schools.

This study focused on a method of teaching that holds promise for positively influencing student recall. It is by no means a revolutionary or new method. As Nietzke (1989) observed, " Sometimes teachers can ignore an obvious method of effective teaching. There is one method, for instance, that captures people's interest immediately, involves them mentally and emotionally, keeps their attention, and makes a significant point that will be remembered. It is a simple, ancient method, always ready to be discovered anew by teachers. This method is storytelling." The experiment described in the following pages was conducted to test the ability of a storytelling method of instruction to positively influence student recall of instructional content.

The Problem

The 1980's and 1990's have been an era in which educators are immensely concerned with retention. By definition many of the national and state evaluation instruments, not to mention teacher-made tests, are concerned with the retention of knowledge. The increasing pressure upon teachers for their students to perform well on such tests has had a significant impact on the classroom. Simply stated, the problem that this study addressed was students forgetting instruction. Just how much they forget has not been firmly established. Neisser (1982) claimed that "...it is difficult to find even a single

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study, ancient or modern, of what is retained from academic instruction." Bahrick (1991) asserted that "...academic content has been neglected because it consists typically of knowledge and principles (i.e., semantic content rather than episodic content), and experimental research has been unable to study the loss of semantic content." As far back as 1949 educators observed that the forgetting curves for specific information looked very much the same as forgetting curves for nonsense syllables. Tyler (1949) then claimed that typically students will have forgotten fifty per cent of the information they acquire within a year after completing a course, and seventy five percent within two years after completing a course. Bahrick (1979) commented that "...much of the information acquired in classrooms is lost soon after final examinations are taken." One recent national report documented that American students have become deficient at recall of some of the most basic information about history and literature. For example, only one out of three American seventeen-year-olds could place the Civil War within the correct half-century or correctly identify the Reformation or the Magna Carta (Scruggs and Mastropieri, 1992).

Regardless of *how much* students forget, it is advantageous for con-cerned teachers to investigate instructional strategies that hold potential for enhancing recall with fewer repetitions of information. One such strategy that has been and continues to be used by teachers is the *mnemonic*. A mnemonic is any technique or system to improve or aid the memory, usually by the use of some formula. Popularly, mnemonics have been called memory aids, memory crutches, or memory hooks. From such labels one might have the idea that they are merely gimmicks--not legitimatetechniques to improve memory. This is far from the truth. Research has confirmed that there can be such a thing as a mnemonic approach to teaching--a course of action deliberately taken for the

purpose of enhancing recall (Pressley, et al, 1982), and that the use of such strategies can increase learning (Pressley, 1983).

Some studies have indicated that there are methods of teaching that positively affect recall. In the late 1960' and 1970's, studies of Keller's (1968) Personalized System of Instruction and Bloom's (1968) Learning-for-Mastery indicated that both methods produced students that retained more of what they originally learned (Corey and McMichael, 1974).

The motivation for this study was a conviction that one ancient method of teaching contains innately many of the characteristics of mnemonics and mnemonic instruction. This method is storytelling. While other teachings strategies have been deliberately designed to influence memory, storytelling "naturally" contains qualities that have been shown to positively influence recall. For this reason, it may be labeled a "natural" mnemonic, and it may hold much potential for teachers concerned with positively affecting student recall of instructional content.

During the summer of 1992, a pilot study designed to test student recall of instruction was conducted at the University of Tennessee. A class of college undergraduates was randomly divided into two groups. Each group was given the same information during a class period. One group was taught with a combination of lecture and workshop, while the other group was taught with a storytelling format. A fourteen item test was administered to both groups immediately following the instruction and again two weeks later. In both tests, the storytelling group recalled *twice as much* as the other group. The performance of the storytelling group became the genesis for the question, *Can it be demonstrated that material presented in a storytelling fashion will result in greater student recall of the content than if it were presented in some other*

fashion? If storytelling positively affects student recall, then it needs to be included in the repertoire of teaching strategies of any teacher concerned with addressing the problem of student forgetting of instruction. An attempt to answer this question led to the study that follows. As will be discussed later in the literature section, the benefits of storytelling in the classroom are increasingly being appreciated. Stories are now providing opportunities for a wide range of learning experiences. Unfortunately, much of the contemporary literature relating to storytelling in the classroom is anecdotal and evangelistic in nature. Educators are giving testimony to classroom successes through using storytelling and storytelling techniques. Experimental studies that explore story-telling as a method of affecting student recall, however, are virtually nonexistent. For this reason, this work was something of a pioneer effort: an attempt to break new ground in experimentally affirming or denying the ability of storytelling to influence recall of instruction.

Purpose

The purpose of this study was to determine what, if any, effect storytelling as a method of teaching has on retention of information. More specifically, this work was designed to determine if storytelling is more effective than a traditional lecture method in affecting lesson recall.

Hypothesis

In order to test the effectiveness of storytelling as a mnemonic, an experiment was conducted to test the following hypothesis: *College Students*

who receive instruction in a storytelling fashion will demonstrate significantly greater recall of instructional material than students who receive the same instruction in a more traditional lecture method. For statistical testing, the above hypothesis was translated into the null hypothesis *College students who receive instruction in a storytelling fashion will not demonstrate significantly greater recall of instructional material than students who receive the same instruction in a more traditional lecture method.*

Definition of Terms

In this study, the following terms were used as defined.

A Story: Basically, a narrative which recounts a sequence of events. As such, a story can be comprised of a setting and one or more episodes which may be linked sequentially, temporally, or causally (Stein, 1979; Roth, 1986). Stories usually but not inevitably involve locations, landscapes, protagonists, intentions, emotions, conflicts, obstacles, struggles, and consequences (which always lead into new stories.) (Smith, 1990).

Storytelling: The *oral* presentation of stories. It is also the *telling* (in contrast to the reading) of stories.

To teach in a storytelling fashion : Indicates that the teacher takes the material to be learned and either presents it as a story, places it within a story, or illustrates it with a story or stories deliberately chosen to aid in the compre-hension and/or recall of the information. The specific storytelling fashion used in this experiment was to embed the material to be learned within a story (the text of this story may be found in Appendix D). This method of presenting material is similar to the *Story System* described elsewhere in this document.

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Mnemonic: A mnemonic is any technique or system to improve or aid the memory, usually by the use of some formula. Simple rhymes, like "thirty days hath September, April, June and November" are one type of mnemonic. Basically, all mnemonic systems teach the user to *pay attention,* to *organize* the material to be learned, usually by *linking* or attaching it to some previously learned organizational scheme (Mastropieri, 1989). Within this process, information is normally broken into *smaller, simpler parts*, and an attempt is made to use imaginative, concrete, visual images that convey some *meaning to the user* (Siwolop, 1983; Norman, 1969). Several types of mnemonics are discussed in Chapter 2. They are briefly defined below:

Keyword mnemonics are is based on the observation that cognates or other orthographically similar words from one's native language can act as verbal mediators between the written representation of a word and its target language pronunciation. For example, students of German can use *flesh* in English to mediate between the German word *Fleisch* and its specific English translation *meat.*

Pegword mnemonics involve learning a list of rhyming peg words and pairing images with the first twenty or so integers (for example: one is a bun, two is a shoe, three is a tree, etc.) The learner then uses the peg words as imagined pegs upon which to hook items to be remembered.

Rhymes, or metrical mnemonics involve placing information to be remembered in a rhyme, such as " In fourteen hundred ninety two/Columbus sailed the ocean blue."

Loci mentally places items to be remembered in different physical locations, such as mentally placing items to be remembered in the various rooms of a house.

Successive-comparisons or linking mnemonics places, or "links" items to be remembered in a chain, with each item relating in some vivid fashion to the previous item.

The Story System involves creating a story based on items to be remembered. The story begins with the first item and proceeds, introducing additional items as the story progresses.

More traditional lecture method: The focus of this study was the college classroom. While styles may vary, the more common teaching method used in the college classroom tends to be teacher-talk or lecture. Jumpeter (1985) called this method the "lecture-demonstration method." Here the instructor is the prime participant, while the student's activities are noticeable when taking examinations or participating in classroom discussions. A traditional view of lecture might be that of the person "up front" doing all of the talking while the audience politely listens. Few instructors teach entirely in this fashion. Often a classroom lecture will include periodic questions and other opportunities for student feedback (the text for the lecture used in this experiment is found in Appendix E).

Recall : Refers simply to remembering or producing spontaneously the information requested, such as must be done for a written test (Halpin and Halpin, 1982). Psychologists consider memory to be a different process from learning, although the two are closely related. Whereas learning refers to the acquisition of new behaviors, memory refers to the process of saving or storing information so that it might be available when needed (Weber, 1991).

Terms related to recall: Several terms were used to describe factors that facilitate retention. Brief definitions of these terms are below, followed by more elaborate descriptions in Chapter 2.

Visualization refers to mentally picturing the objects, events or ideas that words represent.

Association, or Positive Transfer occurs whenever learnings in one's past experience are used to help remember something in the present. Essentially, new items are associated with what is already known.

Feeling Tone refers to the emotional content of material, as well as how material is presented. People generally remember pleasant experiences easier than unpleasant ones.

Limitations, Delimitations

At the time of this study, contemporary research testing the effectiveness of storytelling with a population of college students had not been conducted. For this reason, the study was conducted with college undergraduates, ages 18-25. All of the students tested were enrolled in Instructional Media and Technology courses. Consequently, the findings of this study may only be generalized to a similar population.

Currently, the time that elapses between the test of original learning and the retention test may vary from a few hours to several years (Bahrick, 1984b). The time limitation for this study was a five-week period during the fall semester at the schools where students were tested. The longest period of time between the treatment and the final test of recall was approximately five weeks. Ideally, subjects should be tested after longer periods of time in order to more fully test long-term recall. Consequently, findings here may be generalized up to a five-week gap between receiving instruction and recalling it in a testing situation.

The pretest and the posttests were identical tests, i.e., the same

questions were asked on each test. Currently no real "rule" has been established with reference to testing for recall. Runquist (1983) discussed the relationship of the retention test to the original test. His conclusion was that whatever the relationship between tests, it needs to be specified. Eurich (1934) used identical forms of the original and retention test to study differences between recall and recognition items. Halpin and Halpin (1982) also used identical tests in a study of the effects of studying and testing on retention. Studies by Semb, Ellis, and Montague (1990) and Semb, Ellis and Arajuo (1991) attempted to address some of the issues related to same versus different tests. Students took two retention tests at the end of retention intervals; a test identical to the one taken at the end of the course, and a "parallel" form of test. The results of these studies indicated that students retained specific questions better than the "parallel" questions.

The decision to use identical tests was based on Semb, et.al.'s conclusion. While giving identical tests might be a form or repetition, it was decided that it would give no real advantage to either group, since both groups would be receiving the same tests.

Organization of This Study

This study was organized as follows. Chapter two contains a summary of previous research in the fields of memory or recall, mnemonics, storytelling as a teaching method, and characteristics common to both storytelling and mnemonics. The third chapter describes the methods and procedures that were developed for an experiment designed to test the hypothesis that *College students who receive instruction in a storytelling fashion will demonstrate*

significantly greater recall of instructional material than students who receive the same instruction in a more traditional lecture method. Chapter four records an analysis of the results of this experiment, and the fifth chapter offers conclusions and suggested implications from the results of the experiment.

The next chapter chronicles an investigation of storytelling as a teaching method. Second, writings in the field of memory or recall are discussed. A particular emphasis was placed on what has been learned about factors known to positively affect recall, followed by an inquiry of what was known about the qualities of mnemonics that influence recall . The chapter concludes with what is known about characteristics that storytelling holds in common with mnemonics, including a review of a mnemonic method of instruction known as the Story Form.

Chapter 2
Previous Research

This study was designed to determine what, if any, effect storytelling as a method of teaching has on retention of information. More specifically, this work was fashioned to determine if storytelling is more effective than a traditional lecture method in affecting lesson recall.

An experiment was constructed to test the hypothesis that college students who receive instruction in a storytelling fashion will not demonstrate greater recall of instructional material than students who receive the same instruction in a more traditional lecture method.

As this chapter will recount, research has discerned that mnemonics have long been used as aids to recall. Since storytelling innately shares many common characteristics with mnemonics, it may be considered a "natural mnemonic." Consequently, the literature was explored with the question in mind, "Are the same qualities that affect recall found in the study of memory in general and mnemonics in particular also present in storytelling?"

The following literature search has five focal points. First, storytelling as a teaching method is examined. Second, research in the field of memory and/or recall is examined. Factors known to facilitate recall are explicated here. Third, an inquiry is made into what is known about characteristics of mnemonics that influence recall. Qualities common to both mnemonics and storytelling are then reviewed, followed by an explanation of a mnemonic method of instruction known as the Story Form.

Storytelling as a Teaching Method

In many educational circles, storytelling has been called the "Ancient New Art." (Nietzke, 1988) It is ancient, since at one time almost all teachers were storytellers. Before writing and later printing, storytelling was the major means by which people were educated, and many of the most distinguished teachers in history were known for their storytelling (Jackson, 1986; Common, 1991).   Paleontologist Richard Leakey (1978) went so far as to suggest that storytelling organized human society. The narrating of stories drew people together and organized them through their sharing of perceptions.

For centuries, the stories of Homer formed the only literary content of education among the Greeks. In Roman education, stories of national heroes and statesmen such as are found in Plutarch's *Lives* formed an important part of the curriculum. A glance at the Old Testament tells how largely Hebrew life and culture was shaped by stories. Jewish Rabbis liked to teach by telling stories, using word plays and associations of thoughts to argue rather than drawing intellectual conclusions. The mere mention of the first sentence of a well-known Biblical passage or folk-tale was sufficient for them to recall that particular narration. This style of teaching was labeled *Midrash*, a Hebrew word taken from the verb *darash* which means "to research" or "to investigate." It is a commentary on a biblical passage in the form of a story. Throughout Christian history, the parable has been a popular teaching device. It was brought to its finest expression in the teachings of Jesus. Matthew, one of Jesus' biographers, wrote that at one time in Jesus' ministry, the parable was his only method of speaking to the masses that came to listen to him (Matthew 13:34).

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Since teaching has traditionally been a matter of comparing the known with the unknown, the strange with the familiar, virtually all disciplines at some point have resorted to story, imagery, or metaphor to convey information. Mcfague's (1982) observations here, though referring to the sciences, have applications in other disciplines as well:

> When we turn to the sciences, whether mathematics or the natural or social sciences, *we also find metaphor to be central* (emphasis mine). Perhaps it is most surprising to those who suppose that metaphor belongs only in the arts and religion to discover it at the most basic level in mathematics: the numerical analogue. Seeing the similar number among otherwise disparate entities is a metaphorical act, as in six apples, six moons, six ideas, six generous acts. In the social sciences the ubiquity of metaphor is obvious: the human being has been seen as child of God, as half-angel and half-beast, as a machine; the state has been viewed an an organism and a mechanism; the brain has been understood through the metaphor of the computer and vice versa. When one turns to physics, the evidence for the importance of metaphor in the form of models is extensive. . .Jacob Bronowski speaks for many philosophers of science when he insists that ideas in science, as in any other field, are derived from images.

Storytelling is "New" as well as "Ancient," since in recent years it has experienced a revival in the American Culture (Manuel, 1981). Social Scientists have recently expressed a renewed interest in stories, or narratives. Several works reflect this interest, including Bruner's (1986) *Actual Minds, Possible Worlds,* Polkinghorne's (1988) *Narrative Knowing and the Human Sciences,* and Sarbin's(1986) *Narrative Psychology: The Storied Nature of Human Conduct.*

Educational researchers have also begun to investigate the benefits of storytelling (Connelly and Clandinin, 1990; Elbaz, 1981; McEwan, 1990), and a growing number of educators have been finding that teaching *with* stories is a powerful instructional strategy, with the ability to make many areas of the

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curriculum alive and challenging. Farnsworth (1981) called storytelling a "generous art." Stories "stimulate imagination and a sense of wonder, inspire creativity, and help develop a sense of humor. Too general? They also motivate and reinforce basic reading and writing skills, help children understand sequencing, build vocabulary, reinforce concepts,and foster the arts of communication both spoken and written." Lynn Rubright, Professional Storyteller and Educational Consultant, commented that "Once a story is told in a somewhat artful way, it becomes a living experience in students' minds. It can then be used to teach all kinds of specific things such as math, language arts, social studies, movement, music and dramatics." (Medina, 1986) Other educators have reported teaching a host of subjects with stories, including Drama (Verriour, 1990), Social Studies (Barr, 1993), Math (Borasi, 1990, Small, 1990), Language and Literacy Development (Peck, 1989), Science (Martin, 1988), Reading and Writing (Roney, 1993), History (Gundlatch, 1986; Hickman, 1990), Oral Communication (Cooper, 1989), Listening Comprehension (Dwyer, 1989), Values and Attitudes (Hensel, 1992; Coles, 1989), Multicultural Concerns (Zabel, 1991), Creative Writing (Warawa, 1989), Moral Development (Vitz, 1990; Smith, 1993), Overcoming fears (Barclay. 1992) and Self Esteem (Olbert, 1993).

Memory and/or Recall

According to Hunter (1967), studies concerning the nature and workings of human memory contain literally mountains of data, innumerable unanswered questions, some sophisticated hunches, and a few valid principles. The purpose of this project has been to search out and distill these findings in order to arrive at the principles.   After a brief overview of memory and how it

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functions, these principles will be explored. For a fuller treatment of the history of memory and memory studies, the reader is referred to Gomulcki (1953) and Yates(1966); and more recent studies of various aspects of memory may be reviewed in Gruneberg and Morris (1992).

Stages of Memory

Remembering is generally viewed as consisting of three stages: *Acquisition* or *Encoding* is learning the material in the first place. *Storage* is keeping the material until it is needed, and *Retrieval* is finding the material and getting it back out when it is needed (Higbee, 1988). These three stages are interdependent and interrelated. It is common knowledge that more can be stored in memory than can be retrieved, and most problems in memory exist at the retrieval stage than at the other two. Retrieval is affected, however, by how material is recorded and retained. For this reason, improved methods of recording and retaining will improve retrieval.

Processes of Memory

Although there are many different models of memory, conventionally researchers have viewed memory as containing two basic yet different processes. These processes are *short-term memory* (also called *primary memory* and *working memory*) and *long-term memory* (also called *secondary memory*) (Higbee,1988). Short-term memory has been called a person's working memory because it is the system used to remember information that has to be recalled, or responded to within a few seconds or minutes after receiving it. For example, if you look up a telephone number you have to be able to remember it long enough to dial it, or if you get a dental appointment, you must remember it long enough to write it down. Short-term memory is subject to rapid information loss. Information stored there is generally forgotten in

less than thirty seconds. In order to retain information held here, it must be continually rehearsed. Interference from other sources has the ability to hamper its effectiveness. For example, if someone calls out numbers while you are trying to remember and dial a new telephone number, very often you will forget the number and need to look it up again.   Short-term memory is also limited in the number of items it can retain through its rehearsal process. For some inexplicable reason we are unable to rehearse more than seven individual items of information. Most people are unable, even with practice, to remember eight or nine numbers in a row. This limitation can be overcome, however, through use of a process called "chunking" which will be discussed later.

If information is kept in short-term memory long enough, it can be transferred into long-term memory. Long-term memory is memory of information we heard or saw minutes, hours, days, weeks, or even years before we were called upon to retrieve it. Obviously, this is not material one has been rehearsing since it was received. Students of long-term memory believe that there are several types of it. One view is that there are at least three categories of long-term memory. They are *procedural memory* which involves remember-ing how to perform various skills, such as typing; *semantic memory,* which involves remembering factual information, such as math equations or word meanings; and *episodic memory ,*which involves remembering personal events, such as your wedding day.

Unlike short-term memory, long- term memory is not limited in the number of items it can receive and retain. All of us actually have more capacity to store information in long-term memory than we will ever need to use. In fact, it is believed that the *more* information there is in long-term memory, the easier, not harder, it is to get more information in, because the more you know, the

more complete your organizational system must be and the faster you can catalogue new information (Norman, 1970).

Short-and long-term memory cooperate with and complement each other. We are constantly being bombarded with information from many sources. Our senses are seldom quiet. All of the available information passes into our short term memory system, but most of it falls away in less than a second. However, information that interests us becomes the focus of our attention and comes up for further contemplation. Whenever we deem an item worth remembering, we snatch it up for further analysis. At this point it is recirculated until it is either used , discarded, or placed into long term memory. The length of residence of such items in short term memory depends on how fast we respond to them or whether or not we make sense of and organize them into long term memory. Some information makes sense almost immediately, and consequently it goes rather quickly into long term memory. But some information takes time before it can be understood and well integrated into long term memory. What follows is a discussion of those factors known to facilitate the moving of a stimulus into residence in long term memory.

Factors Facilitating the Retention of Information

The key word in the title of this section is "facilitating.". It is unrealistic to suppose that any one factor will "guarantee" retention. There is no known way to ensure perfect, permanent retention. Each factor is dependent upon a number of other factors that will either assist in promoting memory, or interfere and result in forgetting. While factors may be explained individually , it must always be rememembered that they are operating together and interacting

constantly.

The available literature reveals at least seven known factors that aid in retention. They are attention, meaningfulness, organization, visualization, association, repetition, and feeling tone.

Attention

Virtually all memory begins with attention. We remember very little material to which we pay no attention. The role attention plays during early stages of memory makes it one of the most important factors in determining recall. Some of the biggest improvements in memory can be seen to occur after attention is in a person's control.   Research has found that attention to learning tasks correlates more highly with school achievement than does amount of time spent on the task (Wittrock, 1986).

Attention is a great deal like the channel selector on a television, in that an individual can only watch one station at a time. Consequently, it is easy to miss what is going on simultaneously on the other stations. We may try to flip to another station to catch what is going on on both stations, place more than one television in the room, or purchase a monitor with an insert screen. At any one point in time, though, we focus our attention on only one station. Likewise, we can only attend to one source of stimulation at a time. Every day there are many programs to choose from, so to speak, since many events, people, and other stimuli compete for our attention. What determines which stimuli catch our attention? There are basically two determinants.

The first factor has to do with the *nature of the stimuli.* Some stimuli can force themselves upon our attention because of their particular characteristics. Broadbent (1958) suggested that there is a filtering process at the entrance to the nervous system. Only stimuli that meet certain requirements are allowed

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through that filter. One type of information that will draw our attention is that which has some form of intensity, in the form of color, brightness, or sudden stops or starts. Advertisers use such characteristics to get us to pay attention to their products. As a result, there are bright lights, glowing colors, catchy phrases, loud noises, and movement in their displays. The principle here is that deviation from the normal attracts our attention. The knowledge of this principle dates as far back as the ancient Greeks. A standard work emphasizing memory was *Rhetorica ad Herennium.*. It advocated the novel to catch listener's attention:

> "When we see in everyday life things that are pretty, ordinary, and banal, we generally fail to remember them because the mind is not being stirred by anything novel or marvelous. But if we see or hear something exceptionally base, dishonorable, unusual, great, unbelievable, or ridiculous, that we are likely to remember for a long time. Accordingly, things immediate to our eye or ear we commonly forget; incidents of our childhood we often remember best. Nor could this be so for any other reason than that ordinary things easily slip from the memory, while the striking and the novel stay longer in the mind." (H. Caplan, 1954)

The second factor that determines what an individual will attend to involves *conscious decisions* to attend or not to attend to information. We can choose to focus our attention on something and can effectively block out other stimuli that are competing for our attention. Therefore, if we merely determine to focus our attention on a stimulus, the possibility that we will remember that stimulus is greatly enhanced.

Brain-wave research conducted by Dr. Hans Berger and others indicated that we are likely to loaf along with only moderate attentiveness until motivated by some challenge, special interest, goal, or ambition. But we can increase *voluntarily* our reactivity to a worthwhile extent. As we increase our reactivity,

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the brain waves and brain cell activity shift in step, and the nervous system is turned up to be better able to make traces of new impressions or to revive the traces of older impressions we want to recall (Laird, 56).

A demonstration made by Dr. James H. Moore showed the usefulness of merely trying to remember. In an experiment in which he read to two groups the same story, one group was asked to try to remember as much of it as possible. The group not told to try could recall on the average only seven of the ideas in the story, while the group told to try recalled an average of fifty-one of the ideas in the story (Laird, 30,31). Consequently, one of the most important factors yet discovered for memory enhancement is the simple effort to try to remember.

<center>*Meaningfulness*</center>

Psychology has long known that meaningful material is much more rapidly memorized than meaningless material (Meredith, 65). We are likely to select from current stimuli those things that interest us, which have relevance to our long-standing concerns, aims, and aspirations, and those things which are likely to be of future use to us. Consider the following three lists of material: (1) TAS-YAL-DOP-SIW-MEL-YOS-HIW-LON-MAF-GIW-NAL-WOH; (2)WAS-TIN-LAY-WHY-OLD-WOE-NIL-LOW-HAM-FIG-MOSS-PA; (3) WE-ALL-SAW-A-TINY-GOLDFISH-WHO-SWAM-IN-MY-POOL. No great amount of experimental investigation is required to tell us that these lists would not be equally easy to learn. We would have to read through the first list several times before we could recall it. The second list would be recalled after a smaller number of readings, while the third list could be recalled after no more than two readings. Each list is made up of exactly the same letters. Why would they not be equally easy to memorize? The answer is obvious. The second list is easier than the first because it contains familiar, though unrelated words. The third list is easier

still because it has familiar words which, in addition, occur in a sequence that makes sense and therefore contains some meaning (adapted from Hunter, 11). The principle here is: the more meaningful the material, the better the retention. Higbee (1988,46) observed that the alternative to meaningful learning is learning by "rote." Rote memory refers to trying to remember something without doing anything to make it meaningful. At all levels, meaning affects memory. Words are easier to remember than nonsense syllables. Concrete words are easier to remember than abstract words. Words grouped into meaningful categories are easier to remember than words given in meaningless order. Sentences are easier to remember than words in random order, and well organized paragraphs and stories are easier to remember than disorganized ones (Higbee, 46). If some sort of logical relationships between items is emphasized, then better recall can occur. Bower and others (1969) showed that when apparently unrelated words were restructured so that they fell into a hierarchical classification, the words could be learned four times as quickly.

In another study illustrating the effect of meaning, subjects memorized a list of two hundred nonsense syllables, a two hundred word prose passage, and two hundred words of poetry. The nonsense syllables took about one and a half hours to memorize; the prose took less than one half hour, and the poetry took about ten minutes (Lyon, 1914).

Gagne and others (1985) had Middle School students learn paragraphs on topics of high or moderate familiarity. The students were tested for recall either several minutes or four weeks after learning. Results showed that the element of meaningfulness increased the amount recalled. This result is connected with the notion (See Ausbell, 1969; Anderson and Rider, 1979) that learners confronting more meaningful material find it easier to form more

structured and elaborate traces because the existing related knowledge provides an "ideational scaffolding" for new information, and this scaffolding leads to more stable, more permanent, and more distinctive transfer.

Organization

Generally speaking, material is not easily retained unless it has some structure. It is generally believed that material is organized in long-term memory so that we do not need to search our entire memories in order to find specific information (McCloskey & Bigler, 1980). All of our lives we have been learning about various subjects, and all of this information has been organized into a network that permits us to progress from remembering one piece of information to another. If such organization did not exist, our memory would be a hodgepodge of unrelated events and we would have to search every thing every time we wanted to remember anything.

To demonstrate this to yourself, try to see if you can remember your grade school teachers' names from the first to the sixth grade. As you can see, you do not have to sort through your relatives' names, baseball players' names, or movie stars' names to find teachers' names. This is because they are organized into their own networks which do not get searched every time you search for a teacher's name. If anything is likely to interfere with your recall of a particular teacher's name, it is another teacher's name, precisely because they are organized together (Adapted from Cermak, 48).

Research has shown that presenting information organized into categories helps in remembering the information (Folarin, 1981; Marson & McDaniel, 1981). Organized paragraphs are recalled better than unorganized ones, and stories that are organized sequentially (with one event leading to another) are remembered better than stories that jump around from one point to

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another (Black & Bern, 1981). Tulvey and Pearlstone (1966) found that material placed in categories and organized was remembered more effectively.   Memory has even been shown to be helped when items are not organized, but subjects are told categories into which the items *could* be organized (Strand, 1974). Mandler (1967) discovered that when subjects were instructed to sort words into categories, with no instructions to learn them, that they were able to retain those words just as well as subjects who were instructed to learn them.

The attribute of organization can actually be *imposed* on material to provide greater memory enhancement. One of the best known cases of this practice is that of advanced organizers. Ausbel (1960) who popularized this idea, maintained that presenting information to the learner before a learning event will improve retention by providing an "anchoring idea" into which the more detailed information in the lesson could fit.   The principle here is: anything that needs to be remembered in the future should be organized when presented.

In order to organize information, it is sometimes necessary to use some pre-established system, much like the library's card catalogue. One of the most primitive of these systems is called *chunking ,* or grouping. In his classic paper *The Magic Number Seven, Plus or Minus One* , Miller (1956) showed that memory span was determined by the number of "chunks" rather than the number of items, averaging about seven items per chunk. A chunk is an integrated piece of information where remembering part of it will help you remember the rest.

There are basically two types of chunking. The first is that of grouping items on the basis of the *order* in which they occur. For example, it is easier to remember a list of numbers such as 7,4,9,5,1,6,8,3,9 by chunking them into the

three groups of 749, 516, and 839.

A second type of chunking is done on the basis of *relationships* within the material itself. For example, in order to remember a grocery list with the following items: milk, napkins, cokes, salami, ham, paper plates, lemonade, paper cups, and bologna it is suggested that they be organized by relationships- -milk, lemonade and cokes; salami, ham and bologna; and napkins, paper plates and cups. The first category contains drinks, the second, meats, and the third, paper products.

The primary function of organization is to provide a means for the optimal level of storing and retrieving of new information (Cermak, 48). Another means of organizing material is the use of *mnemonics,* which will be discussed later.

Visualization

Memory is generally more visual than verbal. Research evidence from as far back as the 1800's indicates that visual imagery improves memory for verbal material (Higbee, 57). Much of the research conducted since the mid 1960's on imagery and its effectiveness has been summarized in several books (Fleming & Hutton, 1983; Morris & Hampson, 1983; Richardson, 1980; Sheikh& Sheikh, 1985; Yuille, 1983).

Visualization of verbal material does not refer to picturing the words themselves, but picturing the objects, events or ideas the words represent. In studies examining various attributes of words and how a person's learning of words varies with these attributes, Paivio (1971, 1972) found that the vividness of the imagery a word arouses is the most powerful predictor of the word's memorability.

Association

Association , sometimes referred to as *positive transfer*, occurs whenever

learnings in one's past experience helps to remember something in the present. It refers to relating the unknown to the known. This can be done with analogies, metaphors, examples, and by comparing and contrasting. It is also often called *linking.* The principle here is that in order to remember a new item, it is associated to something one already knows.

The music student takes advantage of this technique when he learns the unfamiliar lines on the treble clef (e,g,b,d,f) by saying the familiar "every good boy does fine." Many students have no trouble remembering the shape of Italy, while they cannot remember the shapes of other European countries because they were shown that Italy (unfamiliar) is shaped like a boot (familiar). Research has shown that remembering is improved when teachers help students relate information to be learned to what they already know (Brophy, 1986). The more similar learnings are, the easier it appears to be to associate them. For example, it would be easier for a violinist to learn to play the cello than for a pianist to learn the same, because the skills involved in playing the violin and cello are more similar. In one series of studies on recall, the most noteworthy finding was a positive relationship between familiarity with old information and remembering new information (Franklin, 1985). Association most likely helps to make material more meaningful. In research on learning, the meaningfulness of a word frequently has been defined in terms of the number of associations it has (Reigeluth, 1983).

Repetition

Many researchers think that reviewing or repeating information with a view to memorization actually does more toward maintaining that information than any other single factor (Cermak, 115). In 1885, when Ebbinghaus published his book on memory, he established what he called *laws of forgetting*

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that can be summarized as follows: (1) Reproduction deteriorates with time; (2) The rate of forgetting is very rapid in the early stages; (3) The curve of forgetting can be expressed by a mathematical formula. It is a negatively accelerated logarithmic curve; (4) *Forgetting is less rapid if the number of repetitions used in learning is increased* (emphasis mine). Norman and Waugh found that the likelihood that an item will be recalled increases with the amount of time available for its rehearsal (1965). Spitzer (in Laird, 96) discovered that when recitation (a form of repetition) was combined with reading, subjects recalled four times as much two weeks after the reading. Some laboratory checks have shown that merely repeating once in one's own voice what one has heard can increase the amount remembered from twenty five to one hundred percent (Fleming,1963).

It may well be that what actually goes on in repetition is that the learner is processing and organizing information, and this *organization* is what causes memories to occur. Mandler (1968) holds this view. He states "Repetition... permits the subject to lay down initial categories and fit items into them." He claimed that repetition was only a "descriptive term" for organization (117).

Feeling Tone

An examination of the literature relating to memory enhancement reveals that there are basically two types of facilitation. These two types are: the optimization of memory processing (such as through various types of instruction), and the optimization of non-memory factors that influence memory processing (such as physical and emotional states.) Memory performance may be affected by a person's physical or emotional state, environmental condition, or social environment (for a more detailed discussion of these factors, see Gruneberg and Morris,1992, pp. 156-61).

The amount of attention a stimulus receives may be affected by what is called *Feeling Tone.* Feeling tone refers to the emotional content of material, as well as how the material is presented. Some researchers have found that retrieval may be facilitated by trying to create the mood experienced during encoding (Bower, 1981; Singer and Salovey, 1988).

It is well established that people remember pleasant experiences better than unpleasant ones (Matlin and Stang, 1978). Unpleasant experiences are remembered, although we may try to eliminate them from memory by repressing them. One theory of forgetting is called the *Repression Theory*, which holds that any anxiety-producing or unpleasant experience will be less likely to be recalled. We have a hard time remembering those things that have little or no feeling associated with them. According to Laird (136), emotionally tinged attitudes which lower recall are:

anxiety	embarrassment	Inferiority feelings
apprehension	frustration	injured pride
confusion	grief	lack of confidence
depression	hatred	stage fright
displeasure	feeling ill at ease	shame

Broadbent, et.al (1982) found that memory performance may be impaired by stress, and Yesavage, et.al. (1982) claimed that relaxation training yielded improvements in memory performance comparable to that produced by memory training.

Mnemonics

A mnemonic is a technique or system to improve or aid the memory, usually by the use of some formula. Mnemonics have a long history, dating back at least as far as 2500 years ago when Cicero wrote *De oratore* for students of rhetoric who, when giving long speeches, could not refer to notes. These students were taught to imagine a large, familiar building with many rooms. They were to mentally walk through these rooms as they delivered their speech and in certain locations "see" an object which was to remind them of their next idea or point as they spoke. This mnemonic was called *loci*, and it was often coupled with another one called *imagines* or images. Students here were instructed how to transform their words and ideas into mental images, usually of dramatic or unusual situations. These vivid pictures or series of images would act as memory cues (Norman, 1966). For additional information concerning the history and usage of mnemonics, see Mastropiere and Scruggs, 1989 and 1992.

With the advent of literacy, the need for memorization was no longer a required skill and mnemonics were not taught regularly. In more recent history, however, renewed interest in their potential has emerged. It has been demonstrated that by teaching students to use mnemonic techniques similar to those developed by ancient Greek and Roman teachers, retention of material can be improved. A study by Bower (1973) showed that mnemonic techniques were far more effective than simple rehearsal for remembering long lists of items. Students were asked to study five successive lists of twenty unrelated words. At the end of the session, they were asked to recall all 100 items. Subjects using mnemonic devices remembered an average of 72 items, while

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the group using simple rehearsal remembered only 28. The subjects trained in mnemonic techniques were also much more successful at recalling the position of each item and the list on which it appeared.

Experiments using mnemonic techniques have been conducted in various fields. Foreign language vocabulary (Raugh and Atkinson, 1975) and capitals of states and countries (Levin, Shriberg, Miller, McCormick, and Levin, 1980) have been taught using mnemonics. Scruggs and Mastropieri (1989, 1990) have had significant success in applying mnemonic instruction with students with mild disabilities. Results of their studies suggested that mnemonic instruction resulted in substantial increases in initial content acquisition, and substantially higher delayed-recall scores, over more traditional instructional methods (Scruggs and Mastropieri, 1992). Working with other researchers, Mastropieri and Scruggs have shown that mnemonic instruction can be used to learn abstract as well as concrete information, and that it has a facilitative effect on comprehension as well as recall (Mastropieri, Scruggs, & Fulk, 1990; Scruggs, Mastropieri, McLoone, Levin, & Morrison, 1987; Pressley, Levin and Delaney, 1982).

Among the different types of mnemonic techniques, two have been empirically tested. They are the *keyword* and *pegword* techniques. The key-word technique was developed by Atkinson (1975) and furthered by Raugh (1975) to test vocabulary retention by subjects learning Spanish and Russian vocabulary. In foreign language teaching this mnemonic is the most frequently tested of all known memory aids. The keyword mnemonic is based on the observation that cognates or other orthographically similar words from one's native language can act as verbal mediators between the written representation

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of a word and its target language pronunciation. For example, students of German can use *flesh* in English to mediate between the German word *Fleisch* and its specific English translation *meat.*

Added to the acoustic link in the keyword technique is an image link to further strengthen the memory. The image tends to be a novel one, making it more memorable. For example, given the word *pere* in French, students can imagine a *father* eating a pear, or *father* having a pear shaped body.

In the *pegword* technique, the student first learns a list of rhyming peg words, pairing images with the first twenty or so integers (for example: one is a bun, two is a shoe, three is a tree, etc.) The learner then uses the peg words as imagined pegs upon which to hook items to be remembered. Normally, practitioners of this method encourage elaborate or bizarre mental images in hooking items to their successive pegs.

Other mnemonic techniques include *rhymes,* or *metrical mnemonics* (as in "Thirty days hath September, April, June, and November," etc.); *Loci* (similar to the pegword system, but here items to be learned are visualized in different physical locations);and *Successive-comparisons* (also called *Linking* . Here, items to be remembered are "linked" together in a chain, one item relating to the previous one, often in some sort of ridiculous, vivid, or exaggerated manner).

The reason that mnemonics have been demonstrated to be effective in aiding memory is because of what they accomplish. Basically, all mnemonic systems teach the user to *pay attention,* to *organize* the material to be learned, usually by *linking* or attaching it to some previously learned organizational scheme (Mastropieri, 1989). Within this process, information is normally broken into *smaller, simpler parts*, and an attempt is made to use imaginative, concrete,

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visual images that convey some *meaning to the user* (Siwolop, 1983; Norman, 1969).

Mnemonics and Factors that Aid Recall

Higbee (1988) claimed that mnemonics make use of all of the basic principles of memory and learning mentioned above.

Attention: Mnemonic systems force the user to concentrate on the material in order to form pictures and associate them.

Meaningfulness: The main function of most mnemonics is to impose meaning on material that is not inherently meaningful through the use of rhymes, associations, and patterns.

Organization: Most mnemonic techniques impose some meaningful organization on the material to be learned. They provide a systematic way to record and retrieve the material.

Association: Association is basic to all mnemonic systems. In the link system the items are associated with each other. In the Pegword system easily memorized material memorized earlier serves as a filing system for new material.

Visualization: Associations are normally made visually in mnemonic systems.

Repetition: Although mnemonic systems frequently take fewer repetitions, because they provide a way to organize the material to be learned, they do provide an easier way to rehearse the material .

Feeling Tone: Mnemonics tend to be generally more whimsical, interesting, and fun than rote learning of material.

The point here is that mnemonic systems do not *replace* the basic

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principles of learning but rather *use* them.

Storytelling As A Mnemonic

Researchers have discovered that stories possess the power to positively affect recall. Berhowitz and Taylor (1981) conducted a study of readers in the sixth grade comparing their memory of expository and narrative passages. The children recalled significantly more information from the narrative passages than they did from the expository passage having a similar content. Hilton (1979) postulated that stories enhanced human capability for memory by providing "containers" for organizing events and information into meaningful experiences. The more stories one has, the more containers, and consequently the more potential for recall. Egan (1992) claimed that the reason so much of the lore of peoples was contained in myths was that due to "What myth-users knew long ago--that we can remember a set of events plotted into a story much better than we can remember lists or sets of explicit directions. He believed that a simple social need was met by the creation of imaginative myths: the need to remember. In oral cultures the myths contained the lore that bound the society together, and this lore was important to remember.

A view that is becoming more and more widely accepted is that the mind works in a storytelling fashion (Bretherton, 1984; Hardy, 1977; Sutton-Smith, 1988). Mental processes are being thought of a grounded in and growing out of narrative and metaphoric bases (Lakorr and Johnson, 1980; Langer, 1982; Kolakowski, 1989). Rosen (1986) commented that the brain is essentially a storytelling device. It runs on stories, and the knowledge that we store in the brain is largely in the form of stories. Smith (1988) asserted that thinking

"thrives on stories," on the construction of and exploration of patterns of events and ideas. Livo(1986) similarly declared that the brain takes even isolated and unconnected pieces of human experience and "sews them together" into something that is complete and has meaning. Consequently, how we know and remember information is involved in the patterning that is story, which is a way of organizing thought and placing it into language. Schank (1990) maintained that with the exception of certain questions and some straightforward and factual answers, such as "What room is Jones in?" followed by "1244," everything people say regarding their opinions or experiences is a story of some sort (218). Hardy (1968) concurs: "We dream in narrative, remember, anticipate, hope, despair, believe, doubt, plan, revise, criticize, construct, gossip, learn, hate, and live by narrative."

One reason that stories appear to be so memory-compatible could be that they naturally appear to perform many if not all of the tasks that are performed by mnemonics. As was noted earlier, all mnemonic systems teach the user to *pay attention,* to *organize* the material to be learned, usually by *linking* it to some previously learned organizational scheme (Mastropieri, 1989). In this process, information is normally broken into simpler parts, and an attempt is made to use imaginative, concrete, visual images that convey some meaning to the user (Siwolop, 1983). Stories invite attention. Researchers have frequently observed heightened interest among students exposed to storytelling (Hamilton, 1991; Nietzke, 1988). Cliatt (1988) and Leonard (1990) both reported heightened engagement, more active participation, and more positive attitudes among learners exposed to storytelling. Hamilton (1991) noted that storytelling had a beneficial effect on the *development* of attention skills.

When a storytelling approach has been taken with various subjects,

inevitably teachers have reported *increased student interest.* Martin and Miller (1988) developed a storytelling method of teaching science. The observed that most science textbooks were static, linear, and non-participatory, offering no connections between observer and observed. They discovered and consequently argued that presenting scientific materials in narrative formats made them *more interesting* and consequently more easily remembered. Ferdinald (1987) made a similar discovery with college-level psychology instruction. His conviction was that undergraduates preferred the narrative mode, and that the organization imposed by a storytelling structure might become a key factor in learning and retention. Scott (1985) concluded that since storytelling had such a positive effect on interest it could serve as the "most painless" way of teaching children to listen, to concentrate, and to follow the thread and logic of an argument. Egan (1987) had such confidence in the power of storytelling to capture the interest that he claimed that the elements that make stories engaging could be used to teach *any subject at any level.*

Stories create *meaning* : One goal implicit in storytelling is that of constructing meaning through the use of language (Nelson,1989: Schwartz, 1987). Research conducted by the U.S. Department of Education (1986) concluded that "storying," or the process of constructing stories in the mind, is one of the most fundamental ways of making meaning, and thus it pervades all aspects of learning. Wells (1986) claimed that it was generally accepted that young children find it easier to assimilate new ideas when they are presented in the form of a story. He also believed that even older students find that illustrative anecdotes make general principles easier to grasp and that as students of all ages encounter new ideas it is helpful to illustrate these ideas with stories. Stories then provide a major route to understanding .

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Freedland (1987) observed that in storytelling situations children take part in an art that is involved with perceiving relationships, causes and results. Nelson (1989) agreed, and noted that storytelling could enhance both literal and inferential comprehension, increase perceptual knowledge of metaphor, and instill deeper meaning. Reece (1977) stated that the mental images supplied by a story could enhance meaning, and Dwyer (1989) called the story a "natural framework for comprehension. Mims (in Kleen, 1992) maintained that storytelling has to do with representing reality and making cognitive links. It thus enables us to get hold of difficult ideas. She wrote, "It goes far beyond the aesthetic. It is a means through which children make sense of the world."

Stories contain *organization:* Since stories are narratives that recount sequences of events, they naturally possess organization. Livo (1986) remarked that while individual stories may have different patterns or shapes, yet each is a subpattern of the overall structure that is recognized as story. Higgins (1970) wrote that "a story well told is perhaps the best model of organization that a child can find amidst the confusion of the apprehensible world."

Schank (1990) contended that the process of story creation is in itself an organizational or "chunking" process. If we are recounting information to others, we first break down our experience into a story size chunk that can be told in a reasonable amount of time. We are formulating the "gist" of the experience, and placing the episodes of the information into smaller chunks that fit together to us in a coherent fashion. This process of creating a story also creates a structure in our memory that will contain the gist of the story for the rest of our lives. Reece (1985) told students to try to recall what they had learned as children, and observed that they all appeared to go through a similar process, e.g., they

pulled the images they recalled most vividly and arranged them in sequential order. Mandler's (1984) studies indicated that there is a story schema embedded in our minds and, with time, new information becomes more dependent upon and organized around this schema.

Stories facilitate *repetition:* Raines and Isbell (1994) believed that the primary reason legends and myths were preserved was that they were couched in stories that could be told over and over again. The telling and retelling of the stories served as a natural agent of repetition.

Feeling Tone: Egan (1992) observed that the amount of lore or "information" contained in the myths of peoples is quite considerable. He argued that the mores, customs, etc. of societies were encoded in stories instead of presented in lists for two reasons: first, they would be very hard to remember, and second, they would not attract people's *emotional* commitment to them. He pointed out that the great power of the story is that it engages us *affectively* as well as requiring our cognitive attention; we learn the content of the story while we are emotionally engaged by its characters or events.

The Story System

One type of mnemonic linking has been labeled the *Story System.* In the Story System a story is formed based on the items desired to be remembered. For example, you might use something like the following for a five item list (paperboy, tire, doctor, rose, ball): The *paperboy* rolled a tire down the sidewalk, and it hit the *doctor* coming to make a house call; it knocked him into a *rose* bush, where he picked up a *ball* and threw it at the boy. The procedure for recalling items learned this way is to begin with the first item and proceed through the story, picking the key words out as you come to them.

To date the Story System has been utilized mainly to remember word

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lists. Research has shown that people using this system to learn a dozen or more lists of ten words remembered two to seven times as many words as did people not using the system (Higbee, 1988, 136). It has also been found that the Story System could be used effectively on abstract words, although not quite as effectively as on concrete words), and even that sentences strung together as stories were remembered better than when they were presented as unrelated sentences (Higbee, 1976).

While researchers have *acknowledged* stories and systems like the story system to positively affect recall, few researchers have actually experimentally tested such methods. James and Roth (1984) discovered that when asked to construct from memory the spatial layout of a large scale area, kindergartners and third graders placed objects more accurately when they had been presented a story connecting the objects. George and Schaer (1986) attempted to determine the most effective imagery method for facilitating kindergarten children's recall of prose content. They investigated the effects of three mediums for presenting literature to children: storytelling, television and dramatization. Results indicated that dramatization and storytelling were significantly more effective in facilitating recall than was television. James and Roth (1984) discovered that when asked to construct from memory the spatial layout of a large scale area, kindergartners and third graders placed objects more accurately when they had been presented a story connecting the objects. The most involved study to date relating storytelling and recall was conducted by Farrell (1982). This study was based on the Word Weaving Program, a year-long experimental storytelling program. Teachers were trained in storytelling techniques, and students exposed to storytelling outperformed controls in four variables that were tested: fluency, vocabulary, descriptive language and recall.

Many instructors are currently investigating the use of storytelling as an instructional strategy, and more and more articles are being published recounting teacher satisfaction with this medium in the classroom. Most of what is being written, however, is anecdotal and evangelistic , rather than experimentally based. With the exception of the aforementioned studies, little actual research testing storytelling as a method to affect recall has been done. In addition, contemporary research testing the effectiveness of storytelling with students taking college level work has not been conducted .

Summary

The preceding literature search concerned itself with five subjects: storytelling as a teaching method, recall and factors known to influence it, the role of mnemonics in affecting recall, the qualities that storytelling and mnemonics hold in common, and the story system of instruction. The information could be summarized in the following statements: Mnemonics contain characteristics that research has demonstrated to positively influence recall. Storytelling by its nature contains the same characteristics as mnemonics. Storytelling is therefore a "natural mnemonic," and it holds promise as a teaching method to positively influence recall. Methods such as the Story System may prove effective in producing lessons that will be more effectively remembered by students. but there is a need to experimentally test such methods. This study was one attempt to address this need.

The experiment described in the next chapter involved teaching college undergraduate students by embedding instruction in a story (a technique similar to the the Story System mnemonic).

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Chapter 3

Methods and Procedures

A commonly recognized problem in education is that students forget instruction. Good teaching concerns itself with methods that might positively affect student recall of instruction.

This study was designed to address the problem of student recall of instruction with a strategy involving storytelling as a teaching method. It was constructed to determine what if any effect storytelling as a method of teaching has on retention of information. More specifically, this experiment was conducted to determine if storytelling is more effective than a more traditional lecture method in affecting lesson recall.

The preceding pages contained a study of the literature concerning memory and/or recall and storytelling. This literature showed that one method of manipulating information for better memory is the *mnemonic*, a term designating a technique or system to aid the memory, usually by the use of some formula. Mnemonics actually arrange material based on the principles known to positively affect recall. The reason that mnemonics have been demonstrated to be effective in aiding memory is because of what they accomplish. Basically, all mnemonic systems teach the user to *pay attention,* to *organize* the material to be learned, usually by *linking* or attaching it to some previously learned organizational scheme. Within this process, information is normally broken into *smaller, simpler parts*, and an attempt is made to use imaginative, concrete, visual images that convey some *meaning to the user* .

As the literature search revealed, researchers have observed that stories

are something of a "natural" mnemonic, since they innately contain many of the qualities common to most mnemonics. As was presented earlier, stories possess at least six qualities common to mnemonics: they Influence attention; they create meaning; they organize material, they provide association, visualiza- tion and repetition, and they can create positive feeling tone.

The experiment described in the pages that follow was constructed to test the hypothesis that *college students who receive instruction in a storytelling fashion will not demonstrate greater recall of instructional material than students who receive the same instruction in a more traditional lecture method.*

Subjects

Subjects for this study were 114 undergraduate college students (32 males and 82 females) who registered for an Instructional Media and Technology course during the spring semester of 1994 at the University of Tennessee, Knoxville, Tennessee; Milligan College, Milligan College, Tennessee; and East Tennessee State University, Johnson City, Tennessee (Table 1).

Table 1

Overview of Students Participating in the Experiment

Location	Males	Females	Total
University of TN	21	63	84
Milligan College	6	13	19
ETSU	5	6	11
Combined	32	82	114

The largest number of participants were chosen from the University of Tennessee (84 students, comprised of 21 males and 63 females). Nineteen students participated from Milligan College (6 males and 13 females), and 11 students were from East Tennessee State University (5 males and 6 females).

One reason for the choice of college students as subjects was to demonstrate the validity and possibilities of this method for use with this particular age group. Storytelling is generally not perceived as being an effective tool for teaching college level or adult students. Much of the literature advocating storytelling in education was written from the perspective of and out of the experiences of educators dealing with children. A second reason for choosing this group was that a search of the literature revealed few experiments conducted with college aged students and storytelling methods of instruction. A genuine need exists to expand the research in this area. The third reason for choosing this group was that this is the group the experimenter was interested in and involved in teaching. The proximity and availability of college students for subjects was a matter of convenience as well as conviction of need.

A letter of consent was given in each of the classes from which subjects were chosen. The letter described the experiment, solicited student assent to participate, and assured students that neither they nor their grades would be harmed by their participation or non participation (a copy of this letter is found in Appendix A). After they had read and signed this letter, students were randomly selected for participation in either the experimental or control group by randomly drawing their names out of a hat.

Experimental Design

The experimental design chosen to test the hypothesis was the *Pretest-Posttest Control Group Design.* As described by Gay (1987), this design involves at least two groups, both of which were formed by random assignment. Both groups were administered a pretest of the dependent variable (in this case, the content of the ASSURE Model, a proceedural guide for incorporating media in instruction, described in the Curriculum and Instruction section of this chapter). One group then received a new, or unusual treatment (here, teaching in a storytelling fashion), while the other group served as a control (here, teaching with the traditional method.) Both groups were then posttested (The Pretest/ Postest may be seen in Appendix B). Posttest scores were compared to determine the effectiveness of the treatment. For two groups, this design may be illustrated in the following fashion:

R   O   X(1)   O   O   O

R   O   X(2)   O   O   O

R= Random selection

O= Pretest

X(1)= Treatment

X(2)= Control

O= Posttests

This design was chosen for its straightforwardness and simplicity. The before and after measures permit an investigator to study change, and it is often

referred to as the classical design for change experiments. The design also controls most of the variables that might affect an experiment. Random assignment controls for regression and selection factors; the pretest controls for mortality; randomization and the control group control for maturation; and the control group controls for history, testing and instrumentation. Testing, for example, is controlled because if pretesting leads to higher posttest scores, the advantage should be equal for both the experimental and control groups (Ary, Jacobs and Razavieh,1985). The only weakness attributed to this design is a possible interaction between the pretest and the treatment which may make the results generalizable only to other pretested groups. At least two factors minimize the possibility of such an occurrence in this study. First, the pretest was not novel or motivating and thus could be considered rather non-reactive. Second, the time between the first posttest and the final one (five weeks) tends to minimize the effect of the pretest. Interference is more likely to occur in shorter studies.

Curriculum and Instruction

Curriculum for the teaching sessions was the ASSURE Model, developed by Heinich, Molenda and Russell (1993). This model is a procedural guide for planning and conducting instruction that incorporates media. This model was chosen to be taught because it is normally included in the educational media courses at all of the institutions where the experiment was conducted, and because generally one class period is devoted to teaching its content to the class. The ASSURE Model is a procedural guide for planning and conducting instruction that incorporates media. It is designed to "Assure" the effective use of media in instruction. The term ASSURE is an acronym, with

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each letter standing for a step in the instructional planning process. "A" stands for "analyze the learners; "S," for "State the objectives;" "S," for"Select the media and methods;" "U," for "Utilization of media and methods;" "R"," for "Require learner participation," and "E," for "Evaluation." Teachers are encouraged to analyze their learners by looking first at their general characteristics (such as age, socio-economic status, etc), followed by examining their specific entry competencies (which relates to where students are in relation to the information to be taught). Stating objectives is advocated for strengthening teacher commu-nication, as well as providing a basis for selection of media and methods. Clear objectives are also presented as a tool for evaluation. In selecting media and methods, teachers are to either select from what is available, modify existing material, or design new media. Four steps are advocated in utilizing media: (1) preview the material; (2) practice using it; (3) prepare both the environment and the people you are instructing; and (4) present the material, using good show-manship. Students must then perform themselves, by doing whatever it is the instructor wants them to do. This is called requiring learner participation in this model. Finally, each session is to be followed by evaluation, in which the instructor evaluates student response to the teaching, himself or herself, and the media and methods for their effectiveness and/or revision.

At all three schools both the treatment and control groups were taught for the same amount of time in each teaching session (20 minutes), and both control and treatment groups were taught by four instructors. Two instructors were trained in a traditional, lecture method, and two in storytelling. The instructors were chosen because of their availability, willingness to participate, and proximity to the sites of the experiment. One set of instructors (a lecturer and a storyteller) taught students at the University of Tennessee, and a second

set taught at Milligan College and East Tennessee State University. In both the experimental and control groups, instructors were given a verbal and written briefing of the information to be taught. A verbal explanation was given during the initial contact of the instructors, followed by a second 20 minute verbal explanation in which questions could be asked. In order to assure as much similarity as possible with the lesson content each group received, a lesson script was prepared for the instructor of both the control and experimental groups which contained the elements of the instruction marked for testing . Since the posttests of the information contained eighteen particular elements to be tested for recall, instructors were directed to include those elements in their presentations(A detailed account of the directions for instructors and a copy of the tests is found in Appendices C and D). These written directions were given to all instructors at least one week before they were to teach the classes. Instructor "bias' was not discussed with the teachers. In each teaching situation, those teaching were encouraged to cover the content as thoroughly and as enthusiastically as possible.

Tests

Following instruction in the ASSURE Model , both groups were then posttested for recall of its content with objective tests drawn from the test bank prepared by Heinich, Molenda, and Russell (1993). These authors created the ASSURE Model, and the test banks were prepared to accompany their text, *Instructional Media* , which advocates the use of the ASSURE Model throughout. The validity and reliability of these tests have been established by these authors. Since simple recall was the variable being tested in this study,

only objective questions were selected for testing. Students were tested on their recall of the content of the ASSURE Model.   Each test contained eighteen items which comprised the content of the instruction .

All tests were given in the same location and during the same class periods as the initial instruction. In each testing situation, students were allowed as much time as needed to complete the test. In order to compare the recall of the groups over a period of time and compensate for the interaction of time of measurement and treatment effects, three tests were given: one immediately following instruction; the second two weeks later; and the third five weeks after the initial instruction. As Gay(1987) contends, it is a known threat to generalizing that posttesting may yield different results depending on when it is performed. A treatment effect based on an immediate posttest may not be found if the posttest is given some time later. While performing delayed posttests does not completely solve this problem, it does greatly minimize it .

Method of Data Analysis

The method of *Data Analysis* was to compare the posttest scores to determine the effectiveness of the treatment. The pretest was used to determine if the groups were essentially the same previous to the experiment. Posttest scores were then directly compared using a t-test.

The chapter following chronicles the results of this experiment designed to test the hypothesis that *college students who receive instruction in a storytelling fashion will not demonstrate greater recall of instructional content than students who receive the same instruction in a more traditional lecture method.*

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Chapter 4

Analysis of Results

This study was designed to determine what if any effect storytelling as a method of teaching has on retention of information. More specifically, this work was fashioned to determine if storytelling is more effective than a more traditional lecture method in positively influencing lesson recall.

An experiment was constructed to test the hypothesis that *college students who receive instruction in a storytelling fashion will not demonstrate greater recall of instructional content than students who receive the same instruction in a more traditional lecture method* . In the Spring Semester of 1994, 114 students were randomly selected from three undergraduate college courses in Instructional Media . The courses were held at the University of Tennesse Knoxville, Milligan College, and East Tennessee State University. After reading and signing letters of consent, students were randomly picked by drawing their names from a hat to participate in either a control or experimental group. Both groups were then given instruction in the same material presented in different fashions. The control group was instructed in the lecture method, while the experimental group was given the same content by means of a story-telling method.

The experimental design used to test the hypothesis was the *Pretest-Posttest Control Group Design,* which involved two groups formed by random assignment. Both groups were administered a pretest of the dependent variable (the content of the ASSURE Model). One group received then a treatment (teaching the ASSURE Model with a storytelling method), while the control group received the same teaching via the lecture method. Both groups were

then posttested on three different occasions.

A pretest was used to see if the groups were essentially the same with respect to the dependent variable (knowledge of the content of the ASSURE Model). Here, the control group (n=58) had a mean score of 2.78. The experimental group (n=56) had a mean score of 2.48 A t-test run on these scores showed a computed t-value of 0.376113. At Alpha=.05, this figure indicated the null hypothesis was not to be rejected, which meant that there was no significant difference in the groups on the dependent variable (Table 2). A frequency distribution and polygon of pretest scores are in Table 3 and Figure 1.

Three posttests were then given: one immediately following instruction; the second and third tests three and five weeks following. In the first posttest (given immediately following instruction), the control group (n=57) had a mean score of 12.8. The experimental group (n=56) had a mean of 15.3. The computed t statistic here at alpha=.05 was 2.645,indicating that there was a statistical significant difference between these scores at the .05 level of significance. The null hypothesis was therefore rejected (Table 4). A frequency distribution and polygon of Posttest #1 are presented in Table 5 and Figure 2.

Table 2. Analysis of Pretest Scores

Group	N	M	SD	Computed t. Value
Control	58	2.775	3.474	
Experimental	56	2.482	4.782	0.376113*

*At Alpha = .05, Do Not Reject H_0

Table 3. Frequency Distribution Based on Pretest Scores

Score	Frequency of Score Control Group	Frequency of Score Experimental Group
0	21	28
1	9	5
2	5	7
3	5	7
4	4	2
5	3	0
6	0	1
7	7	2
8	1	2
9	0	0
10	0	0
11	1	0
12	0	1
13	1	1
14	0	0
15	1	0
16	0	0
17	0	0
18	0	0
Total	**58**	**56**
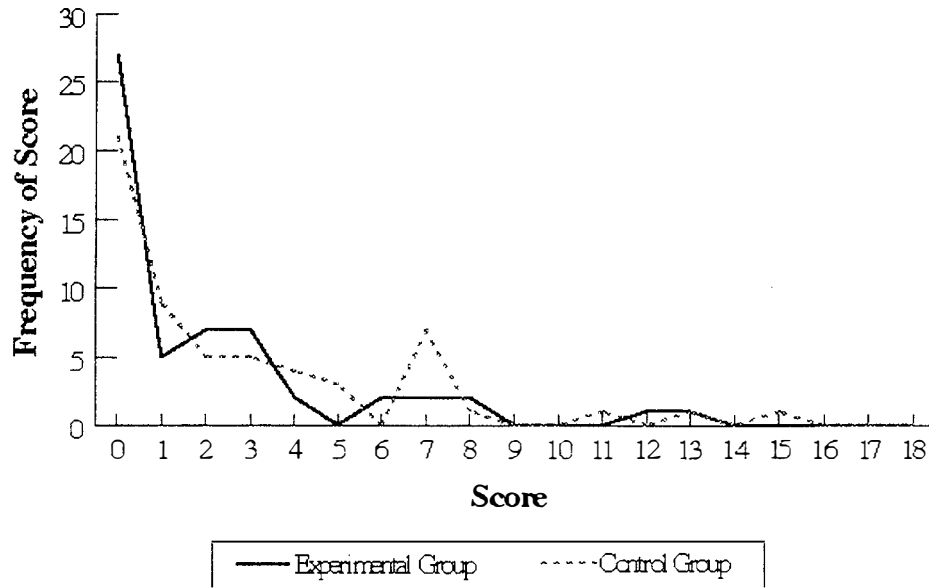
Figure 1. Frequency Polygon Based on Pretest Scores

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Table 4. Analysis of Posttest #1 Scores

Group	N	M	SD	Computed t. Value
Control	57	12.88	3.611	
Experimental	56	15.32	1.557	2.645*

*At Alpha = .05, Reject H_O

Table 5. Frequency Distribution Based on Posttest #1 Scores

	Frequency of Score	
Score	Control Group	Experimental Group
0	0	0
1	0	0
2	0	0
3	0	0
4	0	0
5	2	0
6	1	0
7	2	0
8	6	0
9	3	0
10	0	0
11	5	1
12	4	2
13	4	8
14	3	3
15	7	9
16	13	19
17	7	14
18	0	0
Total	**57**	**56**
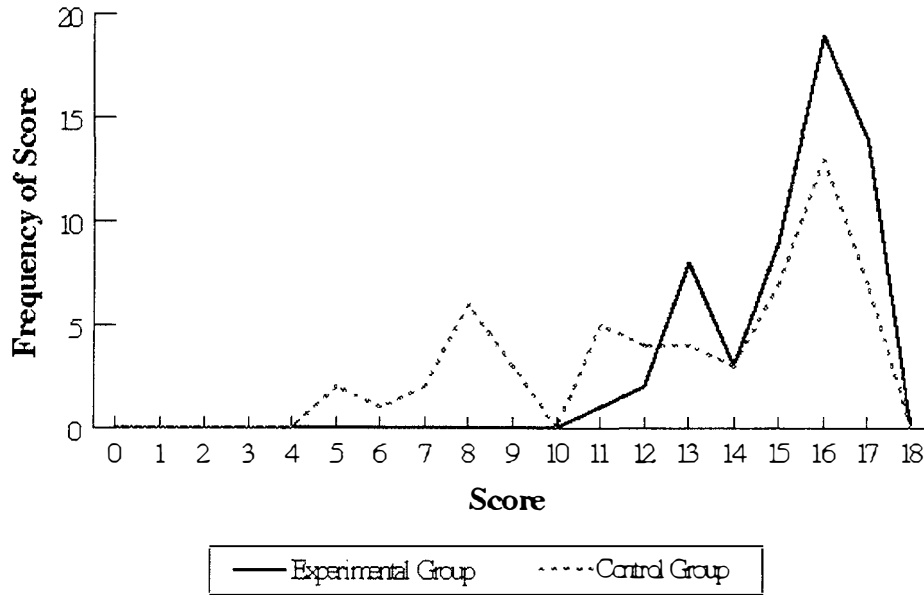
Figure 2. Frequency Polygon Based on Posttest #1 Scores

In the second posttest (given three weeks later), the control group (n=48)had a mean score of 8.7, while the experimental group (n=46) had a mean score of 11.8 The t-test here rendered a score of -2.98346 at the .05 level of significance. The null hypothesis here was therefore rejected (See Table 6 below). Table 7 and Figure 3 illustrate the frequency of scores on the second posttest.

The third posttest gave results similar to the second. Here, the control group (n=35) had a mean score of 9.2, while the experimental group (n=42) had a mean score of 13.3.   The t-test here at Alpha= .05 yielded a score of -4.24844, which indicated that the null hypothesis was to be rejected (Table 8). Table 9 and Figure 4 illustrate frequency of scores on Posttest #3.

Table 6. Analysis of Posttest #2 Scores

Group	N	M	SD	Computed t. Value
Control	48	8.708	5.500	
Experimental	46	11.804	4.485	-2.98346*

*At Alpha = .05, Reject H_O

Table 7. Frequency Distribution Based on Posttest #2 Scores

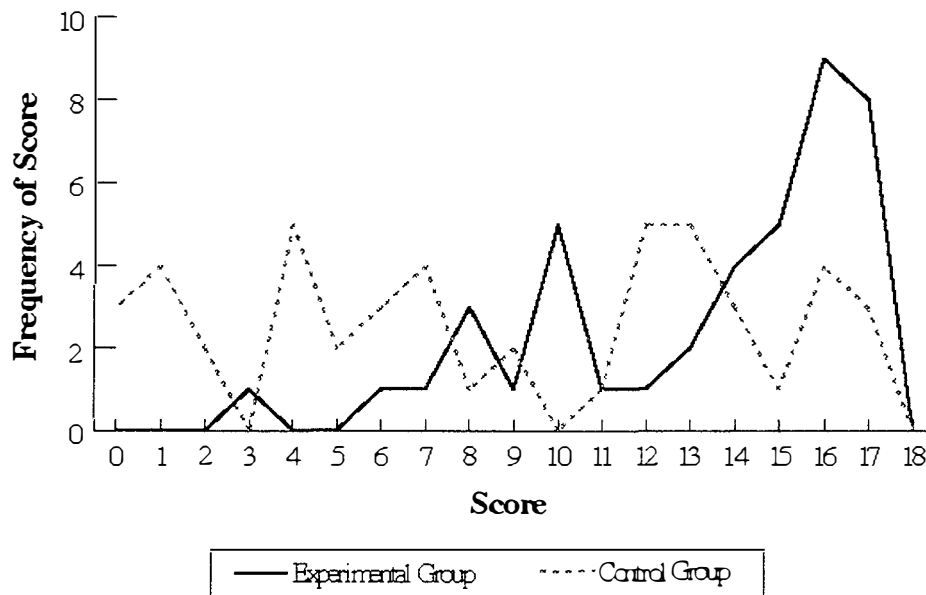|	Frequency of Score	
Score	Control Group	Experimental Group
0	3	0
1	4	0
2	2	0
3	0	1
4	5	0
5	2	0
6	3	1
7	4	1
8	1	3
9	2	1
10	0	5
11	1	1
12	5	1
13	5	2
14	3	4
15	1	5
16	14	9
17	3	8
18	0	0
Total	**48**	**42**

Figure 3. Frequency Polygon Based on Posttest #2 Scores

Table 8. **Analysis of Posttest #3 Scores**

Group	N	M	SD	Computed t. Value
Control	35	9.228	4.747	
Experimental	42	13.309	3.679	-4.24844*

*At Alpha = .05, Reject H_o

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Table 9. Frequency Distribution Based on Posttest #3 Scores

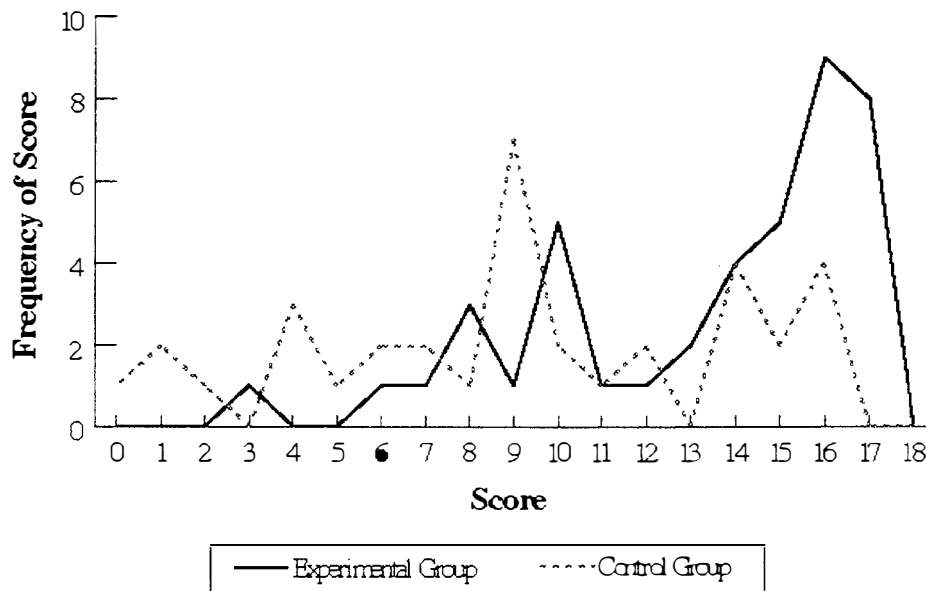| Score	Frequency of Score	
	Control Group	Experimental Group
0	1	0
1	2	0
2	1	0
3	0	1
4	3	0
5	1	0
6	2	1
7	2	1
8	1	3
9	7	1
10	2	5
11	1	1
12	2	1
13	0	2
14	4	4
15	2	5
16	4	9
17	0	8
18	0	0
Total	**35**	**42**

Figure 4.   Frequency Polygon Based on Posttest #3 Scores

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The differences in the number of participants in the posttests was due to students being absent on the days these tests were administered.

The acceptance of the null hypothesis for the pretest indicated no statistically significant difference in the scores of the two groups. This meant that the two groups were the same in respect to their knowledge of the dependent variable (knowledge of the content of the ASSURE Model) at the start of the experiment. The rejection of the null hypothesis for all of the posttests led to the conclusion that the groups were statistically significantly different from each other in relation to the hypothesis that *college students who receive instruction in a storytelling fashion will not demonstrate significantly greater recall of instructional content than students who receive the same instruction in a more traditional lecture method.* Rejection of this hypothesis obviously indicated that teaching in a storytelling fashion in this particular experiment significantly facilitated recall of the instructional material. In the following chapter, conclusions and implications of this finding are discussed.

Chapter 5

Conclusions, Implications of the Study

A commonly recognized problem is that students forget instruction. A valid concern of good teaching, then, is to develop methods that might positively affect student recall of instruction. This study was constructed to determine what if any effect storytelling as a method of teaching has on retention of information. More specifically, this work was designed to determine if storytelling is more effective than a traditional lecture method in affecting lesson recall.

In Chapter 2 of this study, a review of the literature concerning memory and/or recall revealed that one method of manipulating information for better memory is the *mnemonic*, a term designating a technique or system to aid the memory, usually by the use of some formula. Mnemonics actually arrange material based on the research-based principles known to positively affect recall. This chapter also reviewed literature advocating storytelling as an effective teaching strategy. Since many of the characteristics of mnemonics (such as aiding attention, creating meaning, association, and positive feeling tone) are found in storytelling, it was referred to as possessing the potential to be a "natural" mnemonic.

The third chapter recorded an experiment that was constructed to test the hypothesis that *college students who receive instruction in a storytelling fashion will not demonstrate greater recall of instructional content than students who receive the same instruction in a more traditional lecture method.* In the Spring

Semester of 1994, 114 students were randomly selected from three undergraduate college courses in Instructional Media . After reading and signing letters of consent, students were randomly picked to participate in either a control or experimental group. Both groups were then given instruction in the same material presented in different fashions. The control group was instructed in the lecture method, while the experimental group was given the same content by means of a storytelling method. Both groups were then posttested. Posttest scores were compared with a t-test to determine the effectiveness of the treatment.

Chapter 4 of this study contained the results of the experiment conducted to test the hypothesis. In each instance Postests showed that the students who received instruction by means of a storytelling method showed significant gains in recall over students who received the same instruction in the more traditional method. Because of t-test comparisons of scores, the null hypothesis was rejected.

Conclusion

Since the research hypothesis that *college students who receive instruction in a storytelling fashion will not demonstrate greater recall of instructional material than students who receive the same instruction in a more traditional fashion* was rejected, this investigation affirms that, at least for the population described in the experiment (college undergraduates enrolled in education courses), instruction in a storytelling fashion can make a difference in the recall of instructional material. Since storytelling innately shares qualities common to mnemonics, it may indeed be considered a "natural" mnemonic, and it therefore holds promise for use as a teaching strategy to positively influence recall. Although this observation is somewhat obvious, it has

implications in several areas of educational concerns. These implications are presented for three types of individuals: educational researchers, writers and producers of educational software and other curricular materials, and classroom teachers.

Implications

For educational researchers, this study helps document the value of storytelling, raising its value above the testimonial level now in existence. The books and articles named in this study reported many classroom successes as a consequence of either storytelling or adopting a storytelling method of instruction. It was noted however, that the weight of this literature is anecdotal and evangelistic in nature. Little of the available writing reflects work based in experiments. Consequently, this study reflected a desire to "open the door" to experimentally based studies of storytelling as a teaching method. Gruneberg and Morris (1992) note that the study of memory has been approached in several ways. One approach has been to identify key memory phenomena that illustrate how human memory operates. A second approach has attempted to explain memory phenomena within a framework or according to a model or theory. A third approach has attempted to improve a person's ability to perform memory tasks. A fourth, and less recognized approach has attempted to facilitate the performance of memory tasks, i.e., by producing transitory improvements in the individual's capacity to acquire, retain, and remember information or events. For a variety of reasons, research has focused almost exclusively on the first three approaches. And yet the primary goal in many applied (teaching) situations is memory facilitation. A storytelling method appears to hold promise for memory facilitation. A foremost implication of this

experiment is therefore that additional research into the dynamics of storytelling as a mnemonic teaching method needs to be conducted.

One obvious application of this study would be the replication of the same experiment, both with subjects similar to the ones mentioned here (college undergraduates), as well as with other age groups. This experiment was conducted with students in one discipline (education). Similar experiments involving students in other disciplines are called for. Currently, storytelling strategies are frequently reported with younger students. Further experiments may validate a wider use of stories and storytelling methods with a variety of disciplines and age groups.

Several questions relating to storytelling could be addressed in other studies, such as "Will students remember stories *embedded* within instruction as well as the instruction in which they are embedded ?"; or "Could students *create* their own stories and in turn increase their recall of instructional materials?" "Would student-generated stories result in greater recall than teacher-generated ones?"; "Are certain *types* of stories more memorable than others?" "What other *types of instruction* could be compared to a storytelling approach for influencing recall? " ; "Will a storytelling method prove as effective in influencing recall as other known mnemonic approaches?"

In his book, *Teaching as Storytelling (1986),* Egan developed a "story form model" for instruction, designed to be adapted to any subject matter. In this method, teachers are encouraged to think of and work with lessons as though they were "good stories to be told" rather than sets of objectives to be achieved. His story structure is to be used as a model for putting together course units having a theme, conflict, climax and resolution. Within this frame-work, relevant individual stories are to be inserted as deemed appropriate.

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Egan's approach is intriguing and appealing. One might suspect that his model of teaching would positively influence recall, but to date no one has attempted to experimentally test such suspicions.

Demonstrating a method of instruction to be effective has obvious applications to *witers and producers of curriculum materials* . If a storytelling method strengthens recall, materials using it will be helpful and welcomed. Within his storytelling approach to teaching, Egan (1986) advocated thinking of the curriculum as the "lore" of a complex tribe. The myths of the tribe encoded all that was most true and significant. Thinking of curriculum in this fashion would encourage teachers to focus on making instruction a coherent narrative of the most true and significant aspects of our world and experience. Such narratives could form the core of a "Great True Stories of the World" curriculum, designed to introduce children to the great stories by which we can make sense of our world and experience. This approach is similar to the practices of many "Whole Language" classrooms, where a story often forms the core of a multitude of related activities, or a "Great Books" or education-by-reading approach similar to the curriculum of St. John's University.

If storytelling methods are indeed effective in positively influencing student's recall, then it is advisable for *classroom teachers concerned with recall* to investigate and develop storytelling methods of instruction, and to use such methods repeatedly. Schank(1990) wrote, " A good teacher is not one that explains things correctly, but one who couches explanations in a memorable format." While a storytelling method is by no means the only way to instruct, it may be one of the more memorable, and when recall is a concern, it may be positively affected by a teacher with storytelling skills in his or her repertoire. In his postscript to Betty Rosen's book, *And None of it Was*

Nonsense, Harold Rosen said, "The impulse to story is present in every child; a storytelling culture in the classroom refines and enlarges upon that impulse." (1988) Gudmundsdottir (1991) called classrooms "places where stories are told." Textbooks tell stories and teachers bring stories to tell, stories about the subject matter they teach. Such stories "organize the curriculum" and are communicated in the classroom throughout the school year. Gudmindstottir investigated the teaching styles of two history teachers with reputations for their effective instruction, and asserted that the "secret" of their success was that they were "master story-makers and story-tellers." Jakob Amstutz, one-time philosophy professor at the University of Guelph, compared the use of stories to driving nails into a wall. These nails held up the weight of his classroom content:

> I tell a lot of stories. Stories are nails that I hammer into the wall. On those nails I can hang up the whole, usually abstract, conceptual stuff of a philosophy course. If there are no nails on the wall, all the stuff falls down and will be forgotten. But if there are stories, illustrations, and visualizations, they will not be forgotten; and contained in the stories there are the problems and concepts. Years later students will remember the stories, and because of the stories, still understand the concepts.

Barton (1986) advocated setting up the classroom as a "Village of Stories and Storymakers." He declared that stories can be "burrowed into, built into; they can provide the stimuli for talk, extended reading, and a host of interpretive activities." His books are replete with examples of what he calls "retelling" or going back into a story after it is told and exploring various "spin off" types of learning activities involving a variety of academic disciplines.

In a "Village of Stories" classroom, a teacher might adopt Egan's (1989)

"new" paradigm for the teacher--that of the storyteller in primitive tribes. As the storyteller told the children the myths of the tribe, the contemporary teacher is the "Teller of the Myths" ("Myth" here is understood as that which the tribes considered most true and significant). An important reason to consider any paradigm for teachers and curriculum is that our actual practices often reflect our paradigms. For example, the emergence of the computer has influenced the growth of the information-processing theories about how we receive and store information. Egan (1986) notes that one great technical innovation in this century was the assembly line. Instead of building, for example, an automobile in one place, bringing the components to it and having the same workers do all the different constructive jobs, the various bits and pieces of the car were gathered together at different places along the line to be slotted into place at the appropriate time. The workers each have specialized functions which they performed in the line. The initial design of the assembly line determined the details of the process. Similarly, the analogy of the assembly line provides one way to think about education. Thus Cubberly could write that schools were factories in which the raw products (children) could be shaped and fashioned into products to meet the various demands of life. Here the process of teaching and planning teaching could be represented in a model that is similar to the assembly line. We first describe our final product (or state our objectives), then we assemble the parts (or decide what materials and content we will need to achieve those objectives), then later on design some means of determining whether our product is satisfactory (testing or evaluation). Egan does not so much argue that such a model is *wrong.* He does, however question whether or not it is *adequate* to deal with human learning, which may occur in unpredictable and more complex fashions than products emerge from assembly

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lines.   Egan notes that storytelling is a way of establishing meaning, and it tends to be concerned largely with affective meaning. Much of education has tended to emphasize the cognitive at the expense of the affective, and he believes that planning and performing teaching as storytellers can help us achieve a better balance between the cognitive and affective domains.

Eggen and Kauchak (1988) acknowledged that no *single* approach to teaching is appropriate in all situations. Consequently, effective teaching requires *alternative* strategies to accomplish different goals. According to these two, the "best technique" is the one which is the most effective for reaching a particular goal in a given situation. Such actual selection and use of different procedures can occur only if the teacher possesses a *repertoire of techniques.* Fox (1993) suggests one way to view storytelling in the classroom is as a "power tool" among a whole cabinet of teaching tools; where each one is uniquely designed to help us achieve our goals and objectives.

It will prove important for such teachers to *regularly use* storytelling methods, simply because to do so aids the memory. Research has demonstrated that it is not merely enough to either *acknowledge* or *occasionally utilize* a particular strategy. The strategy, in order to be effective, must be *engaged repeatedly.*   Beaumont (1989) asserted that there are two elements in improving memory. The first involves *mastering the techniques* that enhance it. The second involves *practice and experience* in using these techniques to achieve maximum effectiveness.

Research has been conducted that concluded that even intensive-memory-improvement courses do not induce a permanent use of the mental manipulations taught,and consequently lack in lasting effectiveness in improving memory (Herrmann and Searleman,1990; Druckman and Swets,1988). The

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techniques learned in such courses must be *repeatedly utilized* to become effective.

Instructors may want to additionally teach their students the use of stories as mnemonic devices. Learning to couch information in a story form makes use of many of the known methods of manipulating information for memory. Students who have been taught to develop their own stories or use already existing stories as frames to hang information on may experience more effective recall. Through their experiments, psychologists have debunked the notion that memory is a skill in the sense that weightlifting is, that is, if one wants a good memory (or strong muscles), he simply practices memorizing (or lifting weights). Mere practice helps remembering only as long as one keeps on practicing, and it usually helps one remember only the material he is practicing, not other material (Norman, 1970).

It has been shown, however, that *practicing* proper methods of memorization is effective in the improvement of memorization itself. In 1927, Woodrow conducted experiments in which he found that a group of students who simply practiced memorizing lists for several hours did no better than a control group of students who did not practice. But a group of students who were instructed in proper *techniques* of memorizing did thirty six per cent better after the same amount of study (Norman, 1966). Cognitive psychologists hold the position that the use of mnemonic strategies can and does increase recall (Pressley and Levin, 1983). To adopt a mnemonic strategy can prove to be quite helpful to both teachers and students. Hunter (1964) pointed out that the mastery of some simple mnemonic system may lead some people to realize, for the first time, that they can control and modify their own mental activities. and this realization may encourage them to undertake "that self-critical

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experimentation with their own learning and remembering procedures which is such an important part of intellectual development. "

An old folk tale illustrates the power of story:

An old man and his son went for a walk one day.
"Son," he said to the boy, "shorten the road."
"I cannot shorten the road, father," he said, "unless I walk more quickly."
"You are not much good for anything, son," said the old man."We may as well go home."
They went home. On the morning of the following day they went out at about the same hour.
"Son," said the old man, "shorten the road."
"I cannot shorten the road," he said," unless I walk more quickly."
"You are not much good for anything, son," said the old man. "We might as well go home."
When they arrived at home, the son told to his mother the words his father said to him.
"Indeed, you are a son without sense!" said the mother. "When your father tells you to shorten the road tomorrow, begin a story, and I guarantee you that he will not bring you home."
On the morning of the following day they went out again.
"Son," said the old man,"shorten the road."
The son began a story, and they did not go back this time, but they continued to the end of the journey.

A storytelling approach will not take away the educational "journey." It can, however, "shorten the road," of teaching for recall.

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Appendices

Appendix A:
Informed Consent Letter

Dear Student,

I am conducting a study on the effect of storytelling on student recall of instruction. I have randomly selected students from your class for an experiment. During this experiment, one group will be taught with a storytelling method, and a second group will be taught the same subject matter in a fashion normally used in this class.

This letter is to ask your consent to be a part of the experiment. After the lesson there will be three tests for recall of the material presented. One test will immediately follow the lesson, and the second and third tests will be given later in the term.

Participation in this experiment will not harm you in any way, and it will not affect your grade in this course. Your participation is completely voluntary, and you may withdraw from it at any time without penalty. You may ask me any questions about the research by consulting me personally, or by calling me at 688-0708 (Knoxville) or 543-3465 (Elizabethton).

Cordially Yours,

Tommy Oaks

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Appendix B:

Pretest-Posttests

Note: The following objective test questions are taken from the test bank for the text, *Instructional Media* (Heinich, Molenda, and Russell, 1993). Posttests were designed to test simple recall of the particulars of the ASSURE Model. Previous to the tests, students were assured that their performance on the test would in no way affect their grade in the course, and they were encouraged (for the sake of an "honest" test) to avoid "guessing" when answering questions.

The tests were identical to each other, in that the same information was presented on the pretest and all posttests.

Scores were computed by giving one point for each correct answer. In questions requiring more than one item to be answered (questions 1 and 6), a point was given for each correct item. If a student answered all questions correctly, he or she would earn 18 points.

Pretest/Posttest

1. List and briefly describe the six steps in planning and delivering instruction that incorporates media.

2. An example of a general learner characteristic is:

    a. prerequisite skills

    b. attitudes about subject matter

    c. knowledge of the content

    d. age

3. What is the purpose of the ASSURE Model?

4. The basic steps in utilizing materials include:

    a. analyze audience, preview, present, evaluate

    b. state objectives, preview practice, prepare audience, present

    c. preview, practice, prepare environment, prepare audience, present

5. An example of a specific entry competency is:

    a. age of the learner

    b. intellectual aptitude

    c. prior knowledge of the subject

    d. cultural factors

6. Complete this procedural outline:

A_____

S_____

S_____

U_____

R_____

E_____

7. The purpose of stating objective includes all but one of the following. Which

is <u>not</u> a purpose?

a. to assist in selecting media

b. to help in designing evaluation

c. to deal with differences in motivation levels

d. to communicate with students

Sample Lecture Script for Teaching

The ASSURE Model

General Guidelines:

Before starting your instruction, please give your students the following information:

1. This instruction and testing will not affect your grade in this class.

2. Please try not to "guess" if you do not know an answer to a question. Since the test is to discover what you know or remember, if you do *not* know or remember, then *that is the correct answer*.

3. During the experiment, try to respond as much as possible as though this were a normal class. For example, if you normally take notes, please do so during the class.

Outline of the Content of the Instruction:

The ASSURE Model is a procedural guide for planning and conducting instruction that incorporates media. It is not a design for planning instruction per se, but specifically for planning instruction that incorporates media. It is designed to "Assure" the effective use of media in instruction.

The term ASSURE is an acrostic. Each letter stands for a step in the planning process. Here are the steps in outline form:

Analyze your learners: Look at

--General characteristics ("who" they are)

--Specific entry competencies ("where" they are in reference to the lesson

material)

State your objectives:

Objectives help you:

--Communicate what you need to get across

--Evaluate whether or not you get it across

--Select the media and material to help get it across

Select your media and methods:

Use what you have, or modify what you have, or make or buy your own.

Utilize your media and methods:

There is a five-step process here:

Preview--don't use what you have not seen

Practice--go over it yourself first

Prepare the environment--get the room, equipment ready

Prepare the students--get them ready to experience the media

Present the material

Require learner participation:

Have your students somehow "do" what it is you want them to do.

Evaluate:

Evaluate in two directions:

-the students, to see if they are "getting the point"

-yourself, your media and methods, to see if the process is "working."

(**Note:** Please review the test that will be given following your instruction. The

test contains 18 basic items, all taken from your presentation. Make sure that

you include these items in your lesson.)

Lecture Script:

(Note to the instructor: Do not feel that you need to slavishly follow this script. If you desire, you may consult the text *Instructional Media* by Heinich, Molenda and Russell for additional information about the ASSURE Model. Again, be sure to take a look at the test, so that you will not fail to mention the items that the students will be tested for recall on later.)

Up until now in this class, we have been looking at various types of instructional media. Today we want to learn about how to *plan* to effectively *use* instructional media.

There are many models "out there" designed to help plan instruction, but one model has been constructed which is intended to be used when you want to use media in teaching. Actually, this model was constructed to assure the effective use of media in teaching--and--since it is designed to assure effective use of media it is called (appropriately) the ASSURE Model.

The word ASSURE is an acrostic. Each letter stands for a word, and these words stand for the steps that, when put together, are designed to "assure" effective use of media in instruction. Let's look now at each letter and what it represents.

The first letter, "A", stand for "analyze. The first step in the ASSURE Model is to *analyze your learners.* It may not be necessary to analyze *every* psychological or educational trait of your students, but there are factors that help in making good media decisions. It stands to reason that the better you

know your students, the better you will be able to design instruction that will help them learn.

Two types of learner characteristics are considered in the ASSURE Model. They are: (1)General characteristics and (2)Specific entry competencies.

General characteristics of learners include broad areas such as their age, their grade level, cultural or socioeconomic statue. Note that these are not related to the *content* of the *lesson* , but rather to the *student.*

Specific entry competencies include:

--how much of the subject the student already knows;

-how many of the skills the student can already perform;

-whether the student has a positive or negative attitude toward the subject. Note that all of these matters are directly related to the *subject.*.

The first "S" stands for *State your objectives.* Having good objectives helps in several areas of concern. If you know what you want to do, you will be better able to choose what media will help you get it done. Clear objectives also help you evaluate. Since you know what you expect of your students, you also know whether or not they are reaching those expectations. Objectives also help you communicate well what you are trying to teach. Good objectives cover four areas, which are called the "A-B-C-D's" of objectives:

A: The audience. A well stated objective will name the audience for whom it is intended (Example: "...fourth grade students...").

B: Behavior: what the students will be able to do (Example.."will be able to recite the 23rd Psalm from memory...").

C: Conditions: under what circumstances the students will be expected to perform the behavior (Example: "...by writing it out on a sheet of paper...").

D:Degree: to what degree the new skill will be mastered (Example: "...without missing more than five words...").

The second "S" means to *Select your media and materials* Once you have analyzed your audience and stated your objectives, you have established the beginning and ending points of your instruction. The task is now to build a bridge between these two points. To accomplish this, you have three options. (1) You can select from material that is already available; (2) Modify existing material; or (3) design new material.

The "U" is next, and it stands for *Utilize the media and materials.* There are four steps here: (1) Preview the material; (2) Practice using it; (3) Prepare the environment and your people to experience the presentation; and (4) Present the material, using good showmanship.

The "R" stands for *Require learner participation.* The one condition that pertains to all objectives is the practice of the desired skill. So in some way you must plan a way for the learners to be engaged in activities that let them respond to the teaching.

`   The "E" stands for *Evaluate and revise.* After the instruction, you must evaluate the entire instructional process. You will ask yourself these three questions: (1) Did the learners meet the objectives? (2) Did the media assist in reaching the objectives? (3) Could all students use the material properly? If you cannot say "yes" to these questions, you will want to revise the plan for the next attempt at using media in your instruction.

Appendix D

Story Script for Teaching

The ASSURE Model

General Guidelines:

Before starting your instruction, please give your students the following information:

1. This instruction and testing will not affect your grade in this class.

2. Please try not to "guess" if you do not know an answer to a question. Since the test is to discover what you know or remember, if you do *not* know or remember, then *that is the correct answer.*

3. During the experiment, try to respond as much as possible as though this were a normal class. For example, if you normally take notes, please do so during the class.

Outline of the Content of the Instruction:

The ASSURE Model is a procedural guide for planning and conducting instruction that incorporates media. It is not a design for planning instruction per se, but specifically for planning instruction that incorporates media. It is designed to "Assure" the effective use of media in instruction.

The term ASSURE is an acrostic. Each letter stands for a step in the planning process. Here are the steps in outline form:

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         material)

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Objectives help you:

> --Communicate what you need to get across

> --Evaluate whether or not you get it across

> --Select the media and material to help get it across

Select your media and methods:

Use what you have, or modify what you have, or make or buy your own.

Utilize your media and methods:

There is a five-step process here:

> Preview--don't use what you have not seen

> Practice--go over it yourself first

> Prepare the environment--get the room, equipment ready

> Prepare the students--get them ready to experience the media

> Present the material

Require learner participation:

Have your students somehow "do" what it is you want them to do.

Evaluate:

Evaluate in two directions:

> -the students, to see if they are "getting the point"

> -yourself, your media and methods, to see if the process is "working."

(**Note:** Please review the test that will be given following your instruction. The test contains 18 basic items, all taken from your presentation. Make sure that you include these items in your lesson.)

Story Script

(Note to the instructor: Do not feel that you need to slavishly follow this script. If you desire, you may consult the text *Instructional Media* by Heinich, Molenda and Russell for additional information about the ASSURE Model. Again, be sure to take a look at the test, so that you will not fail to mention the items that the students will be tested for recall on later.)

You might not believe this could really happen, but I am here today to tell you that once upon a time I read something in a media text that actually worked in real life.

What I read was a description of a thing called the ASSURE Model, and here's how it helped me:

It all started with two big mistakes I made.

First, I let myself be persuaded to coach a little league basketball team called the PeeWees.

Second, I was not present when the coached picked their players. They cordially volunteered to pick my players for me. Guess who they picked?

I wound up with 10 boys who did not know a basketball from a lollipop. . .Well, actually they did know lollipops.

Among our players were the following personalities:

Reuben--our "Slider." He loved to run to the half-court line and go for distance with slides.

Michael was our "Twirler." Like a ballerina, he circled up and down the floor.

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Wayne had played PeeWee football, and he liked to tuck the basketball under his arm and run with it.

And Roy? We never called him "Roy." It was always "Roy, Roy, Roy." He was our tallest player, happy to be there, and his head was somewhere in the clouds. He only came down after the third mention of his name.

The lines on the floor meant nothing to our boys. Dribbling? They did not know that was what you did when you went somewhere with the ball. Defense? They preferred skipping along beside opponents to staying between them and the goal.

Practices were disastrous, and games were worse.

. . .Now, here's where the ASSURE Model comes in. About midway into our season, I was reading this media text, and I ran across the ASSURE Model. It was designed to help teachers plan everyday use of media in the classroom. Its title is a deliberate choice, for its purpose is to "assure" the effective use of media in instruction. As I read about how the ASSURE Model worked, I began to think that perhaps I could use it to teach basketball.

I had media--"stuff." I had a gym, basketballs, a bunch of folding chairs, boys with parents. . .and I wondered if maybe I could "assure" the effective use of it.

So I decided to try the model. Now the word ASSURE is an acronym-- each letter stands for a separate word, and each word describes a step in the model.

The "A" stands for *Analyze your students.* I sat down with my assistant coach and took a good look at the boys. Two categories the ASSURE Model calls you to examine are (1) general learner characteristics and (2) specific entry competencies.

General learner characteristics have to do with who the students are.

You look at such things as their age, socioeconomic status, and cultural factors.

Specific entry competencies have to do with your learner's relationship to the subject matter. You ask questions like, "What do they know about this?" and "What can they do right now?" Also, "What is their attitude toward the subject?"

As we analyzed the boys, we came up with a profile. Generally, we had white, middle class, first grade boys. Specifically, they had great attitudes, were eager, but knew nothing and could do about the same.

Reflecting on who the boys were definitely affected what we did in the second step. The letter "S" here stands for *State your objectives.* Your objectives are what you want your students to be able to do. Good objectives help you in three ways.. They help you communicate (you know what you want to teach); they help you evaluate (you know whether or not your students are "getting" what you want them to get); and they help you select the media and methods you might use to help them get where you want them to go. As we analyzed our boys, we decided that we had not formed any appropriate objectives.

Actually, we had pretty much been thinking only in terms of how to win a game. We realized that this aspiration was a bit lofty for us. So we came down out of our clouds and made a list of things we thought it would be nice for our boys to be able to do. Things like:

-Reuben should slide less

-Michael should learn to run as well as twirl

-Wayne should dribble when he runs with the ball

-everyone should pick up a few things, such as:

    -dribbling as a way to move the ball

    -shooting at the basket instead of throwing the basketball like a baseball

-Standing between one's opponent and the goal

-What the lines on the floor mean

Good objectives can be stated in "A-B-C-D" fashion.

A= The intended audience.

B= The behavior desired.

C= The conditions under which the behavior will be expected

D= the degree to which the behavior will be mastered.

We took these "A-B-C-D's" and made little objective statements for each of the boys. The statements read something like "(A) Wayne (B) will dribble the ball when he moves down the court (C) during practice and games (D) more times than he runs with the ball."

The second "S" stands for *Select your media and methods.* We went down to the gym and looked around. The ASSURE Model advises either using what you have, modifying what you have, or creating new materials. We decided to use what we had in as creative and helpful fashion as possible.

We decided we might be able to use folding chairs to make a maze for the players to dribble through. We took a few chairs and taped cardboard on them for the boys to practice shooting over. We devised a game where three players would try at all times to stay between three other players and the goal, and we decided to ask parents to come in and run these events.

We did not want to mess with the boy's sense of play. They had that down quite well. So we decided to take all of these activities and run practice like a carnival, with each station similar to a booth one would stop at.

The letter "U" stands for *Utilize your materials and media.* The ASSURE Model suggests you utilize material in a five step process (all beginning with the letter "P"). First, you preview. You don't want anyone to go through something

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that you are unfamiliar with. Then, you practice it. So the assistant coach and I went down to the gym, set up the maze, ran through it, shot over the cardboard, and played a little of the "between me and the goal " game. After you preview and practice, you prepare the place (we set up the gym), then prepare the students (we gave the players a little pre-practice pep talk before they participated in our "carnival") and finally, you present the material. Our practices constituted our presentations.

Next comes the letter "R" which stands for *Require learner performance.* Somewhere along the line, you always want your students to be able to "do" what you are teaching. Here we had a natural setting: each Saturday we had a game, and the game provided an ideal setting to practice the skills we were learning.

The final letter,"E" stands for *Evaluation.* The ASSURE Model suggests you evaluate (1) the students, to see if they are actually "getting" the instruction, and (2) your own teaching and media and methods to see if they are actually "working."

I enlisted the help of parents here. I gave each parent a little worksheet to fill out on their boy. For example, Reuben's parents charted the number of slides he performed. If he slid fewer times this game than the last, he was making progress. Similarly, if the boys were called less for walking, if they shot instead of threw the ball, if they stayed between their opponent and the ball, etc., we were able to chart progress or the lack of it. Following the games, my assistant and I would sit down, tally the sheets, and use them to help us supplement the following practices.

The end result? Well, we won one game that year--by forfeit. We did, however, show improvement in all areas. The boys did learn what the lines on

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the floor meant. The dribbled. They began to play defense. Reuben slid less. Michael almost entirely stopped his twirling--and they all kept their sense of play.

We played our best game of the season in the last game, too. Since we were the lowest ranked team, we played the highest ranked team for the first game. We led part of the time, and they only beat us 4 points. We all were quite happy, and we thanked the ASSURE Model for giving us direction.

Vita

Tommy Oaks was born in Elizabethton, Tennessee on March 14, 1947. He received a Bachelor of Arts Degree from Johnson Bible College, Knoxville, Tennessee with an emphasis in English Bible and Ministry in 1969. In 1979, He received a Master of Arts in Religion from Emmanuel School of Religion in Johnson City, Tennessee. He went on to receive a Master of Arts from East Tennessee State University in Language Arts with a major in Storytelling in 1989. He enrolled in the College of Education at the University of Tennessee in the Fall of 1990, and received the Doctor of Philosophy Degree in Education in the Fall of 1995.

Tommy is married (to Patricia Ann Combs Oaks), is the father of two sons (John Thomas and Jason), and the grandfather of Caleb Travis Oaks (son of Jason and Misty Oaks). He is a travelling storyteller/speaker, and an educator. Much of his speaking is with church groups. He teaches in the Storytelling Department of East Tennessee State University, and has taught classes at Milligan College in the Education Department. He has additionally taught storytelling workshops in a variety of settings, including within the College of Education at the University of Tennessee. He has had articles published in various religious publications, and has had articles relating to storytelling published in the *National Storytelling Journal* .