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Cognitive Function and the Administration of a Writing Strategy Compendium Incorporating Autobiographical Recall and Art

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The University of Southern Mississippi

COGNITIVE FUNCTION AND THE ADMINISTRATION OF A
WRITING STRATEGY COMPENDIUM INCORPORATING
AUTOBIOGRAPHICAL RECALL AND ART

by

Jonnie Sue Cleveland

Abstract of a Dissertation
Submitted to the Graduate School
of The University of Southern Mississippi
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy

May 2015

ABSTRACT

COGNITIVE FUNCTION AND THE ADMINISTRATION OF A WRITING STRATEGY COMPENDIUM INCORPORATING AUTOBIOGRAPHICAL RECALL AND ART

by Jonnie Sue Cleveland

May 2015

The ability to write is vital in many academic areas (U.S. Department of Education, 2011). Roughly 70% of U. S. students in a representative sampling during 2010 (grades 8 and 12) scored only at the *Basic* (fractional grasp of prerequisite information and abilities) level and below (U.S. Department of Education, 2011). Fifty-four percent of students in the eighth grade and 52% of students in the twelfth grade in the United States scored at the *Basic* level. Another 20% of students in the eighth grade and 21% of students in the twelfth grade scored *below* the *Basic* level. According to the U.S. Department of Education in 2011, the need for effective writing teaching and evaluation was more germane than ever.

Due to low performance on previous assessments in 1998, numerous states and school districts developed strategies to advance the worth of writing that would be reactive to individual student needs (Graham, Harris, Fink-Chorzemper, & MacArthur, 2003). Wade (2005) concluded that interventions are needed to assist students in gaining a broader grasp of creating increasingly complex text to meet the growing challenges and requirements of rigorous curricula. Studies conducted by Davis (2003) revealed that autobiographical recall was shown to be an effective strategy in drawing out students' emotions and interests. Fartoukh, Chanquoy, and Piolat (2012) analyzed the way emotion

affected complex cognitive processes by using short-term autobiographical narrative writing. An analysis of variance revealed that students' work contained a significantly greater number of text words when a vocabulary of positive and negative emotions was utilized by teachers in short-term writing strategies than when a neutral condition was employed (Fartoukh et al., 2012).

Teachers struggle with innovative and creative ways to increase communication and cognitive function for all students, including students who are exceptional and twice exceptional (Besnoy, 2009). Two fast growing areas of exceptionality in the United States are Attention Deficit Hyperactive Disorder (Schwartz & Cohen, 2013) and Autism Spectrum Disorder (Sansoti, 2010). All twice-exceptional students possess strong intellectual and abstract thinking skills that can be developed by strategies that emphasize meta-cognitive control. Emergent approaches suggested that cognitive development occurs when students interact with the environment (Hillocks, 1987).

The purpose of this study was to conduct research using a writing strategy compendium intervention designed to increase cognitive ability for the participants. The scripted writing lessons included brainstorming, autobiographical recall, illustrative art, graphic organizers, peer and teacher feedback, and self-assessment. The compendium can serve as a tool for teachers to increase cognitive function during language arts venues and extend to all other subject areas. The results of the study will help educators understand the necessity for alternative measures of cognitive development for both exceptional and non-exceptional students, as well as all students who may require remediation.

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CHAPTER I

INTRODUCTION

Outcomes of the most recent National Assessment of Educational Progress (NAEP) assessment in writing showed that roughly 70% of the representative sampling of students in grades 8 and 12 scored only at the *Basic* (fractional grasp of prerequisite information and abilities) level and below (National Center for Education Statistics, 2012). Fifty-four% of students in the eighth grade and fifty-two% of students in the twelfth grade in the United States scored at the *Basic* level. Another 20% of students in the eighth grade and 21% of students in the twelfth scored *below* the *Basic* level. The two remaining levels in the assessment were *Proficient* (competency, subject-matter knowledge, application, and analytic skills) and *Advanced* (superior performance) (U. S. Department of Education, 2011). Only one quarter of students in the eighth grade and students in the twelfth grade achieved at the *Proficient* level in writing. The highest possible score of the writing assessment, *Advanced* (superior performance) was achieved by only 3% of both eighth and twelfth graders (Kuczynski-Brown, 2012).

According to the U.S. Department of Education in 2011, writing in the 21st century is described by its frequency and its effectiveness. The ability to write is vital in many academic areas. Writing is crucial for a dynamic and engaged citizenry (U.S. Department of Education, 2011). Clearly there is room in the writing curriculum of public and private schools for innovative, engaging writing strategies that would improve the content and thought processes behind the writing.

Background

Since being authorized in 1969 by Congress, the NAEP has endeavored to collect and analyze information about the knowledge and education of American students. Students in public and private schools in the grades of 4, 8, and 12 were sampled, assessed, and evaluated regularly in areas that represent basic academic subjects (U. S. Department of Education, 2011). The NAEP measured writing abilities using representative samples of students in grades 8 and 12. Scores were reported as average scale scores and as percentages of students performing at three achievement levels: *Basic*, *Proficient*, and *Advanced*. The assessment tasks reflected writing situations shared by both academic and vocational settings and asked students to write for several purposes and communicate to different audiences. Drawing from a sample of 24,100 eighth graders and 28,100 12th graders representing both public and private schools, the 2011 writing assessment asked students to complete two 30-minute tasks, each of which was intended to measure one of three communicative determinations: to persuade, explain, or convey experience. The prompts were accessible to students in a variety of formats, including articles from newspapers, current events, and videotapes in order to stimulate a detailed writing response. Results showed that 24% of students at both grade levels scored at the *Proficient* level, while 54% of eighth graders and 52% of 12th graders met the standard for "basic." Around 20% of both grades performed below the basic measurement, while only 3% scored at the advanced level (U. S. Department of Education, 2011).

Dr. Jack Buckley, commissioner of the National Center for Education Statistics asserted there has been little difference in stages of proficiency since 2007, when the Most recent writing assessment was conducted (U. S. Department of Education, 2011).

Students in both public and private school in grades 4, 8, and 11 were regularly sampled and assessed on writing and other subjects, but the 4th grade was not assessed in the most recent nation-wide evaluation in 2011. NAEP writing assessment results were connected to the 2011 results. In 2011, Dr. Buckley said in a press call that students' writing would be appraised holistically -- taking into account the student progression of thought patterns, organization, expansion of ideas, organization, vocabulary comprehension, grammar, and editing skills (U.S. Department of Education, 2011).

When the *National Assessment of Educational Progress (NAEP)* was administered during 1998, more than 60% of fourth-grade students were assessed in the “basic” in the writing category, meaning partial grasp of the abilities and acquired knowledge needed on the particular grade level. Another 16% of fourth-grade students scored below this basic achievement level (Graham et al., 2003; U.S. Department of Education, 1999). Due to low performance on the assessments in 1998, many states and school districts developed strategies to advance the quality of writing that would be reactive to individual student needs. Developing abilities to write lucidly and effectually was especially valued in an era that necessitates increasing requirements of expert knowledge. When students wrote in non-fiction areas such as science and history, intensive knowledge of required subjects and effective communication were paramount (Graham et al., 2003). The U. S. Department of Education (1999) determined that writing itself was an action of discovery.

Fuchs and Fuchs (2007) conceded that advanced educational outcomes in writing and many other subjects depended on adapting instruction to individual differences among students. The growing academic multiplicity in schools in the United States has

made individualized instruction particularly important (Fuchs & Fuchs, 2007). According to Wade (2005), teachers' writing standards in 1998 mostly related to corrective revision, grammar, and editing. Wade concluded that interventions were needed to assist students in gaining a broader grasp of creating increasingly complex text in order to meet the growing challenges and demands of rigorous curricula. Eckhoff and Urbach (2008) asserted that in order to create a coherent narrative or non-fiction piece of writing, a student required a number of thinking skills to be able to function at a deep level of thought processes.

Theoretical Framework

Development of cognitive, or reasoning, skills comprises inductive reasoning rather than deductive reasoning. Cognition is the activity involved in understanding, or the act of perception, which in its entirety comprises aptitudes, acuity, and judgment (Young, 2011). Cognition includes all progressions of consciousness by which knowledge is gathered, including as perception, recognition, comprehension, and reasoning. Cognition is an understanding different than the experience of pure emotion. The word "cognition" refers to physical brain function as well as to the intellect (Young, 2011).

Young (2011) concluded that philosophers throughout history have considered the character of cognition and the relationship between the experiences of a human and external actuality. Hayward, Das, and Janzen (2007) concluded that the essence of cognition is the process of decision; one entity is distinguished from other entities and is typified by some concept or concepts. Hayward et al. (2007) concluded that, during the process of the development of cognitive functions, principles are internalized and indirectly accessed through processes of memory, interpretation, and creative use of

information.

Eckhoff and Urbach (2008) wrote about cognition and the relation to creativity and imagination. Cognition is enhanced by teacher practices of assimilating student constructs of imagination into current understanding of child development and cognition. Original and creative thoughts are necessary for innovation and invention (Eckhoff & Urbach, 2008). Chapman, Hobbel, and Alvarado (2011) discovered that students' growth as writers is aided by student control over writing productions and allowing students to draw from personal experience. In order to be an effective instructor, a writing teacher needs to engage and draw out students' mental skills, using several levels of activity at once.

A program adopted by the city of New York and overseen by the Teachers' College and Writing Project involved use of a scripted curriculum that allowed teachers and students to investigate diverse writing forms and goals (Marteski, 1998). Marteski determined that the development of reflective practices including organization, revision, and structure help students improve cognitive thought processes. The processes that connect learning from past experiences to present writing assignments benefit writing abilities in language arts and other academic subjects. Boldt, Gilman, Kang, Olan, & Olcese (2011) resolved that students should be given opportunities to build upon a multiplicity of linguistic experiences and interests. When teachers paired with students to negotiate projects that related to specifics of participants' lives and the outside world, students developed new ways of using language.

Boldt, Gilman, Kang, Olan, and Olcese (2011) conducted research that focused on using the real events of students' lives as points of departure for writing; students

incorporated narratives within the writing. Genres investigated were narrative accounts, poetry, and exposition involving social issues of importance to students. Students were encouraged to brainstorm about immediate surroundings and to connect thoughts to the outside world. After the first draft was produced, the students worked in small groups and used critical thinking to expand ideas. Boldt et al. (2011) concluded that the approach built collaborative thinking, creativity, and academic skills.

Boals (2012) theorized that the creation of stories used in narratives brings structural meaning to writing. Meaning making involves seeing the events of life in a different way and attempting to make sense of events that appeared to be random at best. The making of meaning is the important common denominator of stress reduction in students who engage in creating narratives of life experience. The process of writing an autobiographical narrative that includes the introduction of innovative cognitive words to writing strategies benefits students' expressive writing and reveals meaning about important life events. Boals determined that the reason some students benefit from the narrative autobiographical process while others benefit less is the varied processing of events by students.

Davis (2003) developed a writing plan for producing an autobiographical essay. Suggestions to students were to daydream and brainstorm in order to recover memories. The development of sensory and descriptive details was the next step. Students were told to make notes without being concerned with the sequential order. The "movie" was then placed in order, developed and the conclusion was presented with imagination and insight.

Read (2010) was concerned about teachers' practices of giving students a topic and expecting production of a piece of writing without proper background. Read developed a method of scaffolding to aid students in recall of past events. Local history was included in the method of teaching writing; students were told about historical events as home cities were toured. A writing portfolio was produced that included drawings and photos to help students bring memories to consciousness for later writing. The researcher's theory included having the teacher provide and model examples, and students were able to write independently in a variety of genres (Read, 2010).

In Davis' study during 2003, students conducted interviews in order to engage in thinking about an autobiography. Students brainstormed about methods of interviewing that might be conducted. Meaningful results occurred; social and cultural issues were closely examined. Students constructed writing based on meaning and significance in the lives of families and other students. Groups collaborated to share experiences in art, poetry, and narrative. During the conduction of research involving multiple sources of data, strong evidence was revealed that students' multiple intelligences were stimulated and focused on creative and expository writing, cognitive thought was stimulated, and writing abilities were greatly enhanced (Davis, 2003).

Studies conducted by Davis (2003) revealed that autobiographical recall was shown to be an effective strategy in drawing out students' emotions and interests, often resulting in an increased use of sensual and descriptive detail. Cognitive thought processes were enhanced and further developed during the processes.

Relationships between students were deepened and enriched. Individual making of meaning in students' lives was often the result of the development of writing strategies involving autobiographical recall (Davis, 2003).

Fartoukh et al. (2012) conducted research to analyze the effects of emotion on complex cognitive processes by using short-term autobiographical narrative writing. Participants were 25 fourth and fifth grade students. Three autobiographical texts were produced, one each week, with a maximum time length for writing of 45 minutes. Texts were based on positive, negative, and neutral emotional experiences of students. Cognitive progress was measured after each writing session. Fartoukh et al. (2012) theorized that writing about an autobiographical event with emotional content would be more convincing and subjective than writing on topics of neutral interest to participants. An analysis of variance showed a significantly greater number of text words when an emotional vocabulary of positive and negative was utilized than in the neutral condition. The interface between emotional education and an emotional vocabulary noteworthy in the number of words produced ($p < .000$). Fartoukh et al. (2012) concluded that there may be precise connections between emotion and certain properties of writing and that autobiographical recall is a good method to induce emotional involvement. Further investigation into effects of emotion in the study of writing might increase students' cognitive writing development.

Statement of the Problem

Exhaustive research was conducted by the researcher regarding the production of interventions to enhance cognitive function by stimulating multiple intelligences of students to focus on creative and expository writing. Research uncovered numerous

studies involving strategies of autobiographical investigation in order to stimulate thought and creativity (Boals, 2012; Davis, 2003; Read, 2010). There were no studies that conducted intensive investigation into a specific and important incident in a student's life. Furthermore revealed in research were language arts interventions combining storybook illustrations and the viewing of fine art in galleries (Eckhoff & Urbach, 2008; O'Donnell, 2002). In addition, there were no studies revealed that used students' own art works to deepen and intensify cognitive function toward the production of narrative and expository literature.

While meaningful research has been conducted in the area of enhancement of cognitive (reasoning) functions through writing strategies, little information was found by the researcher about the development of cognitive function through writing interventions among those students who are exceptional, though the two fastest growing identified populations of disabilities are Autism Spectrum Disorder (ASD) and Attention Deficit Disorder (ADD) (Crisman, 2008; Koerth-Baker, 2013). Crisman (2008) discovered that during 1990, only 4.8% of students diagnosed with ASD were included in the general education classroom. By 2004, the percentage of ASD students who spent more than 80% of the school day in an inclusion environment increased to 29.1%. The percentage increased to almost 40% by 2006, according to the U. S. Department of Education (2011), National Center for Educational Statistics (2004). Attention Deficit Disorder, with and without the hyperactivity component, was thought in early 1990's to be 5% of the student population from kindergarten through twelfth grade. Data from the Centers for Disease Control and Prevention in 2013 showed that 11% of children ages 4 to 17 received a diagnosis (Koerth-Baker, 2013). Schwartz and Cohen in 2013 claimed that an

estimated 6.4 million children between 4 and 7 had been diagnosed with A.D.H.D at some point in life. The statistic represented a 16% increase since 2007 and a 41% increase during the last decade (Schwartz & Cohen, 2013).

Colangelo, Kelly, and Schrepfer (1987) conducted research about the importance of developing cognition among all students, including students who have disabilities. If the education of exceptional individuals is neglected in areas of cognitive and writing development, a valuable opportunity develop the educational prospects of all exceptional students will be lost. Exceptional students are a valuable resource. Leadership, creativity, discoveries, and the general elevation of the joy of learning are factors that exceptional students bring to all domains of education. Exceptional students represent a challenge to educators (Colangelo et al., 1987).

Purpose of the Study

The researcher examined whether the administration of a scripted three-lesson writing intervention compendium can make a significant difference in the learned cognitive function of exceptional and non-exceptional students. The area measured was the learned cognitive function of students.

Research Questions

Two hypotheses and two research questions explored the efficacy of a writing strategy compendium in improving verbal, non-verbal, and quantitative cognitive, or reasoning, function in exceptional and non-exceptional students.

Hypotheses

H₁: This study seeks to determine if there is a significant difference between the learned cognitive function of exceptional/twice-exceptional and non-exceptional students

pre-assessment, post assessment, and delayed assessment by *Cognitive functions Test TM (CogAT®) Form 7* assessment of cognitive functions.

H₂: This study seeks to determine if there is a significant difference between the learned cognitive function of students of exceptional/twice exceptional and non-exceptional abilities and varying ages after the administration of a writing strategy compendium.

Research Questions

This researcher seeks to determine if a writing strategy compendium can improve learned cognitive function of students identified as exceptional and non-exceptional.

This researcher seeks to determine if the administration of a writing strategy compendium can significantly increase the learned cognitive function of students among the following variables:

- a. Age
- b. Exceptionality/twice exceptionality
- c. Non-exceptionality

Limitations, Delimitations, and Assumptions

The limitations of the study were the following:

1. An instrumental effect due to possible inconsistency in the delivery of the language arts intervention because three different teachers implemented the intervention.
2. An instrumental effect due to the possible inconsistency in the delivery of the cognitive assessment instrument because assessments were given to separate participants and in separate locations by three to five teachers.

3. An experimental effect due to the identification process of gifted students in the State of Mississippi. Mississippi standards for identifying Gifted and talented students include either a group intelligence measure, a test of cognitive abilities with a minimum score at the 90th percentile, or a district-developed matrix approved by the Mississippi Department of Education (Spears, 2014). It is possible that a participant may have been identified as gifted by any one of the three measures and skewed the results of the post and delayed post assessments. The researcher was unable to ascertain the specific process of identification used to determine the participant's giftedness. According to the Mississippi Department of Education Gifted Regulations, identification information is kept in locked cabinets in administrative offices and is available only to persons directly involved in the identification process, directly involved in the gifted education program, or with a documented need to know. Parents of the participants may request and be granted access to the files (Spears, 2014).
4. Experimental mortality of differential loss of subjects – consequence caused by subjects dropping out of the study on a non-random basis.

The delimitations of this study were the following:

1. Student participants were limited to grades 2-6. Intelligence quotients of participants ranged from normal to exceptional. Disabilities of twice-exceptional students were limited to Attention Deficit Hyperactive Disorder, Attention Deficit Disorder, and Autism Spectrum Disorder.

2. Subjects in this study were of non-exceptional intelligence, exceptional with intelligence quotient (IQ) of 120 or more, or twice exceptional with IQ of 120 or more and a disability.
3. Data collected pertained to learned cognitive function only.
4. Reactive effects of experimental arrangements – an effect that is due to the fact that subjects realize they are participating in a study and thus reacting mainly to the uniqueness of the experience rather than to the treatment.

The assumptions of the study were: It was assumed that individual teachers administering the intervention and assessments followed directions correctly and objectively. It was assumed that the students follow the directions of the intervention and the assessments and will complete both with attention and focus.

Definition of Terms

During the course of research, several terms were found that were instrumental to the understanding of the participants and language arts interventions in this study. For the purposes of this study, the following definitions will be utilized.

1. *Attention Deficit Disorder (ADD)* -- a learning disorder that includes the subtypes (a) chiefly inattentive, (b) chiefly hyperactive/impulsive, and (c) combined type (American Psychological Association, 2013). Children with ADHD/ADD who necessitate special assistance must now be admitted to special education and/or related services according to federal law. Children identified with ADHD/ADD may qualify for special services under Part B of the Individual with Disabilities Education Act (IDEA), applicable when a child's ADHD/ADD is verified by a licensed health professional as a chronic or acute health problem that negatively affects the child's educational

performance. The child may be classified as Other Health Impaired (OHI), and the school is required to develop an Individual Education Plan (IEP) that is designed to meet the child's needs for education (Rabner, 2006). Three of the student participants in the study were diagnosed as ADHD/ADD. Results of the study were examined to compare assessment outcomes of the exceptional students with ADHD/ADD and the outcomes of non-exceptional students with ADHD/ADD. The anticipated outcome of the study was to improve the cognitive function of exceptional and non-exceptional students. Results may have shown hidden talents or an accelerated increase of cognitive function and add meaningfully to the research about ADD/ADHD students.

2. *Autism* -- a development disability characterized by withdrawal and defects of cognition that affect the use of language, verbal communication, and social interaction, and may adversely affect a child's educational performance (Iovannone, Dunlap, Huber, & Kincaid, 2003). Autism spectrum disorders (ASDs) epitomize a comprehensive group of developmental categorized by impaired social interactions, problems with verbal and nonverbal communication, and repetitive behaviors, or severely limited activities and interests. In 2011, according to Individuals Education Act administrative counts, an identification of Specific Learning Disability was the most frequent education classification, followed by Speech and Language Impairment" (U.S. Department of Health & Human Services, 2011). A child with a disability means a child evaluated in accordance with IDEA 2004, Sec. 300.304 through 300.311, and includes children with Autism spectrum Disorder, and who for the reasons described, need special education and related services (U. S. Department of Education, 2002). The Mississippi Autism Collaboration Coalition promotes early identification for young children with Autism

Spectrum Disorder and was created in 2010. In 2013, the State of Mississippi established the Mississippi Advisory Committee (MS Code § 37-169-1 (2013) in order to develop a strategic plan for the education and vocation of students with autism. The cognitive assessments of the two participants with autism in the study that used a writing strategy compendium as an intervention were compared to the assessments of both exceptional and non-exceptional students. The desired outcome of the study was to positively affect the cognition of the exceptional and non-exceptional students with autism and raise awareness of the latent talents possessed by children with autism, especially in Mississippi, where few resources for autism studies are available.

3. *Autobiographical recall* -- recollections of explicit and personal events. The emotional substance of an experience can affect how a particular incident is remembered. Feelings experienced during the recovery of autobiographical materials can influence the information remembered (Holland & Kensinger, 2010; Marteski 1998).

Autobiographical recall was utilized in the study as one of the elements in the writing strategy compendium that helped students develop meaning and an increase in cognitive process measures (Davis, 2003). Previous studies revealed that autobiographical recall was shown to be an effective strategy in drawing out students' emotions and interests, often resulting in increased use of sensual and descriptive detail in writing. Cognitive thought processes were enhanced and further developed during the processes (Davis, 2003).

4. *Brainstorming* -- a way to gather ideas by jotting down anything that comes to mind and used to create a starting point for the composition of a narrative (Johnstone, 2001). Brainstorming is an informal process useful to writing students because original

themes are generated. It was essential for the teacher to accept any brainstorming attempts with an open mind and without judgment in order to encourage students and not to dampen creativity at the early stages of the writing process. Common types of brainstorming are clustering, concept web mapping, and short timed free-writing (Deuja, Kohn, Paulus, & Korde, 2014; Writing Center, 2012; Zhenhui, 2007). Deuja et al. (2014) discovered that clustering of ideas can be effective within specific categories during the search of different domains of memory or semantic categories related to memories. A facilitator can enhance, manipulate, and encourage students to produce meaningful idea clustering. The smaller the number of categories presented to students, the more depth is created and possibly originality. The idea flow may be optimized if one category at a time is considered (Deuja et al., 2014). Brovero (2004) discovered that a story map could be appropriate for initial brainstorming. A page of plain white paper can be divided into three parts to create a story map boxes that represent a beginning, middle, and an end. The student can quickly jot down ideas and insert them into the appropriate boxes (Brovero, 2004). A third technique that may be used for brainstorming is free-writing. Students are requested to open minds to all thoughts and allow ideas to flow as an organic, free-association process, and quickly write everything that comes to mind. Students write without stopping about a specific memory for a timed period, such as 3 to 10 minutes; students are directed not to be concerned with neatness or grammar, but to simply get their ideas down on paper (Texas State Library and Archives, 2007). Specific ideas are selected later in the writing process (Writing Center at Elon University, 2014). The technique that was used in the study was free writing.

5. *Cognition* -- an innate ability to resolve problems by using varied strategies and approaches (Hallahan, Kauffman, & Pullen, 1997). Cognitive learning theory can be described as the integration of new knowledge into an existing knowledge bank maintained and kept as memory in monitored by the learner. Memory is methodical and dynamic rather than reflexive; mechanisms of memory are attentiveness, encrypting and recovery. Piaget concluded that schema could be described as the existing structure of the brain, an entity that frequently changes and progresses as individuals experience new exchanges of learning (Huitt & Hummel, 2003). Stagey and Ross (1975) developed studies about student drawing that involved Piaget's theories about the development of schemata. Stagey and Ross concluded that there were three essential processes composing the development of schemata required accretion, fine-tuning, and reconstruction. Accretion allows firsthand information to be recalled based on prior knowledge without any changes taking place. Tuning has an impact more directly on recollection as data causes an alteration. Reconstruction happens when new material cannot be incorporated into current memory in any other way (Stagey & Ross, 1975). Richardson (1985) concluded that Vygotsky's theory of cognitive learning centers on teaching that provides scaffolding, a supportive process that happens when a teacher becomes more of a facilitator by incremental stages and control of learning is handed over to the student. Jackson and Moyle concluded that results of scaffolding include increases in task proficiency, content that is as accurate as possible, and students' involvement in the learning process will be on varied levels to provide further support one another (Jackson, & Moyle, 2009). Sensory channels connect the new information to a database of prior knowledge and into short-term memory. Significant information is

kept in long-term memory and is able to be remembered later. In order to be efficacious, the teacher must take the focus off the context of the material and direct the emphasis to the context and proficiencies of the student. Students who have the ability to connect previous material to newly acquired concepts are more likely to recollect prior knowledge. (Yilmaz, 2011). The present study determined the learning ability, or reasoning process measurement, of participants pre-intervention, post intervention, and delayed post intervention using the *CogAT® Form 7 assessment*.

6. *Exceptional* -- students frequently identified as gifted students with a score at the 95th percentile or higher on one or more assessments such as cognitive ability tests such as Cognitive Abilities (CogAT) and Naglieri Nonverbal Abilities (NNAT), or an Intelligence Scale test such as Weschler Intelligence Scale for Children (WISC) (Neu, 2003). The Mississippi standards for identifying Gifted and talented students include a group intelligence measure or a test of cognitive abilities with a minimum score at the 90th percentile or a district-developed matrix approved by the Mississippi Department of Education (Spears, 2014). All students identified as gifted during the study were assessed in the public school systems of Mississippi (Cramond, 2004). States vary in their definition of giftedness; even individual districts vary. It is the right of states to make educational decisions about definitions of giftedness and the ways that educational funding will be used for the education of the gifted. Even in states that agree upon a theoretical definition, operational benefits may vary (Cramond, 2004). Cramond argued that giftedness might need to be defined in varied ways for different cultures nationally and worldwide. Nationally, Asians and Caucasians have been in gifted education since 1978, while minorities have been underrepresented with steady increases in

underrepresentation since 1994 (So Yoon & Gentry, 2009). Persson (2012) pointed out in a critique of cultural variation on ascendancy in a globalized knowledge/economy that gifted research and values of culture are incorporated within an international view that is severely weighed with Western views and considerations of giftedness are pushed aside. Essential to creating the most effective paradigm is the integration of all parts into the process of defining what constitutes giftedness in students; the dynamic needs intrinsic malleability receptive to refinement and cultural sensitivity. According to Jackson and Moyle (2009), Dabrowski concluded that gifted children have innate abilities and can produce outcomes above typical talents for person of the same age in many domains but this ability can be the cause for improper reactions such as complexes like hyperactivity. Dabrowski's advice was to encourage parents, teachers, and therapists play to sustain responsiveness and deep appreciation in exchanges with child in the developmental capacities. Dabrowski encouraged profound consideration of a child's spirit central in educational preparation, parental guidance, and understated exchanges (Jackson & Moyle, 2009).

7. *Graphic Organizers* -- forms of concept maps or concept diagrams and are utilized to help students put thoughts in order during pre-writing (West Virginia Department of Education, 2014). Graphic organizers are used to present and organize thoughts to develop thinking skills, apply a sequence of images or icons so that students may develop and discern patterns, and present images to encourage creative writing skills. A graphic organizer can help students scaffold, or build on, thoughts in order to construct meaning (Lambert & Carpenter, 2005). When students utilize graphic organizers frequently, an increase in cognitive function occurs that can help students

apply a suitable diagram, or graphic organizer, to the learning task. Students can arrange information into patterns that are credible such as sequential events and cause and effect (West Virginia Department of Education, 2014). Brovero (2004) discovered that a concept web map would be appropriate for initial brainstorming; ideas may be written in a circle, and lines burst from the center like sunrays. Similarly, a character map may start by writing a character's name in a box drawing a line and then a rectangle and repeating, especially useful for creating chapters for autobiographies (Brovero, 2004). A sequencing process requires a flow chart; a step organizer shows a sequential order of events that make up a narrative tale (Brovero, 2004). A cause-and-effect chart involves a line of squares connected by arrows, showing stages of an imaginary narrative plot. A Venn Diagram with two circles that overlap is often used for compare and contrast issues (Lambert & Carpenter, 2005). Lambert & Carpenter concluded that gifted learners are especially aided by the use of graphic organizers because the voluminous thinking typical of gifted students may be reined in and organized. Graphic organizers were utilized in the research as part of the writing strategy compendium and used as an organizational and expansion tool after the initial brainstorming process. The specific graphic organizer operationalized in the study will be a concept web map in the shape of a sunburst, with main ideas in the center of the sun shape and associated detailed ideas branching out on the sunburst rays.

8. *Illustrative Art* -- a visual depiction or a conception made by an artist; media include drawing, painting, and other means. The artist creates an impression based upon real life, memory, or imagination (Wikipedia, 2014). Dunn and Finley (2010) found when art materials like paints markers, crayons, and clay were provided during the pre-writing

phase of composing a narrative, elementary students were able to note their story ideas visually before beginning writing. Hobson (2002) encouraged using of images to advance writing based on the premise that student ideas were easily stored in drawings. The students' drawings also offered a method of illustrating ideas to accompany the written narrative text that students produced (Dunn & Finley, 2010). Illustrative art will be used in the writing strategy compendium to deepen the possibilities of recall and increased cognitive function.

9. *Peer Feedback* -- adoption of the characteristics of superior work by assessing the work of their peers (National Capital Language Resource Center, 2004). McGroarty and Zhu (1997) used methods of peer feedback that directed language arts teachers to model specific questions to pairs of students in order to encourage students to generate specific kinds of responses between members of the pair group as part of a language arts creative writing workshop. Research conducted by the National Capital Language Resource Center revealed that students require a clear understanding of what the teacher expects students observe and communicate about peers' work. Before commencing a peer review exercise, teachers may model a practice review session wherein criteria for completing the assignment and precisely conveying feedback to a partner are clearly delineated. Of equal importance in developing successful peer review skills is a developed confidence in a supportive classroom environment. Trust may be developed by frequent and sensitive use of pair and group peer feedback throughout the classroom year (National Capital Language Resource Center, 2004). The present study incorporates teacher modeling of sample questions to pairs of students engaged in peer feedback during the writing arts compendium.

9. *Self-Assessment* -- engagement in purposeful thought methods of learning to help students become better writers. When responsibility is given to students to pick their own topics and how to write, diversity and depth is produced. When teachers trust students to show what they value, students are allowed to evaluate procedures and products (Rief, 1990). Nicol and Macfarlane-Dick (2006) asserted that self-assessment necessitates the student draw on prior knowledge and inner beliefs in order to create an individual interpretation of the task and requirements. If the teacher helps makes the task clear, students can use the stated objectives and outcomes to generate internal and external individual approaches. Teacher facilitation can aid the student in deciding if a particular line of evolution should carry on, or if the task should be revised. The student might even revise and amend knowledge or inspire views that could lead to a continuation of self-assessment (Nicol & Macfarlane-Dick, 2006). Students are enabled by self-assessment to think objectively about language arts approaches. Self-assessment promotes independence and motivation among writing students (National Capital Language Resource Center, 2004). Students were encouraged to evaluate writing methods and products during the writing strategy compendium.

10. *Teacher Feedback* -- a process by which a teacher provides detailed examples, concepts, and respectful critiques in order to improve student work. A factor of teacher feedback is the ability to motivate students to receive feedback in a positive manner in order to incorporate it into assignments. If teachers inspire students to attend to and incorporate feedback on future assignments, a sense of excitement and creativity may be discovered (Lee & Schallert, 2004). Van den Bergh, Ros, and Beijaard (2013) determined that providing feedback during student work time is imperative. Feedback

should be positive and delivered in the manner of a facilitator rather than as a critique. Focus on student meta –cognition and a specific final product is important, while considering a student’s thought processes and academic areas of challenge (Van den Bergh et al., 2013). The anticipated outcome of teacher feedback is to provide encouragement in order to sustain student motivation and sense of ownership of the writing. An emphasis on oral feedback represents a desire to be discrete and sensitive to students (Peterson & McClay, 2010). The writing strategy compendium will incorporate a positive and sensitive manner of oral feedback.

Summary

As exemplified in the National Association of Educational Progress assessment of 1998, 2007, and 2011, a majority of 70% of student writing scores remained at the *Basic* level or below, despite efforts on the part of the U.S. Department of Education to conduct teacher and student writing improvement strategies nationwide (U. S. Department of Education, 1999; U. S. Department of Education, 2002; U. S. Department of Education, 2011). Expertise in writing that makes use of complex cognitive function can benefit both narrative and non-fiction writing in all academic subjects. All domains of academic study require deep cognitive thought processes, including mathematics science, history, and social studies (Eckhoff & Urbach, 2008). If the writing skills of students of varied intelligence, cognitive function, and exceptionality can be improved through the administration of the writing strategy compendium lessons presented in this study, the research may benefit writing endeavor in all academic spheres.

Because the study has been conducted, researchers will be better able to continue valuable research that connects abstract reasoning skills to concrete results designed for

developing cognitive functions in writing. This information could help educators understand the necessity for creating alternative measures of cognitive development for students identified as exceptional as well as all students who may require remediation in certain areas. By determining student abilities in verbal, visual and numerical areas of cognition, educators could improve strategies of developing student knowledge in the areas of math, science, and humanities.

Chapter II included a description of the progress of students through levels of language arts understanding, including phonological awareness and word decoding (Essary, 2012; Fang, 1999; O'Donnell, 2002; Reading First Virginia, 2014; White, 2005). An explanation is detailed of the stultifying effects stiff rubrics and standards have had on student writing standards (Bourke & Adams, 2010; Hull & Bartholomae, 1986). A review of techniques used by teachers to help students develop cognitive power and language usage in students who are non-exceptional, exceptional, and twice-exceptional will be reviewed (Besnoy, 2009; Chang, Davies, & Gavin, 2009; Nicpon, Allmon, Sieck, & Stinson et al., 2011; Gilger & Kaplan, 2008; Karnes, Shaunessy, & Beland, 2004; Marsh & Hua, 2003; Neu, 2003; Parker & Boutelle, 2009; Ray, 1999; Reis & Sullivan, 2009; Schunk & Swartz, 1993; Schwartz & Cohen, 2013; Weyandt & DuPaul, 2008). Techniques include brainstorming, visual art, storybooks, symbolism, peer and teacher feedback, journaling, and graphic organizers (Kong & Hoare, 2011; Lee & Tan, 2010; Marteski, 1998; Read, 2010; Villa & Calvo, 2011; Wilson, 2007). In order to stimulate student imagination, teachers introduced themes of community collaboration, social justice, and real events of students' lives that were used as points of departure for

developing writing skills (Boldt et al., 2011; Cochrane, 2004; Davis, 2003; Essary, 2012; Hillocks, 1987; Olthouse, 2012).

CHAPTER II

REVIEW OF THE LITERATURE

An examination of research is imperative for understanding concepts that relate to several aspects of the writing process. The following divisions represent a continuum of writing process ideas: (a) early childhood writing, (b) effects of rubrics, (c) life experience and symbolism, (d) graphic organizers, (e) non-fiction domains and the making of meaning, and (f) exceptional students.

Early Childhood Writing

Essary (2012) found that the early writing of students was linked to symbolic drawing and scribbling. Creating symbols help students understand the complexity of language and surroundings (Essary, 2012). O'Donnell (2002) resolved that it is essential for students to have a vocabulary of word knowledge to pull up at any time. Students learn decoding skills in order to begin understanding language. Decoding helps students discover the meanings of new words in print. Word recognition of sight becomes progressively more understandable to the student (O'Donnell, 2002).

White (2005) used phonics extensively as a teaching practice. Phonics helped students relate knowledge to decode words not known. Practices included sequencing, daily lessons, review, and continued practice at a brief, easy pace, adjusted to the student individual levels of understanding. Differentiated instruction included letter-sound cards, phonics fish-card games, tongue twisters, creation of nonsense words, application of the words to poetry, and the use of technology and computer projections. O'Donnell (2002), analyzed reading records and the writing of elementary students during one school year. An intervention using 60 word-study lessons allowed third graders to progress from oral

language to phonemic awareness and vowel-spelling patterns. Each lesson had a specific purpose that increased student knowledge and awareness of vowel phonological-orthographic representations. The result of the highly focused series of lessons was an increase of phonological awareness and development of alphabetic principal awareness in the students (O'Donnell, 2002).

White (2005) conducted research about methods of teaching students to decode unknown words. Analogy-based phonics is a system for helping students ascertain the meaning of words not known and meaning from words that were known. White led research that utilized a collection of 150 written lessons designed to students learn to decode words using onset-rime instruction. The method focused on onsets, rimes, and orthographic expressions (editing elements of a particular language). Another goal of the program was to use the concept of “wall words” or 120 words that were used as base words for coding. The result was that the number of lessons completed correlated with students’ comprehension of language (White, 2005). Research by Hillocks (1987) involved thought chunks called “gist” units and proceeded from general idea to semantics, to lexile units (a numeral measure of reading ability), and finally to verbatim units interwoven into the sentences, at which point syntactic fluency (logical aspects of meaning) made significant progress. Students created more complex sentences when “gists” were combined into clauses and phrases that were interwoven into sentences (Hillocks, 1987).

Intervention techniques practiced in analogy research by White (2005) for struggling readers included rereading unfamiliar texts for five minutes, phonics instruction for five minutes, practicing decoding skills for five minutes, practicing new

words in isolation for five minutes, and writing for five minutes (White, 2005). Essary (2012) practiced techniques for intervention that used linguistic instruction to help students learn fluent patterns of language and meaning. Sensory-based lessons were used as direct instructional tools to teach phonics. Essary concluded that words used in context in an environment that included modeling of the lessons along with teacher scaffolding are effective tools in building student vocabularies.

Cognitive word processing begins at an early age, and early acquisition of language has many benefits for the student's academic career (White, 2005). Effective writing is based on knowledge of language. White developed strategies to help students learn language by cutting pictures from magazines making up stories, creating nursery rhymes, and encouraging students to make up words in order to play with the sounds and meanings and internalize the words. Fang (1999) concluded that early student development of writing including spelling development, early phoneme development, invented spelling, and drawing of random and letter-like units. A second field of interest is the use of symbolic forms and devices to represent experience (Fang, 1999).

Sociocultural aspects are links between writing and other forms of symbolic representation. Fang (1999) stated that writing is an "emerging object of research including spelling development, early phoneme development, invented spelling, and drawing of random and letter-like units" (p. 179). Young children develop gestures before developing speech, assimilating other students' speech, and interacting socially in order to develop language. Young students realize that speech is not the only form of communication (Fang, 1999).

Bourke and Adams (2010) determined that the memory system is improved by repeated practice. Students who possess extended memory recall produce complex grammatical structures and vocabulary. Visual strategies of coding are effective tools for improving the writing abilities of students. Fang (1999) resolved that student “textual products” and “linguistic codes” (p. 180) are often devalued by teachers and prevent attainment of a complete picture of student writing. Unintentional meanings of words are discovered and misunderstandings are examined. During the research conducted by Fang, students constructed meanings as they investigated the lives of families and other diverse students. Students collaborated to share experiences in art, poetry, and narrative (Fang, 1999).

Effects of Rubrics

Bartholomae and Hull (1986) concluded that when teachers issue rubrics for grading to students at the beginning of the writing assignment, results are unsatisfactory, as though the student wrote the piece with the rubric in mind, following the rubric without searching for content. Students tend to include only the specifics of the rubric needed to make good scores. Bourke and Adams (2010) conducted a study showing students have more difficulty writing to prescribed levels of standards (51%) than either in language and literacy (78%) or putting together sounds and symbols (61%) and reading (68%). Abilities to write depend on cognitive areas such as ability to recall memories, reading skills, and vocabulary. Writing is a task of complexity that involves several processes of interaction (Bourke & Adams, 2010).

Life Experience and Symbolism

Marteski (1998) concluded that the expansion of reflection processes that includes organization, revision, and structure helps the student improve cognitive thought processes. The processes connecting learning from the past benefit student writing abilities, both in the milieu of creative writing for language arts classes and in other formal domains. Eckhoff and Urbach (2008) wrote about cognition and the relation to creativity and imagination. Cognition is enhanced by the incorporation imaginative ideas into child development. Imaginative and creative thought are necessary elements for children's innovation and invention of imaginative writing. Any effective tool for stimulating student imagination requires appropriateness and interest for both formal and informal learning environments created by parents and teachers (Eckhoff & Urbach, 2008). Fang (1999) concluded that life experiences are often represented during writing exercises by the use of symbolic forms and devices. Students connect social and cultural aspects of life by using writing to develop symbolic images. Young children frequently draw and create new words and spellings of existing words (Fang, 1999).

A writing strategy created by Wilson (2007) that used positive mental processes and a search for meaning had a more positive effect on student writing than did assigning a rubric and fitting thoughts to a prescribed format. Marteski (1998) determined in that teacher feedback is an effective tool in improving student writing. An effective technique is for teachers to engage students in guided interviews. Kong and Hoare (2011) established a relationship between the engagement of a student in the writing process and the creation of new material. The pedagogy involved Content-Based Language Teaching (CBLT), a cognitive manner of learning and creating new material. Students who were

engaged interacted with learning in a deliberate careful fashion (Kong & Hoare, 2011). Teaching strategies that actively involve students in the writing process continue to engage students in the assessment process throughout peer feedback and self-assessment. When students learn to reflect on the relative merits of a piece of writing, creative processes, self-regulation, and active engagement with content are developed and are evident in the products of student writing (Kong & Hoare, 2011).

Graphic Organizers

Read (2010) developed a graphic organizing model that included a series of steps that incorporated investigation, displaying and example for the students by the teacher, writing that was shared among students, collective writing, and individual writing. The organizer was based on the concept of scaffolding students to independent writing. The inquiry step involves an investigation into a particular genre of reading, modeled by the teacher. The teacher models brainstorming topics and sometimes utilizes collaborations among students to work within a genre. Read in 2010 was able to release responsibility to the first and second grade students to write independently. The series of steps was repeated throughout the school year with the genres of memoir, non-fiction, and persuasive writing (Read, 2010).

Lee and Tan in 2010 developed a method of scaffolding that used graphic organizers to develop student writing. Lee and Tan completed a study of novice writers' organizers and mental difficulty questionnaires to discover how cognitive and intrinsic writing goals were perceived. Writing makes deep cognitive demands. Graphic organizers used by Lee and Tan included matrix organizers (with varied template designs), charting, and diagramming methods. The researchers theorized that the visual

form helps beginning writers with problem solving. The major objective of the class was to help students learn effective communication. The case study approach consisted of three stages. The first involved generating organizers based on the assignment and filling out a questionnaire after the lesson. The second step was to exchange organizers with a classmate of choice and determine the problems in the classmate's questionnaire. The third step involved finding solutions to the problems and completing a third questionnaire. Students were requested to use the feedback to improve personal organizers. Findings were that peer and teacher feedback accelerated improvement in idea relevance (Lee & Tan, 2010).

Formerly used in reading activities, Concept Mapping (CM) was implemented to increase cognitive thought processes during essay writing (Villa & Calvo, 2011). Students learned essay writing by processing information in symbolic representation of thoughts stimulated by CM to analyze language and statistical studies. Villa and Calvo concluded that writing activities support tasks involving the higher-order thinking skills of analysis and synthesis. Cognitive visualizations make thinking visible and aid in developing meta-cognition skills (learning methods to study and utilize optimally one's own thought processes). The concepts mapped by students in the study showed the current state of students' knowledge and presented concepts in a hierarchy wherein generalizations and specifics were grouped together. The tool helped students scaffold thoughts during writing, revision and editing. CM enabled students to visualize and observe mental processes. One of the major outcomes of the CM composition was that students could map a concept before using it as subject material. Students achieved an objective look at cohesiveness and cognitive content (Villa & Calvo, 2011).

Non-fiction Domains and the Making of Meaning

Hillocks in 1987 developed a program called “Calgary/Open Minds” involving both student and teacher participation as the main tenant. During the twentieth century, students lost touch with processes such as arts, crafts, and technology that were previously interwoven into students’ lives when communities were smaller. Before the program began, teachers met with individuals in the community at each of the nine sites and discussed curriculum strategies. Teachers took students to the sites and interacted with each one for a period of one week. The theory of the program was that journaling and drawing to describe experiences in a narrative approach make improvement and enrichment in writing. When a study was conducted contrasting the writing performances of the group with nonparticipants in a controlled study, few differences were noticed initially, but by the end of the year, the participants’ grades were improved in comparison to the control group by 26% (Hillocks, 1987).

Essary (2012) theorized that when members of the community collaborate with teachers and students in order to develop new writing content, student writing is enhanced. Essary conducted a research project that included several domains of knowledge. Domains were correlated encompassing the math of architectural construction. Included was a study of geography where students learned from a world map about the architecture of 11 well-known buildings all over the globe. Students progressed by keeping a journal of drawing and writing about the projects. The pictures aided the students in recollecting particulars about the elements of architecture studied. The teacher added lessons as necessary during the duration of the apprenticeship. The

teacher used scaffolding to decide the steps of the processes and design original structures (Essary, 2012).

Cochrane in 2004 used social justice issues as a strategy for teaching writing. Real events of a student's life as a point of departure for non-fiction writing based on current or past events produced improvement in writing. Genres suggested to the students were narrative accounts, poetry, and exposition. Genres represented issues of importance to students and to society. Students brainstormed about immediate surroundings and connected thoughts to the outside world based on current or past events. After a first draft was produced, students worked in small groups and used affirmation, critique, and critical thinking to expand ideas. The approach developed collaborative thinking, creativity, and academic skills, according to Cochrane (2004).

Boldt et al. (2011) stated that, "The best way to bring a broad array of students into powerful uses of writing required opportunities to build upon the diversity of language experience and interests they bring to classrooms" (p. 292). Boldt et al. concluded that when teachers paired with students to negotiate projects that related to the specifics of each other and the world in general, new ways of using language were developed. Boldt et al. (2011) focused on using the real events of a student's life as points of departure for writing based on current or past events. Students incorporated personal narrative within the writing. Suggested genres were narrative accounts, poetry, and exposition involving issues of importance. Students were encouraged to brainstorm areas in the immediate surroundings and to connect thoughts to the outside world. After the first draft was produced, the students worked in small groups to affirm and critique

the work. The writers used critical thinking to expand ideas. The approach built collaborative thinking, creativity, and academic skills (Boldt et al., 2011).

Examples from data analysis showed that arts-based vignettes used as themes for writing about visual arts experiences enhanced the creativity of the participants. (Eckhoff & Urbach, 2008) held that students' brains were able to put together past experiences and combine enriched experiences with visual stimuli to create writing that involved a depth of cognitive thought. Experiences gave the students a data bank of stimulating sensory experiences to draw upon in writing (Eckhoff & Urbach, 2008). During a model developed by O'Donnell (2002) for ages 4-11, writing teachers took students to visit the Denver Art Museum. An examination of the data retrieved from observation showed a purposeful relationship between examining and studying artwork and the production of complex thought (O'Donnell, 2002.)

Eckhoff and Urbach (2008) determined that students typically draw upon books and storytelling to create a reality of emotion and imagination. Internal and external perception involves disassociation during the process of thought creation. Basic to the production of art and writing is the choice the teacher makes to incorporate imaginative opportunities in the classroom. Students engage in material by emotive and imaginative experiences (Eckhoff & Urbach, 2008).

Olthouse (2012) felt that the emotions and self-identity of students is as important in academic writing as in creative writing. Restrictions due to the pressures of grades, assigned topics, and time to pursue writing are barriers to creativity in the production of student writing. Bernhardt (2009) discovered that an autobiographical practice used along with the study of world history produced socio-emotional benefits

and the recognition of a common history shared by the class. Interactive classroom activities included autobiographical reflection. The project was based on an inward exploration of students' life experiences. Bernhardt did not use a rubric or well-defined structure but wished students to guide individual progress through the unorthodox assignment. Students were asked to look into past and present histories in order to make connections with past experiences and those of classmates. Students decided how to structure and present the assignment. Bernhardt concluded that students were grateful to be able to express thoughts, feelings, and the way individual life experiences related directly to history (Bernhardt, 2009).

Davis (2003) directed a study about the engagement of students through social studies by conducting students in a writing strategy incorporating autobiographic recall of events with current events. Davis determined that because some stressful events emerged during the study, students often became defensive because of concerns about revealing too much about personal issues. Once private concerns were resolved, an ambience and a collaborative atmosphere developed in the classroom as students realized past history was reflected in present times. Students discovered there were relationships between the lived experiences of themselves, peers, and the world outside the classroom. The narratives that were developed engaged students in developing personal relationships, writing, and a depth of knowledge about social studies (Davis, 2003).

Boals (2012) theorized that a search for personal connection with emotion and meaning through writing enables students to find new value and self-esteem in life experiences. Researchers examined the language used in expressive writing. Results suggested that psychological and positive use of cognitive words, or word combinations

developed using reasoning abilities, is a result of expressive writing techniques. Boals (2012) focused on writing pedagogy during a period of research lasting for 20 years. The main tenant of research was the review process that takes place with any successful writing. The creation of personal narratives can bring a simple structural meaning to writing. Meaning making involves viewing the events of a students' life in a different way, while students attempt to make sense of events that often appear to be random at best. Boals concluded that a search for meaning in life events positively affects the emotions of students and increases the use of cognitive words in student writing.

Marteski (1998) found that creative and thought-provoking strategies such as autobiographical recall and a prolonged brainstorming process produce creative pieces of writing. During the process of research, students used cognitive writing strategies that related to an understanding of life processes, and underlying issues were brought to consciousness and used in positive ways. When students wrote about past life events that were low in components that might cause stress, students developed an understanding of meaning in life events and a further development of cognitive process measures (reasoning process methods). Important and sometimes traumatic life benefits were revealed and expressive writing was benefited (Marteski, 1998). Boals (2012) resolved that some students benefit from narrative autobiographical process while others benefit less. The reason for the inconsistency of results was the varied processing of events by students. Autobiographical recall was frequently shown to be an effective strategy in drawing out students' emotions and interests, often resulting in a broader vocabulary and an increasing use of sensual and descriptive detail (Boals, 2012).

Villa and Calvo (2011) determined that once students put thoughts on paper, students require objective feedback to determine whether the reader has been given appropriate and full information to interpret the text. Successful writing involves an understanding of the people and contexts in which the writing took place. Villa and Calvo discovered that automated and semi-automated feedback by peers and teachers could be incorporated to aid in the cognitive content of student work. Results of the research enabled Villa and Calvo (2011) to produce a successful model for providing feedback for students.

Exceptional Student Writers

A study conducted by Schunk and Swartz (1993) concerning the development of exceptional student writing showed that when students were given a goal of learning a specific writing strategy along with teacher feedback, accomplishment increased. Learning a specific writing strategy along with teacher feedback increased student development of methods of transmitting knowledge from writing to other subjects. Additionally, students were able to scaffold (building one skill level atop another) to develop individual and original writing strategies. Schunk and Swartz established that students who are merely presented with the goal of writing a paragraph may not develop a sense of importance about the writing lesson, but that presentation of new writing stratagems convince students that new learning strategies are taking place. Exceptional students commonly self-evaluate work progress, but determining whether writing skills are improving may be difficult for students unless given feedback by teachers and peers (Schunk & Swartz, 1991).

Gilger and Kaplan (2008) inferred that educators use limited insight into the varied aspects of the exceptional mind. Students who are exceptional have a variety of cognitive thought processes including a combination of strengths and weaknesses. Placement tests for exceptional students do not often evaluate critical thinking skills and the ability to use sound judgment.

Exceptional students accurately perceive subtleties in relationships between domains of information (Karnes & Bean, 2009). Studies by Marsh and Hua in 2003 investigated self-concept for students who are enrolled in curricula designed for students identified as exceptional. Mean scores of academic self-concept dropped during the attendance at schools especially for exceptional students. Marsh and Hua completed research that showed the mean assessment of academic self-concept for a sample population of students enrolled in exceptional studies dropped from 52.07 to 47.13 during the first year. Decreases among African American males and Hispanic males in academic self-concept were by far the greatest (Marsh & Hua, 2003),

Exceptional students with a combination of disabilities and high-abilities are often called *twice-exceptional* (Ray, 1999). Any disability enumerated in the Individuals with Disabilities Education Act (IDEA) that is not an intellectual disability might be present with exceptionality (Nicpon, Allmon, Sieck, & Stinson, 2010). Paradoxically, exceptional student abilities are sometimes paired with equally extreme weaknesses (Ray, 1999). Karnes et al. (2004) concluded that twice-exceptional students often demonstrate superior abilities in areas like problem-solving, abstract thinking, and creativity. Programmatic interventions show the importance of a curriculum that allows compensation for weaknesses while building on strengths (Karnes et al., 2004).

Exceptional students with disabilities should receive interventions that directly relate to the area of disabilities. A double set of needs makes teacher delivery of services to twice-exceptional students more difficult. Students often appear to be average learners because strengths and weaknesses cancel one another out (Nicpon et al., 2011).

Some twice-exceptional students who have learning problems are able to express thoughts in a highly complex, verbal manner, but are reading below grade level (Nicpon et al., 2011). Gilger and Kaplan (2008) concluded that students who have developmental Learning Disabilities (LD) but extreme skill in creativity and intellectual domains need to be accommodated in the classroom. Traditional methods may be combined by teachers with new ways of cognitive processing in order to understand that the brains of twice-exceptional students with intellectual difficulties may be looked at as a cohesive and multi-faceted structure (Gilger & Kaplan, 2008). Besnoy (2009) considered that many twice-exceptional students possess strong intellectual and abstract thinking skills that can be developed by strategies emphasizing meta-cognitive control, or the power to understand and organize one's own thought processes. Behaviors of defensiveness, disruption, anxiety, poor self-esteem, anxiety, seem to plague students who are gifted and concomitant learning disabilities; confidence in basic academic skills is often undermined (Besnoy, 2009).

One of the most prevalent learning disorders in the United States is Attention Deficit Disorder (ADHD). Schwartz and Cohen (2013) report that approximately 6.4 million children aged 4 through 17 have received a diagnosis of ADHD. The Centers for Disease Control reported that 11% of children of school age have received the diagnosis of attention deficit hyperactivity disorder, including almost one out of five high school

age boys. Statistics show an increase of 16% since 2007 and a 41% increase during the last 10 years (Schwartz & Cohen, 2013).

American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders* has recognized three main subtypes of ADD: (1) predominantly inattentive, (2) primarily hyperactive/impulsive, and (3) combined category (American Psychiatric Association, 2006). Weyandt and DuPaul (2008) deduced that when studies examined the two symptomologies of ADD and ADHD, hyperactivity/impulsivity and inattention, symptoms that are distracted seemed to have a greater influence in decreased grade point average (GPA) than does hyperactivity/impulsivity (Weyandt & DuPaul, 2008). Chang et al. (2009) asserted that ADD, whether or not inclusive of hyperactivity, is a frequently undiagnosed medical condition. There are abnormalities in the part of the brain that controls attention and executive function, possibly caused by functional and structural malfunctions in the frontal-striatal circuitry of the brain that affects executive functioning. The impairment is in cortical region in the brain, the regulation system monitors activity and impulse restraint (Chang et al., 2009). Executive functioning has been described by Parker and Boutelle (2009) as the cognitive functions of working memory, verbal knowledge, intricate problem solving, persistent attention, reaction inhibition, and continuous self-regulated behavior.

Students with ADD or ADHD may have difficulty setting plans, remembering goals, and dealing with the intensity of emotions while relating to daily living activities. This lack of self-regulation often manifests detrimentally in a student's ability to focus on objectives across periods of time. The student is unable to focus at times because of emotions such as frustration or keenly felt boredom (Parker & Boutelle, 2009). Weyandt

and DuPaul found little information about the processing of information related to the cognitive functioning and executive control that has to do with performance monitoring. Students diagnosed with ADD or ADHD with high symptoms of the condition report that they tend to procrastinate and use less discipline and methodical study than do their peers (Weyandt & DuPaul, 2008).

The disability that occurs second most frequently in the United States is Autism Spectrum Disorder. Sansoti (2010) found estimates of ASD's occurred in 1 in every 150 births, up from 4 to 6 per 10,000 five decades ago. The U. S. Department of Education (2011) estimates that the quantity of students with ASD who are obtaining services under the Individuals with Disabilities Education Improvement Act (IDEA, 2004) has increased greatly from 1993 to 2006. During 1990, there were only 4.8% of students diagnosed with ASD included in the general education classroom. By 2004, that percentage increased to 29.1% who spent more than 80% of their day in an inclusion environment. Crisman (2008) showed that percentage increased to almost 40% by 2006, according to the U. S. Department of Education (2011).

Autism Spectrum Disorders (ASD's, which include autism, Asperger's Syndrome, Fragile X Syndrome, Obsessive Compulsive Disorder, Pervasive Development Disorder (Friedlander, 2008), are caused by central nervous system malfunctions (Nicpon, Assouline, Schuler, & Amend, 2010). Most students with ASD have difficulty picking up social cues in their environment and forming relationships. A lack of "emotional reciprocity" (Friedlander, 2008, p. 141) causes the most impact in the classroom. Another area that causes difficulty in the general educational classroom is sensory input into the central nervous system, which causes extreme sensitivity in the

sensory areas of touch, taste, smell, or sound (Friedlander, 2008). Because the number of students with ASD has increased, teachers find it necessary to incorporate changes in the physical space of the classroom, presenting visual cues, and pairing them with peers in order to reduce or eliminate anxiety (Neu, 2003).

Students with ASD typically manifest a development disorder that causes communication and social interaction to be very difficult. The students often have advanced abilities in verbal and nonverbal skills, but have great difficulty processing information quickly. Students are very sensitive to change, sharing objects, and social interaction, and may behave in what appears to be an irrational manner (Neu, 2003). While students with ASD may interact socially with people that they know well, the appearance of a new people or stimuli will cause them great difficulty socially. Robison (2012) resolved that autism was primarily a communication disorder. An auditory conversation among non-exceptional students involves hand gestures, eye expressions, and the use of emotion. However, students with autism express in a literal manner, and have difficulty with idiosyncratic expressions, empathizing with others' emotions, writing, and expressing thoughts to others (Robison, 2012).

A wide range of disabilities is associated with the twice-exceptional child and general education teachers often have both exceptional and twice-exceptional students in the classroom. Common strategies used are minimizing challenged areas while maximizing areas of strength, and even utilizing challenged areas in ways that benefit the student. Many thought-provoking strategies have been made by teaching staff to elicit creative and cognitive behaviors with an interesting array of curriculum planning and strategic differentiation. An education for the twice-exceptional student should be

flexible and provide empowerment. Exceptional students require sensitive approaches delivered by teachers in order to utilize abilities to overcome disabilities and the necessary rigor to become successful. Essential are strategies that will help students achieve self-efficacy within a problem based subject areas. Especially important for teachers is to identify leaning styles and adapt metacognitive approaches to the classroom (Gregory, 2011). Behaviors contributing to success can be cultivated, and compensatory strengths should be encouraged. An environment that values differences in individuals can be created, as well as strategies to decrease inconsistent performance on tasks (Karnes et al., 2004).

According to Reis and Sullivan (2009), teachers often seem to depend on Bloom's taxonomy to organize thinking instruction. Students have evolved thinking skills that are never developed purposefully or even assessed and could not be fully explored using Bloom's taxonomy. Teachers of gifted students need to have the ability to help students apply thought processes to the practical solving of problems, as well as complex academic function (Karnes & Bean, 2009). Barnett and Francis (2011) envisioned higher level thought as the end of a continuum in opposition to memorization of facts and simple recall. Critical thinking is the directly hands-on aspect of higher order thinking. Critical thinking skills are the result of cognitive thought processes that do not involve simple memorization; critical thinking skills are the hands-on side of higher order thinking. The inherent characteristics present in the student can be encouraged by a teacher's attitude open-minded and inquisitive attitude (Barnett & Francis, 2011). Fundamental traits and abilities of students should influence the way critical thinking is taught; a cognitive development plan can be developed accordingly. Gregory (2011) determined that the

development of cognitive functions should be taught and imbedded in the teaching process in a very deliberate manner.

Gregory (2011) determined that it is necessary for teachers to identify learning styles of normal, gifted and twice-exceptional students in order to adapt a meta-cognitive approach to classroom practice. Cognitive development occurs when students interact with the environment. When novel approaches are employed to teach students, critical thinking improves. The abilities approach focuses on the learning behaviors that are required of the learner, including clarification, analysis, cognitive thinking, inference, and problem solving. The approach involves the ability to apply reasoning to support a position or argument (Gregory, 2011).

Barnett and Francis (2011) resolved that writing tasks involve an opportunity to use critical thinking. Writing assignments that require the student to deal with content in a new way, different from that taught in textbook or lecture, allow the range of creative and cognitive processes full range of expression (Barnett & Francis, 2011). Besnoy (2009) theorized that differentiated teaching of language arts had strong implications for exceptional students. Self-questioning strategies, prediction, and hypothetical thought processes are necessary to enhance textual perception. Although twice-exceptional students may have high-level skills of generating text, abilities to successfully transcribe writing (though considered a low-level skill) are often limited. Because of concurrent frustrations of exceptional students, low self-esteem in the areas of writing and language arts often develop. Besnoy (2009) determined that gifted students with learning disabilities have difficulty expressing and internalizing information; these complexities tend to endure over long periods of time. High levels of intellectual gifts make students

more aware of their own learning disabilities. Remediation in the area of low-level disabilities needs to take place in order for students to gratify rational cognitive functions.

According to Yssel, Prater, and Smith (2010), a series of six annual summer camps were held for twice-exceptional students in a Mid-western college town. The number of campers was limited to twenty for maximum interaction and assessment. The creators of the camp felt that, for the most part, the needs of twice-exceptional students were not being met in the classroom. The theme of the camp was enrichment-based, focusing on science and art, creative problems, critical thinking, reflection, and emotional and social well-being. Teachers considered the problems of remediation such as distractibility and organizational skills. Special interest was paid to the areas of instruction in writing, mathematics, homework skills, and studying strategies. A major part of the curriculum was based on language arts because the students had many imaginative ideas but had difficulty expressing what was known and how to use the knowledge in the region of expression. Students were encouraged to express abstract ideas through kinesthetic and sensory experiences in a concrete manner. Problems with written expression that might cause frustration and boredom were bypassed, and new avenues of expression were sought and found successfully (Yssel et al., 2010). Similarly, the Enrichment Triad Model developed by Renzulli (1977) for twice-exceptional students with learning disabilities utilized activities of investigation, training in groups, and individual and small group research. The Model incorporated skill development to produce new knowledge based on the educational strength and curiosity of the student (Renzulli, 1977).

A study conducted by Gould, Staff, and Theiss (2012) followed the school career of a young male student who had been identified as exceptional by a discerning teacher; the student needed support in the areas of writing instruction. The student was allowed to remain in the exceptional program (Challenge Program) and received remediation in areas of difficulty. Gould et al. determined that the student needed support in several areas:

- Writing accommodation—the student developed creative writing assignments on a word-processor, using the spell-check function of the word processor as an accommodation. Conferences with the Language Arts teachers were a requirement before the final copy was published. The student was allowed to test with vocabulary appropriate to the advanced level of the student’s understanding but consistent with the instructional level.
- Content Area accommodation—during hands-on activities, the student was allowed to participate along with classmates and needed no accommodation. For the reporting portion of the assignments, the student read and dictated selections to an adult (Gould et al., 2012).

According to Gould et al. (2012), the student’s exceptional programming in Language Arts was successful because comprehension instruction was decoded for the level of ability. The assignments were already differentiated for students identified as exceptional and simply differentiated a step further for the student in the area of Language Arts. Gould et al. (2012) concluded that accommodations should be made in the area of writing and communication throughout the academic day, and not just in the area of language arts (Gould, 2012).

Summary

Creating symbols helps young students understand the complexity of language and surroundings in order to develop a vocabulary for immediate access so that students may create complex sentences with clauses and phrases interwoven. Essential for developing a framework for spelling development is early phoneme development. Young students should be encouraged to invent meaningful spelling words and to draw random and letter-like units.

Student writing becomes unwieldy when students are presented with a rubric, causing them to work backward and produce work that is awkward. When students brainstorm by conducting a memory search, narrative development becomes descriptive and sensual. Expansion of reflection processes that include organization, revision, and structure helps students improve cognitive thought processes. The processes connecting learning from the past benefit student writing abilities, both in the milieu of creative writing for language arts classes and in other formal domains. Teacher and peer feedback is an effective tool in improving student writing. A relationship exists between the engagement of a student in the writing process and the creation of original material. Journaling and drawing describing real life experiences in a narrative approach make improvement and enrichment in writing. Real events of a student's life as a point of departure for non-fiction writing based on current or historical events produce improvement in writing.

Students encouraged to brainstorm areas in immediate surroundings may use results to connect thoughts to the outside world. When students work in small groups to affirm and critique the work, critical thinking skills develop, ideas are expanded, and

creativity develops. Organizers based on the concept of scaffolding students to independent writing and modeled by the teacher can produce work based on an inward exploration of students' life experiences. When students are asked to look into past and present histories in order to make connections with past experiences and those of classmates, students are sustained in decisions about structuring and presenting assignments. Correct usage of cognitive words by students is often a result of expressive writing techniques. Creative and thought-provoking strategies such as autobiographical recall and a prolonged brainstorming process produce creative pieces of writing; underlying issues are brought to consciousness and used in positive ways. Automated and semi-automated feedback by peers and teachers can be incorporated to aid in the cognitive content of student work.

When exceptional students were given a goal of learning a specific writing strategy along with teacher feedback, accomplishment increased, as did transmission of knowledge to others. Students are able to develop original writing strategies. Students who are exceptional have a variety of cognitive thought processes including a combination of strengths and weaknesses. Placement tests for exceptional students do not often evaluate critical thinking skills and the ability to use sound judgment. Twice-exceptional student abilities are sometimes paired with equally extreme weaknesses. Twice-exceptional students often demonstrate superior abilities in areas like problem-solving, abstract thinking, and creativity. Exceptional students with disabilities require interventions that directly relate to the area of disabilities.

A double set of needs makes delivery of services to twice-exceptional students difficult. Students often appear to be average learners because strengths and weaknesses

cancel one another out. Many twice-exceptional students possess strong intellectual and abstract thinking skills that can be developed by strategies that emphasize meta-cognitive control. Students with ADD typically manifest a development disorder that causes communication and social interaction difficulties. The students often have advanced abilities in verbal and nonverbal skills, but have great difficulty processing information quickly. Twice-exceptional students with ASD have difficulty expressing and internalizing information; those complexities tended to endure over long periods of time. Emergent approaches suggested that cognitive development occurs when students interact with the environment. When novel approaches are implemented by teachers, the critical thinking of students improves. The abilities approach focuses on the learning behaviors that are required of the learner, including clarification, analysis, cognitive thinking, and inference. Accommodations should be made in the area of writing and communication throughout the school day for all exceptionalities, and not just in the Language Arts classroom.

The review of literature created the basis for the purpose of this study. The mandate to increase writing scores to at least proficient level from the approximately 70 % of students in grades 4, 8, and 11 pointed out by results of the writing assessments dating 1998, 2007, and 2011. The importance of instructional strategies in writing will be presented as well as several strategies that have been presented successfully to students in recent decades.

Chapter III described the nature of the data collection instrument. The assessment measure of cognitive function was delivered to participants pre-intervention,

post-intervention, and delayed post-intervention. Research methods, participants, and locations of research were listed. The manner of data collection and research models was described.

A language arts writing intervention with art will be described that was presented to students who were exceptional and non-exceptional. An assessment measure of cognitive function was delivered to the participants before, immediately after, and at a maintenance phase (Lohman, 2012). Results of the assessments were examined and described.

CHAPTER III

METHODOLOGY

Introduction

The following section discussed the research design and methodology for the study about the effects of a writing strategy compendium on the learned cognitive function of two groups of students: exceptional and non-exceptional student participants of varying ages between 5 and 13. A review of pertinent material found few writing strategies that included autobiographical recall including the use of original artwork. Other writing strategies included scripted writing lessons, student choice of topics, autobiographical recall, review of art in museums and storybooks, varied and complex graphic organizers, peer feedback, teacher feedback, and self-assessment of materials both during and after the writing process. The researcher intended to add to the current literature and to produce innovative strategies for the improvement of writing programs in public and private schools for ages 5-13.

Fartoukh et al. (2012) conducted research to analyze the effects of emotion on complex cognitive process by using short-term autobiographical narrative writing. Cognitive progress was measured after each writing session. The interaction between emotional instruction and an emotional lexicon was significant in the number of words produced ($p < .001$). Fartoukh et al. concluded there may be specific connections between emotion and certain properties of writing and that autobiographical recall is an effective method of inducing emotional involvement. Fartoukh et al. (2012) conjectured that further investigation into effects of emotion in the study of writing might increase students' cognitive writing development.

Secondly, the research questions and hypotheses were stated. Thirdly, the population and sample were specified. Next, the data collection and instrumentation were examined. The researcher obtained the *Cognitive functions Test TM (CogAT®) Form 7 assessment* (Lohman, 2012) by qualifying as a licensed teacher through application to Riverside Publication in order to place an order. Licensure was granted by presentation of certified teacher's license by the researcher and issued by the State of Mississippi Department of Education in 2013. The three sections of the instrument – verbal, quantitative, and non-verbal, included nine subsections. The cognitive assessment instrument was used to measure verbal, quantitative, and non-verbal learned cognitive functions before the intervention, within a week after the intervention, and during a maintenance assessment that took place 4-5 weeks after the intervention. In order to insure fidelity of implementation of the lessons, the researcher appointed a graduate student to randomly visit the three locations to observe and report any changes in delivery of the lessons from the scripted writing strategy compendium.

Learned cognitive function was measured by the latest version (2012) of the *Cognitive functions Test TM (CogAT®) Form 7 assessment*, authored by David F. Lohman, University of Iowa. The sections and sub-sections were discussed in detail. Lastly, the data analysis was explained. Both hypotheses were analyzed using a Repeated Measures ANOVA, utilizing the SPSS statistical analysis (Cronk, 2008).

Problem and Purposes Overview

In the years since 1998, the United States Department of education focused on improving teacher training and student writing nationwide. The NAEP assessments of 1998, 2007, and 2011 showed that 70% of student writing scores remained at the *Basic*

level or below. Expertise in writing that made use of complex cognitive function benefitted both narrative and non-fiction writing in all academic subjects. All domains of academic study required the deep logical and reasoning abilities that were a part of cognitive thought processes. If the writing skills of students of varied intelligence, cognitive function, and exceptionality were improved through the administration of the lesson plans presented in this study, the research may benefit writing endeavors in all academic spheres.

By conducting this study, researchers will be better able to continue valuable research that connects abstract reasoning skills to concrete results designed for developing cognitive functions in writing. This information could help educators understand and develop creative alternative measures of writing development for students identified as exceptional as well as all students who may require remediation in certain areas. By determining student abilities in verbal, visual and numerical areas of cognition, educators could improve strategies of developing student comprehension in the areas of math, science, and humanities.

The writing strategy compendium was originally developed by the researcher to engage the attention of sixth grade language arts students in a public school in the southeastern United States. If the intervention increases cognitive ability for the participants, the clearly delineated lesson plans can serve as a tool for teachers to increase cognitive function during writing classes, after-school tutorials, workshops, and pull out programs for exceptional students.

The scripted writing lesson included the following:

- Brainstorming,

- autobiographical recall,
- illustrative art,
- graphic organizers,
- peer feedback,
- teacher feedback, and
- self-assessment.

An additional socio-emotional benefit to the students may be produced by the search for the meaning and an understanding of autobiographical events.

Research Questions and Hypotheses

Research questions and hypotheses were specified; the populations were described. Data collection and instrumentation were examined. Data were collected before the writing strategy “compendium” was implemented, within one week after the strategy was implemented, and 4-5 weeks after the strategy was implemented. The data were obtained by administering the *Cognitive functions Test TM (CogAT®) Form 7 assessment*. The purpose of the research was to describe the interaction between the learned cognitive function of students identified as exceptional and non-exceptional/twice-exceptional and the administration of a writing strategy involving autobiographical recall and art. School and/or parental consent was obtained prior to administration of assessment and writing strategy compendium.

Research Question 1: Does a writing strategy compendium improve learned cognitive function of students identified as exceptional/twice-exceptional and non-exceptional?

H₁: There was a significant difference between the learned cognitive function of exceptional/twice-exceptional and non-exceptional students pre-assessment,

post-assessment, and delayed post-assessment of *Cognitive functions Test TM (CogAT®) Form 7* assessment of cognitive functions.

Research Question 2: Does the administration of a writing strategy compendium increase the learned cognitive function of students among the following variables?

- d. Age
- e. Exceptionality/twice exceptionality
- f. Non-exceptionality

H₂: There was a significant difference between the learned cognitive function of students of exceptional/twice exceptional and non-exceptional abilities and varying ages after the administration of a writing strategy compendium.

Population and Sample

The population tested totaled 37 participants aged 5 to 13. There were 18 children who were exceptional and 19 children who were non-exceptional. A power analysis was performed to see whether there was a sufficient sample size to see differences given the number of variables, $n = 17-19$ per each of the 2 groups, with a stated alpha level of .05. After the analysis was performed, it was determined there was an 80% power to detect moderate differences at the .05 level with the 2 groups and 3 repeated measures with a sample size of 17-19 per group sample. Each of the two groups of students was identified as:

- Exceptional/Twice Exceptional—Students whose intelligence and/or talents deviate widely from a norm of physical or mental ability.
- Non-exceptional—Students whose range of intelligence falls within the 96% range of a normal bell curve of intelligence.

There were three repetitions of delivery of the intervention:

- Pre-assessment,
- Post-assessment, and
- Delayed post-assessment.

All students attend the public schools in Mississippi. The researcher contacted the parents of the children who took part in the research. Once the IRB permission was given to conduct research (see Appendix A), parents were contacted to arrange signing of parent consent forms and child assent forms and to arrange dates and times of testing by the researcher. Permission was requested at Moselle Elementary School to conduct research by sending a Letter of Introduction to the Principal (see Appendix B). A permission letter from Moselle Elementary School was granted (see Appendix B).

Locations of assessment were the following:

- For 4 of the students, the intervention and assessments were administered by a teacher at The University of Southern Mississippi (see attached consent form of teacher and assent form of students) in a classroom in the Department of Curriculum, Instruction, and Special Education at the University of Southern Mississippi (see attached consent form of parents and assent form of students, Appendix C).
- For 2 of the students, the intervention and assessments were administered at the office of a teacher at The University of Southern Mississippi (see attached consent form of teacher and assent form of students, Appendix B).

- For 23 of the students, the intervention and assessments were administered in a classroom in the Jones County Public School District (see attached permission of the Assistant Principal, Appendix B).

Once the study was completed, the researcher disseminated information to parents of the children and teachers through an Ability Profile engendered by the *Cognitive functions Test TM (CogAT®) Form 7 assessment* to help parents and the teachers who administered the assessments to understand cognitive abilities that have been uncovered through the assessments (Lohman, 2012). Lohman concluded that teachers should focus on students' scores on the three *Cognitive functions Test TM (CogAT®) Form 7 assessment* batteries for purposes of determining instruction design and domain emphasis for the optimal academic and cognitive functioning of the individual student. The Ability Profile identifies a pattern of scores to determine whether some scores are significantly higher or lower than others. The same pattern often has different connotations for instruction if the level assessment is low rather than high (Lohman, 2012). For the purposes of this research, only one composite score will be used. Each score was obtained by adding up the 3 subtest scores and dividing by 3 to obtain one mean score.

The study will examine the relationships of the following variables:

- Age—including age ranges from 5-12. What will be the interaction between the student's age and learned cognitive function after the administration of the intervention?
- Exceptionality/Twice Exceptionality—Students whose intelligence and/or talents deviate widely from a norm of physical or mental ability. These students intelligence usually falls within the outer 2% of a normal bell curve of

intelligence. What will be the interaction of the student's exceptionalism with learned cognitive function after the administration of the intervention?

- Non-exceptionalism—Students whose range of intelligence falls within the 96% range of a normal bell curve of intelligence. What will be the interaction of the student's normal intelligence with learned cognitive function after the administration of the intervention?

Data Collection and Instrumentation

The data collection methodology employed in this study was the *Cognitive functions Test TM (CogAT®) Form 7 assessment*. Before the first writing strategy compendium intervention took place (see scripted intervention in Appendix C), students were given the *Cognitive functions Test TM (CogAT®) Form 7 assessment*. Students were given three lessons and three assessments by three licensed teachers in the following locations:

- A sixth grade language arts classroom setting at Moselle Elementary School, and
- A classroom at the University of Southern Mississippi, to 4 students. Intervention and assessments were delivered by a licensed teacher at The University of Southern Mississippi, and
- The home of a licensed teacher at the University of Southern Mississippi, to children of the teacher, aged 6 and 8.

The intervention and assessments took place in the classrooms/home, with each new lesson administered within 7 days of the previous one. Each scripted lesson lasted for around 45 minutes. In order to insure fidelity of implementation of the lessons, the researcher appointed a graduate student to randomly visit the three locations to observe

and report any changes in delivery of the lessons from the scripted writing lesson compendium (Appendix B). Within 7 days after the intervention, an assessment took place using the *Cognitive functions Test TM (CogAT®) Form 7 assessment* that established learned cognitive function since the first assessment was administered. A maintenance assessment was given 4-6 weeks following the intervention to measure preservation of learned cognitive function.

The timeline was as follows:

- *Cognitive functions Test TM (CogAT®) Form 7 assessment* was administered,
- Within 4 weeks, the First Lesson of the writing strategy compendium intervention (see Appendix C) was administered,
- Within 7 days of the First Lesson, the Second Lesson was administered,
- Within 7 days of the Second Lesson, the Third Lesson was administered,
- Within 7 days after the Third Lesson was administered, a second *Cognitive functions Test TM (CogAT®) Form 7 assessment* was administered, and
- Between 4 to 6 weeks later, a maintenance assessment of the *Cognitive functions Test TM (CogAT®) Form 7 assessment* was administered.

In order to measure the results of the research, the *Cognitive functions Test TM (CogAT®) Form 7 assessment* instrument of determining cognitive function was selected after a thorough investigation of other methods of measurement. The latest rendition of the assessment, authored by David F. Lohman, University of Iowa, had the capability of incorporating *Cognitive functions Test TM (CogAT®) Form 7 assessment* scores with other information, such as achievement test scores and teacher ratings. The reliability for the factor loadings was represented by Cronbach alpha scores from the *Cognitive*

functions Test TM (CogAT®) Form 7 assessment Manual. Cronbach's α (alpha) is a coefficient of internal consistency and is often used as an approximation of the reliability of a psychometric test for a sample of participants. The internal consistency of the *Cognitive functions Test TM (CogAT®) Form 7 assessment* was determined by the University of Iowa to be a Cronbach alpha of .95 (Lohman, 2012).

The abilities measured were closely correlated to attainment in essentially all domains, and were available to teachers, parents in order to help plan effective instructional programs. A free guide for teachers was available on the Riverside Publishing site (Heuristic, 2002). In combination with other relevant information about a student, the assessment scores of the *Cognitive functions Test TM (CogAT®) Form 7 assessment* were tailored for adaptability of instruction in ways that improve the student's chances of academic success (Lohman, 2012).

The age range of the tests took into account the month the students entered school, since one student might be almost one year older or younger than another in the same grade. Each battery of three tests, Verbal, Quantitative, and Non-Verbal, contained 3 sub-tests in order to triangulate and extend results for each one of the three tests. A composite of the three tests was used to measure cognitive function. The types of scores utilized were:

- A composite, or total score, for all three batteries was summed and divided by 3.
- The number of correct answers was the raw score and was converted into a Universal Scale Score.

- Standard Age Score (SAS) was a normalized standard scale for each battery and its composite that was given to teachers and/or parents because of the understandable metric expressed in percentile points.
- Stanines, similar to percentile ranks, gave a broad grouping score.

Percentile ranks, SAS scores, and stanines reported for each battery, offered three ways to compare an individual's performance on *CogAT 7* and were transposable.

Composite scores offered three ways to compare an individual's performance on *Cognitive functions Test TM (CogAT®) Form 7 assessment* and were interchangeable (see Table 2). All scoring was based on a collection of all 3 batteries.

The *Cognitive functions Test TM (CogAT®) Form 7 assessment* was designed to measure a complete selection of reasoning ability in order to define general fluid reasoning (Carroll, 1993; Lohman & Lakin, 2009). The three factors that delineated general fluid reasoning are the following:

- Sequential reasoning, including verbal, logical, or deductive reasoning with the use of quantitative concepts,
- Quantitative reasoning, included inductive or deductive reasoning with the use of quantitative concepts, and
- Inductive reasoning, with the use of measured figural tasks.

The factors explained paralleled the following three *Cognitive functions Test TM (CogAT®) Form 7 assessment* batteries: verbal reasoning, quantitative reasoning, and non-verbal reasoning. Each battery of the subtests used different test formats to increase both the fairness and validity of obtained scores. Once scores were determined, scores

were interpreted by relative strengths and weakness in each of the three testing areas of cognitive function (Lohman, 2012).

The three subtests of the Quantitative Battery were Number Series, Number Analogies, and Number Puzzles. The latter was a novel format that obliged students to decide the value of variables in number sentences (i.e., calculations). The three subtests of the Nonverbal Battery were Figure Classification, Figure Analogies, and Paper Folding. Students read specific words on two subtests of the Verbal Battery (Verbal Analogies and Verbal Classification) and a sentence on the third (Sentence Completion).

The test was given in paper-and-pencil format. The following text represents examples of the 3 categories under each main section of Verbal, Quantitative, and Nonverbal (Lohman, 2012):

- Session 1: Verbal Battery
 - Test 1: Verbal Classification,
 - Test 2: Sentence Completion,
 - Test 3: Verbal Analogies,
- Session 2: Quantitative Battery
 - Test 4: Quantitative Relations,
 - Test 5: Number Series,
 - Test 6: Equation Building,
- Session 3: Nonverbal Battery
 - Test 7: Figure Classification,
 - Test 8: Figure Analogies, and
 - Test 9: Figure Analysis.

Once the assessment was concluded, a Student Profile was generated that:

- Reported each student's raw scores, comparing of the scores to those of other students of the same age (Standard Age Score, Age Percentile Rank, and Age Stanine), and a comparison to other students in the same grade (Grade Percentile Rank and Grade Stanine),
- Provided a descriptive interpretation of each student's scores,
- Presented an Ability Profile of each student based on a pattern of age-normed scores and
- Materials keyed to teaching suggestions that included confidence bands around scores unique for each student on each battery.

An extended Ability Profile contained the results of the assessment. Once the results of all assessments were made available by Riverside Publishing, the researcher made the Profiles available to the teachers and/or parents who participated in the study. The Ability Profile contained instructional strategies and resources related to the needs of the student as indicated by the assessment.

Participants in the study are listed below by alphabetical code. Participants ranged from ages 5 through 13. Participants have been identified as Exceptional (Ex), Attention Deficit Disorder (ADD), Attention Deficit Hyperactive Disorder (ADHD), Autism Spectrum Disorder (ASD), and Non-Exceptional (Non-Exceptional).

Table 1

Characteristics of Participants

Student	Age	Gender	Identification
Group 1			
A	6	M	Ex
B	8	M	Ex
C	10	M	Ex
D	11	F	Ex
D	11	M	Ex
E	11	M	Ex
F	12	M	Ex
G	11	M	Ex
H	12	M	Ex
I	11	M	Ex ASD
J	12	M	Ex
K	12	F	Ex
L	11	F	Ex
M	11	F	Ex ADHD
N	12	F	Ex ADHD
O	13	F	Ex ADHD
P	11	M	Ex ADD
Q	12	M	Ex ASD
Group 2			
A	07	M	Non-Ex
B	07	M	Non-Ex
C	12	M	Non-Ex ADHD
D	11	M	Non-Ex ADHD

Table 1 (continued)

E	12	M	Non-Ex
F	11	F	Non-Ex
G	12	F	Non-Ex
H	12	F	Non-Ex ADHD
I	12	F	Non-Ex
J	11	F	Non-Ex
K	13	M	Non-Ex
L	13	M	Non-Ex
M	12	M	Non-Ex
N	12	F	Non-Ex ASD
O	13	F	Non-Ex
P	13	F	Non-Ex
Q	16	F	Non-Ex ASD

Data were collected in a sequence of three points in time. The treatments were assigned to experimental units i.e., subjects. The two factors were the treatment: between-subjects factor and time. That is, response variables for each level of within-subject factor were assumed to be different dependent variables. Studies investigated changes in mean scores over three or more time points.

Data Analysis

Data were analyzed by a repeated-measures (related factorial) ANOVA design. Several independent variables were measured. The Repeated Measures ANOVA was a statistical analysis wherein the same individuals within a study were measured across a condition of the study (Field, 2009) at an alpha level of .05. The repeated-measures ANOVA expanded the basic ANOVA structure to a within-subjects independent

variable. Cognitive function was assessed by the *Cognitive functions Test TM (CogAT®) Form 7 assessment*. The participant data were more than one level of an independent variable (Cronk, 2008). Two groups of participants were measured using the same dependent variable. Variance was explained due to differences in group means and differences due to individuals over time. One dependent variable was measured using the same participants using a two-way repeated-measures ANOVA. The research looked at the effect of one dependent variable. The dependent, or outcome, variable was the cognitive function of two groups of participants of varying age and identification, exceptional and non-exceptional. The independent, or predictor, variables were the writing intervention and the points in time. The second independent variable, time, was systematically manipulated by assigning participants to different conditions: pre-, post-, and delayed-post assessments.

Assumptions of a Repeated Measures ANOVA were normality and independence (Field, 2009). Assumptions for the assumption of independence:

- Both the post hoc test and F-test in ANOVA were dependent on the assumption that the scores of the assessment were independent of one another.
- This assumption will likely be violated because scores obtained or measured at later points in time are likely dependent on the scores obtained at earlier points in time.
- In order to work around this violation of the assumption of independence, Repeated Measures ANOVA rests on the assumption of Sphericity rather than independence.
- Sphericity assumed that:

- The relationship (s) between pairs of experimental conditions was similar.
- The differences between pairs of scores had approximately equal variances (similar to homogeneity of variance) (Field 2009).

Sphericity was examined using Mauchly's test. The test was interpreted similarly to Levene's test of homogeneity of variance. The closer the epsilon estimate was to 1 over the "lower bound", the closer the data were to meeting the assumption of sphericity (Field, 2009). Within-subjects contrasts were evaluated to see whether the effect of this study came primarily from the administration of the writing strategy intervention compendium.

The between effects were recorded in order to make a corrected repeated measures ANOVA table so that the effects between subjects (exceptional and non-exceptional, with subjects (times), and any residual or error variance within (Algina & Keselman, 1997; Davidson, 1972).

The two groups were compared:

- Effects of times of assessment (pre- post-, and delayed-post) of Group 1: Exceptional (N =18), and
- Effects of times of assessment (pre- post-, and delayed-post) of Group 2: Non-Exceptional (N= 19).

Results were reported by breaking out the variance into two parts, required for a repeated measures ANOVA; variance was explained by groups and variance was explained by differences among individuals over time. An analysis of covariance, or ANCOVA, was conducted to adjust for the ages of the participants and determined

unique or shared relationships, i.e., exceptionality/twice-exceptionality, among the independent variables.

Given that the intervention was delivered by 3 different teachers/settings, a hierarchical regression was considered as a model to see whether there were differences among the 3 different teachers/settings. However, the small sample size did not lend itself to regression, since regression is insensitive to the variance the researcher was attempting to explain. Because the variables of 3 different teachers/settings have the potential to be related to the outcome variable being measured, cognitive function, an analysis of covariance was conducted using SSPS and examined to try to control for extraneous variance.

Summary

Chapter III described the nature of the data collection instrument. The assessment measure of cognitive function was delivered to the participants pre-intervention, post-intervention, and delayed post-intervention. Research methods, participants, and locations of research were listed. The manner of data collection and research models was described.

This section analyzed what types of data were collected in this study, how the data was collected, who participated in the study, and how the data was analyzed. The details regarding the participants and data collection have been reviewed and included students who voluntarily took part in the study once the elements of the research were explained to the students and their parents. Next, the students signed a letter of assent, the parents signed a letter of consent, and the principal's permission was obtained. Features of the chosen instrument that assessed cognitive, or reasoning, abilities were explored with specific details given about the individual elements of the instrument and

subsequent analysis of individual students. Data analyses included a repeated measures ANOVA analysis.

RESULTS, CONCLUSIONS, AND LIMITATIONS

Overview

This chapter contains descriptive information about the participants in the study and the results of a within-subjects two-way repeated measures ANOVA and an analysis of covariance of data. Results were reported by breaking out the variance into two parts, required for a repeated measures ANOVA; variance was explained by groups and variance were explained by differences among individuals over time. An analysis of covariance, or ANCOVA, was conducted to adjust for the three teachers of three separate groups in 3 settings who administered the *Cognitive functions Test TM (CogAT®) Form 7 assessment* pre-intervention, the writing strategy compendium presented in a series of three lessons, the post assessment of *Cognitive functions Test TM (CogAT®) Form 7 assessment*, and the delayed post assessment of the *Cognitive functions Test TM (CogAT®) Form 7 assessment*.

Originally, the researcher intended to analyze the data using the independent variables of the disabilities of ADHD and Autism that were found within both the exceptional and non-exceptional participants. Because of an experimental mortality of differential loss of subjects rate, there were too few participants with the disabilities of ADHD and Autism, hence a lack of statistical power, and an ANOVA and analysis of covariance was not conducted for the independent variables, the disabilities of ADHD and Autism.

The between effects were recorded in order to make a corrected repeated measures ANOVA table so that the effects between subjects (exceptional and non-

exceptional, with subjects (times), and any residual or error variance within (Algina & Keselman, 1997; Davidson, 1972).

The two groups were compared:

- Effects of times of assessment (pre- post-, and delayed-post) of Group 1: Exceptional (n =18), and
- Effects of times of assessment (pre- post-, and delayed-post) of Group 2: Non-Exceptional (n= 19).

The analyses of data were related to the testing of research hypotheses. The chapter represents the results of the analysis conducted to determine if the writing strategy compendium increased the cognitive function of students of varying ages and exceptionalities after the administration of a writing strategies compendium using autobiography and illustrative art.

Presentation of Descriptive Characteristics of Participants

Participants included a total of 37 students; 18 students were identified as exceptional and 19 students were non-exceptional. All were enrolled in the elementary public school systems of Mississippi. Distribution of students by age, exceptionality, and disability is presented in Table 1. Distribution of participants by exceptionality and disability is presented in Table 2.

Table 2

Distribution of Participants by Exceptionality and Disability

Exceptional	ADHD	Autism	Non-Exceptional	ADHD	Autism
18	5	1	19	4	2

The data collection methodology employed in this study was the *Cognitive functions Test TM (CogAT®) Form 7 assessment*. Before the first writing strategy compendium intervention took place (see scripted intervention in Appendix C), students were given the *Cognitive functions Test TM (CogAT®) Form 7 assessment*. Students were given three lessons from the writing strategy compendium and three assessments by three licensed teachers in the following locations:

- A sixth grade language arts classroom setting at Moselle Elementary School, delivered by a teacher licensed by the state of Mississippi.
- A classroom at the University of Southern Mississippi, delivered by a licensed teacher at The University of Southern Mississippi.
- The home of a licensed teacher at the University of Southern Mississippi, to children of the teacher.

Fidelity Measures

The intervention and assessments took place in the classrooms/home/office, with each new lesson administered within 7 days of the previous one. Each scripted lesson lasted for around 45 minutes. In order to insure fidelity of implementation of the lessons, the researcher appointed a graduate student to randomly visit the three locations to observe and report any changes in delivery of the lessons from the scripted writing lesson compendium (Appendix C).

Within 7 days after the intervention, an assessment took place using the *Cognitive functions Test TM (CogAT®) Form 7 assessment* that established learned cognitive function since the first assessment was administered. A maintenance assessment was

given 4-6 weeks following the intervention to measure preservation of learned cognitive function.

The timeline was as follows:

- *Cognitive functions Test TM (CogAT®) Form 7 assessment* was administered,
- Within 4 weeks, the First Lesson of the writing strategy compendium intervention (see Appendix C) was administered,
- Within 7 days of the First Lesson, the Second Lesson was administered,
- Within 7 days of the Second Lesson, the Third Lesson was administered,
- Within 7 days after the Third Lesson was administered, a second *Cognitive functions Test TM (CogAT®) Form 7 assessment* was administered, and
- Between 4 to 6 weeks later, a maintenance assessment of the *Cognitive functions Test TM (CogAT®) Form 7 assessment* was administered.

Dates of the assessments and scripted interventions were as follows:

- The sixth grade language arts classroom teacher administered the first *Cognitive functions Test TM (CogAT®) Form 7 assessment* on October 28, 2014. Within a month, as required by the timeline, the 3 (see Appendix C) writing strategy compendium lessons took place on October 31, November 6, and November 12, each lesson taking place within 1 week of the previous lesson, as required by the timeline. The second *Cognitive functions Test TM (CogAT®) Form 7 assessment* was delivered on November 18, 2014, within 1 week of the last lesson. The final *Cognitive functions Test TM (CogAT®) Form 7 assessment* took place on January 8, 2015, between 4-6 weeks after the last writing strategy compendium lesson took place. The timeline was followed precisely as requested of the teacher by

the researcher. The fidelity measures implemented required that a graduate student visit the 3 teachers in the 3 locations randomly. A graduate student observed the third scripted writing lesson on November 12, 2014. The graduate student reported that the public school teacher had followed the script of the writing lesson strategy compendium exactly, word for word, and

- The second teacher, who was licensed by and teaching at The University of Southern Mississippi, administered the first *Cognitive functions Test TM (CogAT®) Form 7 assessment* on October 23, 2014. Within a month, as required by the timeline, the three writing strategy compendium lessons took place on November 13, 2014 November 19, 2014 and November 22, 2014, each lesson taking place within 1 week of the previous lesson, as required by the timeline. The second *Cognitive functions Test TM (CogAT®) Form 7 assessment* was delivered on November 28, 2014, within 1 week of the last lesson. The final *Cognitive functions Test TM (CogAT®) Form 7 assessment* took place on January 8, 2015, within 4-6 weeks after the last writing strategy compendium lesson took place. The timeline was followed precisely as requested of the teacher by the researcher. The fidelity measures implemented required that a graduate student visit the 3 teachers in the 3 locations randomly. A graduate student observed the third lesson on November 13, 2014. The graduate student reported that the teacher had followed the script of the writing lesson strategy compendium exactly, word for word.
- The third teacher, who was licensed by and teaching at The University of Southern Mississippi, administered the first *Cognitive functions Test TM*

(CogAT®) Form 7 assessment on October 25, 2014. Within a month, as required by the timeline, the three writing strategy compendium lessons took place on November 19, November 25, and November 30, with each lesson taking place within 1 week of the previous lesson, as required by the timeline. The second *Cognitive functions Test TM (CogAT®) Form 7 assessment* was delivered on December 2, 2014, within 1 week of the last lesson. The final *Cognitive functions Test TM (CogAT®) Form 7 assessment* took place on January 11, 2015, within 4-6 weeks after the last writing strategy compendium lesson took place. The timeline was followed precisely as requested of the teacher by the researcher. The fidelity measures implemented required that a graduate student visit the 3 teachers in the 3 locations randomly. A graduate student observed the third lesson on November 19. The graduate student reported that the teacher had followed the script of the writing lesson strategy compendium exactly, word for word.

In order to measure the results of the research, the *Cognitive functions Test TM (CogAT®) Form 7 assessment* instrument of determining cognitive function was selected after a thorough investigation of other methods of measurement. The latest rendition of the assessment, authored by David F. Lohman, University of Iowa, had the capability of incorporating *Cognitive functions Test TM (CogAT®) Form 7 assessment* scores with other information, such as achievement test scores and teacher ratings. The reliability for the factor loadings was represented by Cronbach alpha scores from the *Cognitive functions Test TM (CogAT®) Form 7 assessment* Manual. Cronbach's α (alpha) is a coefficient of internal consistency and is often used as an approximation of the reliability of a psychometric test for a sample of participants. The internal consistency

of the *Cognitive functions Test TM (CogAT®) Form 7 assessment* was determined by the University of Iowa to be a Cronbach alpha of .95 (Lohman, 2012).

All participants completed the entire protocol, including pre-intervention cognitive assessment by *Cognitive functions Test TM (CogAT®) Form 7 assessment*, three writing strategy compendium lessons including autobiography and illustration, post-intervention assessment by *Cognitive functions Test TM (CogAT®) Form 7 assessment*, and delayed post-intervention assessment by *Cognitive functions Test TM (CogAT®) Form 7 assessment*.

Research Questions and Associated Hypotheses

Two research questions and two hypotheses explored the efficacy of a writing strategy compendium in improving verbal, non-verbal, and quantitative cognitive, or reasoning, function in exceptional and non-exceptional students.

Research Question 1: Did a writing strategy compendium improve learned cognitive function of students identified as exceptional and non-exceptional?

H₁: There was a significant difference between the learned cognitive function of exceptional/twice-exceptional and non-exceptional students pre-assessment, post assessment, and delayed assessment by *Cognitive functions Test TM (CogAT®) Form 7 assessment* of cognitive functions.

Research Question 2: Did the administration of a writing strategy compendium significantly increase the learned cognitive function of students among the following variables?

- a. Age
- b. Exceptionality/twice exceptionality

c. Non-exceptionality

H₂: To what degree did the administration of a writing strategy compendium alter learned cognitive function of students according to the following variables:

- Age
- Exceptionality/twice exceptionality
- Non-exceptionality

Analysis of Data

This section contains the results obtained from testing the hypotheses of the study. Each hypothesis is restated followed by a reporting of the determination of the decision that was made and the magnitude of the effect according to the hypotheses that were tested. Because the ANOVA is repeated measures and the scores measured during later points in time are likely to be dependent on scores obtained at earlier points in time with the same participants, the Repeated Measures ANOVA rests on the assumption of Sphericity rather than independence.

Sphericity was examined using Mauchly's test (Table 3). The test was interpreted similarly to Levene's test of homogeneity of variance. The closer the epsilon estimate was to 1 over the "lower bound", the closer the data were to meeting the assumption of sphericity (Field, 2009). Sphericity demonstrated a near perfect sphericity (Mauchly's $W = .991$) with a perfect Mauchly's $W = 1.000$). An additional sphericity test was included, the Greenhouse-Geisser, which demonstrated a .991 sphericity. Within-subjects contrasts were evaluated to see whether the effect of this study came primarily from the administration of the writing strategy intervention compendium. Descriptive statistics of participants and assessment times are described in Table 4

Table 3

Mauchly's Test of Sphericity

Within Subjects Effect	Mauchly's W	App. Chi-Square	df	Sig.	Greenhouse-Geiser
Time	.991	.307	2	.858	.99

Table 4

Descriptive Statistics of Participants and Assessment Times

	Exceptionality	Mean	Standard Deviation	N
Pre-assessment	0	94.84	14.584	19
	1	117.81	13.064	21
	Total	106.90	17.905	40
	0	100.00	13.098	19
	1	121.52	13.578	21
	Total	111.30	17.094	40
Delayed post-assessment	0	99.95	16.585	19
	1	117.00	16.811	21
	Total	108.90	18.608	40

Scale: 0 = exceptional 1 = non-exceptional

H₁: There was a significant difference between the learned cognitive function of exceptional/twice-exceptional and non-exceptional students pre-assessment, post assessment, and delayed assessment of *Cognitive functions Test TM (CogAT®) Form 7 assessment* of cognitive functions.

The dependent measure in Hypothesis 1 is pre-assessment, post-assessment, and delayed post-assessment. The independent or between subjects variables are exceptional and non-exceptional students with exceptional students coded as 1 and non-exceptional students coded as 0. Results of a between-subjects two-way repeated measures ANOVA and covariance analyses of data revealed that there was a statistically significant difference between the scores of exceptional and non-exceptional students with an $F(1,34) = 7.532, p = .010, p < .001$. Exceptional students scored significantly higher than non-exceptional students. When a covariance was conducted to determine the effect that teachers had on the scores of the three groups of students, it was found that the effect of teachers/settings was not significant with an $F(1,34) = 2.885, p = .070$. There was an effect nearing significance, but was not significant (see Table 6). Group by time interaction was not significant (see Table 5); therefore the slopes of the lines in the illustrated graph (Illustration 1) are not statistically different.

Table 5

Between-Subjects ANOVA Summary Table

Source	SS	df	MS	F	<i>p</i>
Intercept	158344.799	1	158344.799	249.795	.000
Teachers	3022.991	1	3022.991	4.769	.036
Exceptionality	4774.358	1	4774.358	7.532	.010
Error	21552.545	34			

H₂: There was a significant difference between the learned cognitive function of students of exceptional and non-exceptional abilities and varying ages after the administration of a writing strategies compendium.

Because of experimental mortality of differential loss of subjects and an additional of new subjects, the majority of participants were aged 11, and there was not a sufficient number of participants to obtain the power necessary to conduct a mixed measures ANOVA with the independent variable of age.

Results of a within-subjects two-way repeated measures ANOVA excluding the variable of age showed that scores were consistently higher on post-assessment grades as compared to pre-assessment grades for both exceptional and non-exceptional. As assessment scores go from pre to post, assessment scores increase. There is a statistically significant difference between pre-assessment to post-assessment to delayed post-assessment (see Table 6).

Table 6

Within-Subjects ANOVA Summary Table

Source	SS	df	MS	F	<i>p</i>
Time	414.224	2	207.112	4.961	.013
Time/Teachers	240.814	2	120.407	3.257	.070
Time/Exceptionality	150.691	2	75.345	2.038	.129
Error	2513.636	68	35.965		

There was a significant main effect of the CoGAT 7 assessment on cognitive function from the pre-assessment to the post-assessment, $F(2,33)$, $p = .013$. There was

not a significant effect of the CogAT7 between the post-assessment to the delayed post-assessment, $F(2,33) = 2.185, p < .129$.

There was not a statistically significant ($p < .05$) increase from post-assessment to delayed-post assessment. Once assessment scores rise, scores do not significantly decline. There is no interaction between Group 1 and Group 2. Pre post and delayed post behaved the same for both groups of participants. The writing treatment did not work better for the exceptional students than for non-exceptional students.

The mean of exceptional scores increased from 115 to 120.5 to 117. The mean of non-exceptional scores increased from 99 to 102.5 to 103. Student scores did not significantly decline at the post-assessment, and scores of non-exceptional students actually rose slightly from post-assessment to delayed post-assessment (see Table 7).

The writing strategy compendium treatment was effective in improving the cognitive function of the participants. Cognitive function increased from pre-assessment to post-assessment and did not significantly decrease from post-assessment to delayed post-assessment, in both exceptional and non-exceptional groups of participants.

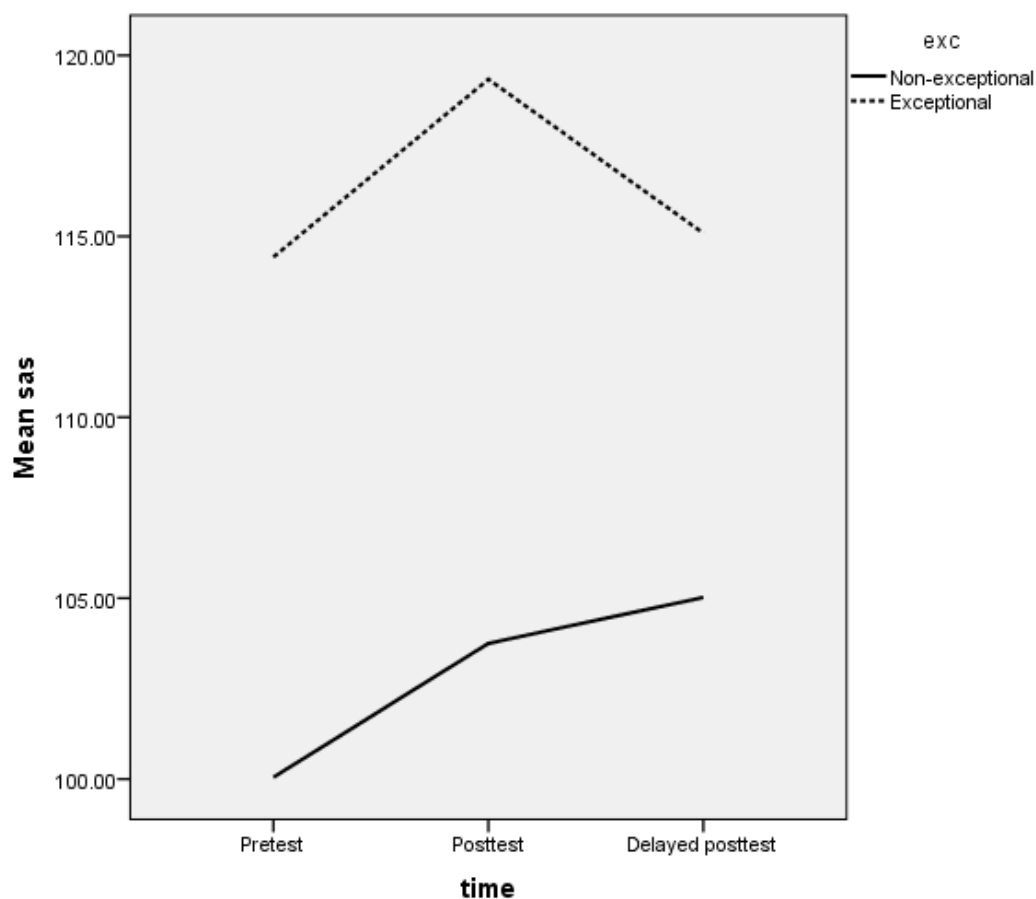


Figure 1. Graph of Mean Scores and Assessment Times. The dotted line indicates the scores of exceptional participants during the following times: pre-assessment, post-assessment, and delayed post-assessment. The solid line indicates the scores of non-exceptional participants during the same three time periods.

Conclusions

The writing strategy compendium treatment was effective in improving the cognitive function of the participants. Cognitive function increased from pre-assessment to post-assessment and did not significantly decrease from post-assessment to delayed post-assessment, in both exceptional and non-exceptional groups of participants.

Hypotheses₁: The answer to the hypothesis is yes, there was a functional relationship between the learned cognitive function of exceptional/twice-exceptional and non-

exceptional students pre-assessment, post assessment, and delayed assessment of *Cognitive functions Test TM (CogAT) Form 7* assessment of cognitive function.

Hypothesis 2: There was a significant difference in the learned cognitive function of students of exceptional and non-exceptional abilities and ages after the administration of a writing strategies compendium.

The independent variable age was not compared because of a lack of sufficient numbers available in the variable. The cognitive function of both groups increased significantly after the administration of a writing strategies compendium. Delayed post-assessment did not produce a statistically significant improvement from the initial assessment.

Summary

A language arts writing intervention compendium was delivered to students identified as exceptional and non-exceptional. An assessment measure of cognitive function was delivered to the participants pre-intervention, post-intervention, and delayed post-intervention to determine whether there was a statistically significant difference between the scores of exceptional and non-exceptional students. A statistically significant difference was found between the learned cognitive function of exceptional/twice-exceptional and non-exceptional students pre-assessment, post assessment, and delayed assessment of *Cognitive functions Test TM (CogAT®) Form 7 assessment*.

Results of the study revealed that the administration of a scripted three-lesson writing strategy compendium made a statistically significant difference in the learned cognitive function of both exceptional and non-exceptional students from the pre-

intervention to post-intervention. Non-exceptional students showed a continued increase in cognitive function after the post-intervention assessment and before the delayed post-intervention assessment took place. Exceptional students showed a slight overall improvement in cognitive function from the pre-assessment to the delayed post-assessment (Lohman, 2012). Chapter V will present the findings, conclusions, and implications of the study.

CHAPTER V

FINDINGS, CONCLUSIONS, AND IMPLICATIONS

Introduction

The five sections in the chapter include the Summary of the Study, which includes the following: a synopsis of the entire study, a review of the problem, the type of material that was collected, the restated research questions, an abridgment of the contents of the literature review, and the population from which the sample was drawn is delineated. The statistical analysis of data is described in narrative form in the section entitled Findings. Conclusions are based on the research questions found in Chapter 1, and will be offered in the same order as the research questions. A review of relevant research will take place including references to support a research narrative including an analysis and evaluation of findings from research literature.

The Implications section includes feasible recommendations for addressing matters that have been mentioned in the research, and the manner in which the research may be conducted. Future Research describes deficits in the area of research studied, how it should be deliberated, why it is important. A summary begins with a brief statement of purpose, an indication of the findings, and conclusions.

Summary of the Study

The researcher determined that there was a problem with student writing skills that existed in the United States. The ability to write is vital in many academic areas, according to the U. S. Department of Education (2011). As exemplified in the NAEP assessment of 1998, 2007, and 2011, a majority of 70% of student writing scores

remained at the *Basic* level or below, despite efforts on the part of the U.S. Department of Education to conduct teacher and student writing improvement strategies nationwide (U. S. Department of Education, 1999; U. S. Department of Education, 2002; U. S. Department of Education, 2011). All domains of academic study require deep cognitive thought processes, including mathematics science, history, and social studies (Eckhoff & Urbach, 2008). If the writing skills of students of varied intelligence, cognitive function, and exceptionality can be improved through the administration of the lesson plans presented in this study, the research may benefit writing endeavor in all academic spheres.

An examination of research was conducted in order to understand concepts that related to several aspects of the writing process. The researcher examined a continuum of writing process ideas: (a) early childhood writing, (b) effects of rubrics, (c) life experience and symbolism, (d) graphic organizers, (e) non-fiction domains and the making of meaning, and (f) exceptional students.

The purpose of the study was to conduct research using a writing strategy compendium intervention designed to increase cognitive ability for the participants. The scripted writing lessons included brainstorming, autobiographical recall, illustrative art, graphic organizers, peer and teacher feedback, and self-assessment. The compendium can serve as a tool for teachers to increase cognitive function during language arts venues and extend to all other subject areas.

Research Question 1: Did a writing strategy compendium improve learned cognitive function of students identified as exceptional and non-exceptional?

Research Question 2: Did the administration of a writing strategy compendium significantly increase the learned cognitive function of students among the following variables?

- d. Age
- e. Exceptionality/twice exceptionality
- f. Non-exceptionality

The population from which the sample was drawn is the following: the entire sixth grade language arts classes of a public school in Mississippi was given the *Cognitive functions Test TM (CogAT®) Form 7 assessments* and the writing strategy compendium lessons. Once assessment and lessons were completed, the researcher determined the number of gifted students available in addition to those from the sixth grade public school, age ranges from 5 to 13. That number was matched by random selection to approximate the number of non-exceptional students to the number of students who had been identified as exceptional of all ages. Because of experimental mortality of differential loss of subjects and an additional of new subjects, the majority of participants were age 11, with remaining participants ranging in age from 5 to 13.

Limitations

The original intention of the researcher was to analyze the results of the study using the independent variables of the disabilities of ADHD and Autism that were found between both the exceptional and non-exceptional participants. Because of experimental mortality of differential loss of subjects rate, there remained too few participants with the disabilities of ADHD and Autism to obtain sufficient statistical power to use the independent variables of the disabilities of ADHD and Autism, and an analysis of covariance to discover the effect of the variables on the *Cognitive functions Test TM*

(*CogAT® Form 7*) post-assessment and delayed post-assessment of the participants was not conducted. Several participants, both exceptional and non-exceptional, were eliminated because they had missed at least one assessment.

Because of experimental mortality of differential loss of subjects and an additional of new subjects, the majority of participants age eleven, there was not a sufficient number of participants to obtain the power necessary to conduct a mixed measures ANOVA with the variable of age.

A language arts writing intervention compendium was delivered to students identified as exceptional and non-exceptional. All students attended the public school systems of Mississippi. Eighteen of the students were identified as exceptional, and their ages varied from 5 years old to 13 years old. Among the exceptional students were 5 students who had been diagnosed with Attention Deficit Hyperactive Disorder (ADHD) and 1 student who had been identified with Autism Spectrum Disorder (ASD). Among the 19 students who were non-exceptional, 4 were identified with ADHD and 1 with ASD. The researcher originally intended to use the ADHD and ASD diagnoses as independent variables in the repeated measures ANOVA. However, because of dropout rates among the participants due to the time it spent to obtain an IRB and the fact that the IRB liaison determined that it would be best for the researcher, a licensed teacher in the state of Mississippi, not to deliver the assessment and writing strategy compendium lesson to any participants.

As a result, the parents and children (who ranged in age from 10 to 17) who were willing to be participants in the study no longer had a licensed teacher to deliver the 3 assessments and 3 writing strategy compendium lessons. Remaining participants

included 2 teachers at The University of Southern Mississippi who were willing to deliver the assessments and lessons to some of the exceptional and non-exceptional participants, most of whom were children or relatives. There was a large obligation of time and commitment on the part of participants and teachers alike to deliver and participate in the components of the study, and 5-15 potential subjects, most of whom were identified as exceptional, were lost. These 5-15 students could have easily been matched by random selection from the remainder of students in the sixth grade language arts class.

The overwhelming majority of the participants attended a public school in a school district in Mississippi and were eleven or twelve years old. The initial strategy with the participants aged 11-12 was to have a Language Arts teacher, a licensed public school teacher in Mississippi, assess and conduct the writing strategy compendium in a language arts class, the one which contained the most gifted students, with the permission of the school principal. Once the principal heard details about the assessment of cognitive function and the writing strategy compendium, the principal asked the public school language arts teacher to deliver to the researcher a request to include the entire sixth grade of the school in the study. The researcher readily agreed.

Since the researcher believed the study might benefit the cognitive function of all students, a larger participant population was deemed advantageous to the students themselves. Secondly, with a larger participant pool, the chances of achieving a number of participants to create a credible statistical power in order to conduct an effective study were increased.

The entire sixth grade language arts classes of the public school were given the *Cognitive functions Test TM (CogAT®) Form 7 assessments* and the writing strategy compendium lessons. Once assessment and lessons were completed, the researcher determined the number of gifted students available from all ages that were available in the body of participants included in the study, and matched that number by random selection to approximately match the number of non-exceptional students to the number of students who had been identified as exceptional of all ages. Because of experimental mortality of differential loss of subjects and an additional of new subjects, the majority of participants were age 11 and 12, with remaining participants ranging in age from 5 to 13.

Findings

Results of a within-subjects two-way repeated measures ANOVA excluding the variable of age showed that scores were consistently higher on post-assessment grades as compared to pre-assessment grades for both exceptional and non-exceptional. As assessment scores go from pre to post, assessment scores increase. There is a statistically significant difference between pre-assessment to post-assessment to delayed post-assessment.

Descriptive information about the participants in the study included and the results of the within-subjects two-way repeated measures ANOVA and analysis of covariance analyses of data. Results were reported by breaking out the variance into two parts, required for a repeated measures ANOVA; variance was explained by groups and variance were explained by differences among individuals over time. An analysis of covariance, or ANCOVA, was conducted to adjust for the three teachers of three separate groups in 3 settings who administered the *Cognitive functions Test TM (CogAT®) Form*

7 assessment pre-intervention, the writing strategy compendium presented in a series of three lessons, the post assessment of *Cognitive functions Test TM (CogAT®) Form 7 assessment*, and the delayed post assessment of the *Cognitive functions Test TM (CogAT®) Form 7 assessment*.

A statistically significant difference was found between the learned cognitive function of exceptional/twice-exceptional and non-exceptional students pre-assessment, post assessment, and delayed assessment of *Cognitive functions Test TM (CogAT®) Form 7 assessment*. Results of the study revealed that the administration of a scripted three-lesson writing intervention compendium made a significant difference in the learned cognitive function of both exceptional and non-exceptional students from the pre-intervention to post-intervention.

All participants completed the entire protocol, including pre-intervention cognitive assessment by *Cognitive functions Test TM (CogAT®) Form 7 assessment*, three writing strategy compendium lessons including autobiography and illustration, post-intervention assessment by *Cognitive functions Test TM (CogAT®) Form 7 assessment*, and delayed post-intervention assessment by *Cognitive functions Test TM (CogAT®) Form 7 assessment*.

An assessment measure of cognitive function was delivered to the participants pre-intervention, post-intervention, and delayed post-intervention to determine whether there was a statistically significant difference between the scores of exceptional and non-exceptional students. A statistically significant difference was found between the learned cognitive function of exceptional/twice-exceptional and non-exceptional students pre-

assessment, post assessment, and delayed assessment of *Cognitive functions Test TM (CogAT®) Form 7 assessment*.

The dependent measure in Hypothesis 1 is pre-assessment, post-assessment, and delayed post-assessment. Our independent or between subjects variables are exceptional and non-exceptional students with exceptional students coded as 1 and non-exceptional students coded as 0. Results of the between-subjects two-way repeated measures ANOVA and covariance analyses of data revealed that there is a significant difference between the scores of exceptional and non-exceptional students. When a covariance was conducted to determine the effect of teachers on the scores of the three groups of students, it was found that the effect of teachers/settings was not significant. There was an effect nearing significance, but was not significant.

There was a statistically significant difference between the learned cognitive function of students of exceptional and non-exceptional abilities and varying ages after the administration of a writing strategies compendium. There was no significant interaction between the pre- and post-assessments with *Cognitive functions Test TM (CogAT®) Form 7*.

There was a significant difference between the pre- and post assessments with *Cognitive functions Test TM (CogAT®) Form 7 assessment* for both exceptional and non-exceptional students. There was a significant increase in scores from pre-assessment to post-assessment, but the increase from pre-assessment to delayed post-assessment was not found to be significant and post-assessment to delayed post-assessment was not found to have statistical significance. Student scores did not significantly decline at the post-assessment.

Both groups significantly increased from pre-assessment to post-assessment. There is not a statistically significant increase from pre-assessment to delayed post-assessment. There is not a statistically significant increase from post-assessment to delayed-post assessment. Once assessment scores rise, scores do not significantly decline. There is no interaction between exceptional and non-exceptional statistics.

Pre-assessment, post-assessment, and delayed post-assessments acted the same for both groups of participants. The writing treatment did not work better for the exceptional students than for non-exceptional students. Indeed, scores after post-assessment continued to rise to the delayed post-assessment conducted with the *Cognitive functions Test TM (CogAT®) Form 7 assessment*.

There was a significant main effect of the *Cognitive functions Test TM (CogAT®) Form 7* on cognitive function. Results of the study revealed that the administration of a scripted three-lesson writing strategy compendium made a statistically significant difference in the learned cognitive function of both exceptional and non-exceptional students from the pre-intervention to post-intervention. Non-exceptional students showed a continued increase in cognitive function after the post-intervention assessment and before the delayed post-intervention assessment took place. Exceptional students showed a slight overall improvement in cognitive function from the pre-assessment to the delayed post-assessment (Lohman, 2012).

The original intention of the researcher was to analyze the results of the study using the independent variables of the disabilities of ADHD and Autism that were found between both the exceptional and non-exceptional participants. Because of experimental mortality of differential loss of subjects rate, there remained too few participants with the

disabilities of ADHD and Autism to obtain sufficient statistical power to use the independent variables of the disabilities of ADHD and Autism, and an analysis of covariance to discover the effect of the variables on the *Cognitive functions Test TM (CogAT®) Form 7* post-assessment and delayed post-assessment of the participants was not conducted. Several participants, both exceptional and non-exceptional, were eliminated because they had missed at least one assessment.

Because of experimental mortality of differential loss of subjects and an addition of new subjects, the majority of participants who were aged 11 and 12, there was not a sufficient number of participants to obtain the power necessary to conduct a mixed measures ANOVA with the variable of age. Results of a within-subjects two-way repeated measures ANOVA excluding the variable of age showed that scores were consistently higher on post-assessment grades as compared to pre-assessment grades for both exceptional and non-exceptional. As assessment scores go from pre to post, assessment scores increase. There is a statistically significant difference between pre-assessment to post-assessment to delayed post-assessment.

Conclusions

Two research questions and two hypotheses explored the efficacy of a writing strategy compendium in improving verbal, non-verbal, and quantitative cognitive, or reasoning, function in exceptional and non-exceptional students.

Research Question 1: Did a writing strategy compendium improve learned cognitive function of students identified as exceptional and non-exceptional?

H₁: There was a significant difference between the learned cognitive function of exceptional/twice-exceptional and non-exceptional students pre-assessment, post

assessment, and delayed assessment by *Cognitive functions Test TM (CogAT®) Form 7 assessment* of cognitive functions.

Research Question 2: Did the administration of a writing strategy compendium significantly increase the learned cognitive function of students among the following variables?

- g. Age
- h. Exceptionality/twice exceptionality
- i. Non-exceptionality

H₂: To what degree did the administration of a writing strategy compendium alter the learned cognitive function of students according to the following variables:

- Age
- Exceptionality/twice exceptionality
- Non-exceptionality

Studies conducted by Davis (2003) revealed that autobiographical recall was shown to be an effective strategy in drawing out students' emotions and interests.

Research uncovered numerous studies involving strategies of autobiographical investigation in order to stimulate thought and creativity (Boals, 2012; Davis, 2003; Read, 2010).

The researcher found it interesting to note that none of the academic articles inspected included mention of student creation of art to bring up emotion and autobiographical memory, though it seems a logical conclusion to do so by the researcher. However, the autobiographical recall proved to be an effective strategy for

bringing out and engaging student interest in the present study. An anecdotal note of interest was the following: several parents of some of the exceptional students remarked to the researcher that their children had developed an interest in writing, and continued to create booklets with writing along with art illustrations.

Furthermore revealed in research were language arts interventions combining storybook illustrations and the viewing of fine art in galleries (Eckhoff & Urbach, 2008; O'Donnell, 2002). In addition, there were no studies revealed that used students' own art works to deepen and intensify cognitive function toward the production of narrative and expository literature.

While meaningful research has been conducted in the area of enhancement of cognitive (reasoning) functions through writing strategies, little information was found by the researcher about the development of cognitive function through writing interventions among those students who are exceptional.

Colangelo and colleagues (1987) conducted research about the importance of developing cognition among all students, including students who are exceptional with or without disabilities. The researchers concluded that the education of exceptional individuals is neglected in areas of cognitive and writing development, a valuable opportunity develop the educational prospects of all exceptional students will be lost. Exceptional students are a valuable resource. Leadership, creativity, discoveries, and the general elevation of the joy of learning are factors that exceptional students bring to all domains of education. Exceptional students represent a challenge to educators, according to Colangelo et al. (Colangelo et al., 1987).

During the present study, non-exceptional student scores increased after the administration of the writing strategy compendium, and continued to increase slightly by the delayed post assessment of cognitive function. However, the scores of exceptional students increased at a greater angle than did the scores of non-exceptional students, but decreased at the delayed post-assessment to a point not far from the pre-assessment, a contrast with the behavior of non-exceptional students. Colangelo et al. (1987) was correct in the conclusion that exceptional students present a challenge to educators. Were students bored by repeatedly taking the same assessments? Were the assessments much less of a challenge to them to begin with?

Once the researcher discovered that non-exceptional student scores increased post-assessment to delayed post-assessment, the researcher began to examine prior research to try to determine the reason. Studies by Marsh and Hua in 2003 investigated self-concept for students who are enrolled in curricula designed for students identified as exceptional. Mean scores of academic self-concept dropped during the attendance at schools especially for exceptional students. Gifted students possibly felt a pressure to perform on the writing lessons as well as the assessments. Since five of the students identified as exceptional were diagnosed with learning disabilities, perhaps the work of Besnoy (2009) could partially explain the recession of scores among the exceptional students. Besnoy (2009) determined that gifted students with learning disabilities have difficulty expressing and internalizing information; these complexities tend to endure over long periods of time. High levels of intellectual gifts make students more aware of their own learning disabilities.

During the time when the researcher was searching for strategies to engage the attention of a sixth grade language arts class, the researcher noted that students were constantly doodling drawings on their writing pages. When questioned, the students often mentioned that the doodles reminded them of things thought of while writing. A few students even said that the doodles helped them remember what they wanted to write about. The observation, a key one to developing the writing strategy compendium, was borne out by a study conducted by Stagey and Ross (1975) about student drawing that involved Piaget's theories about the development of schemata. The researcher developed a method of using original art illustrations along with autobiographical recall because of the few areas of interest to students was writing about their own lives. When the researcher added autobiographical recall to the writing, students immediately became interested in the lessons. As the year progressed, students seemed to look forward to the class and students would frequently inquire upon entering the class about the subject matter of the class on the current day. Because student interest and MCT₂ scores appeared to increase, the researcher continued developing a writing strategy compendium. The compendium that was developed is the same format that was implemented in the present research.

Stagey and Ross concluded that there were three essential processes composing the development of schemata required accretion, fine-tuning, and reconstruction. Accretion allows firsthand information to be recalled based on prior knowledge without any changes taking place. Tuning has an impact more directly on recollection as data causes an alteration. Reconstruction happens when new material cannot be incorporated into current memory in any other way (Stagey & Ross, 1975). Stagey and Ross (1975)

determined that student drawings could be used during the writing process as a quick reference to remember memory material that could later be accessed to use for narrative writing. The results of the present study bear out the research of Stagey and Ross.

Since research was conducted in by Stagey and Ross as early as 1975, it appeared to the researcher the material was readily available as a resource for writing teachers, it appeared reasonable to the researcher that art could have been previously used in conjunction with writing strategies, but no evidence of this use was found.

Richardson (1985) concluded that Vygotsky's theory of cognitive learning centers on teaching that provides scaffolding, a supportive process that happens when a teacher becomes more of a facilitator by incremental stages and control of learning is handed over to the student. The research of Richardson was borne out by the result of the present study, because the study involved scaffolding the student through stages and strategies of writing to finally become an autonomous and effective writer. Jackson and Moyle concluded that results of scaffolding include increases in task proficiency, content that is as accurate as possible, and students' involvement in the learning process will be on varied levels to provide further support one another (Jackson & Moyle, 2009).

According to research conduct by Yilmaz (2011). Sensory channels connect the new information to a database of prior knowledge and into short-term memory. Significant information is kept in long-term memory and is able to be remembered later. In order to be efficacious, the teacher must take the focus off the context of the material and direct the emphasis to the context and proficiencies of the student. Students who have the ability to connect previous material to newly acquired concepts are more likely to recollect prior knowledge. (Yilmaz, 2011). The present study determined the learning

ability, or reasoning process measurement, of participants pre-intervention, post intervention, and delayed post intervention using the *CogAT® Form 7 assessment*.

Fartoukh and colleagues (2012) analyzed the way emotion affected complex cognitive processes by using short-term autobiographical narrative writing. Student work contained a significant number of text words when a vocabulary of positive and negative emotions was utilized by teachers in short-term writing strategies. The present study using a writing strategies compendium using autobiography and illustrative art yielded statistical results that very much bears out the research of Fartoukh et al. in a representative sense, since Fartoukh et al. (2012) measured significant text words and the present study measured cognitive function. Perhaps most accurately paralleled by the present study was the research of Hillocks (1987), who concluded that cognitive development occurs when students interact with the environment, including stimulus of art and rich experience (Hillocks, 1987).

Techniques investigated in the review of literature were strategies that included brainstorming, visual art, storybooks, symbolism, peer and teacher feedback, journaling, and graphic organizers (Kong & Hoare, 2011; Lee & Tan, 2010; Marteski, 1998; Read, 2010; Villa & Calvo, 2011; Wilson, 2007) to stimulate student imagination. The present study proved the efficacy of a combination of such tools that were developed by teachers and researcher for many years.

Implications

By determining student abilities in verbal, visual and numerical areas of cognition, educators could improve strategies of developing student comprehension in the areas of math, science, and humanities. During the four years the researcher taught

language arts classes at a public school in Mississippi, the teacher also observed young and recently certified science and reading teachers use drawings as memory prompters. Teachers might use memory art as a point of departure to teach informational text writing. There are several implications for practice in the classroom that have been discovered during the present study. It appears that language arts teachers and teachers involved in science and other subjects that require an investigation of non-fiction subjects might well implement illustrations as a part of teaching. The researcher has observed that, despite suggestions that art be a part of teaching, teachers who are not trained in art are often hesitant to implement art in classrooms. Perhaps teachers feel that it is not within their bailiwick to pursue art as part of classroom activities, or are not confident to do so. However, the researcher has observed that students are quick to respond to any suggest of visual activity. It need not be led by an expert in illustration or art history, and needs only to be suggested by a teacher who wishes to allow students a free rein into imagination, the area of the mind that drives and inspires all of humanity.

Fartoukh et al. (2012) theorized that writing about an autobiographical event with emotional content would be more convincing and subjective than writing on topics of neutral interest to participants. An analysis of variance showed a significantly greater number of text words when an emotional vocabulary of positive and negative was utilized than in the neutral condition. Fartoukh et al. (2012) concluded that there may be precise connections between emotion and certain properties of writing and that autobiographical recall is a good method to induce emotional involvement. Further investigation into effects of emotion in the study of writing might increase students' cognitive writing development.

In Davis' study during 2003, students conducted interviews in order to engage in thinking about an autobiography. Students brainstormed about methods of interviewing that might be conducted. Meaningful results occurred; social and cultural issues were closely examined. Students constructed writing based on meaning and significance in the lives of families and other students. Groups collaborated to share experiences in art, poetry, and narrative. During the conduction of research involving multiple sources of data, strong evidence was revealed that students' multiple intelligences were stimulated and focused on creative and expository writing, cognitive thought was stimulated, and writing abilities were greatly enhanced (Davis, 2003).

Interviews of family members could be used as a Language Arts strategy. Once an interesting experience or vocation was determined, such as an uncle who was a pilot in the Vietnam War, or a grandmother who was a former gymnast, the informational text could be developed with the information in mind including researched illustration. The process would not require more than pencil, paper, crayons, a few language arts lessons about how to conduct an interview, and some encyclopedias. Even old ones would definitely work.

Future Research

There was a significant main effect of the *Cognitive functions Test TM (CogAT®) Form 7* on cognitive function, and non-exceptional students showed a continued increase in cognitive function after the post-intervention assessment and before the delayed post-intervention assessment took place. The students' cognitive function continued to increase during the delayed post-assessment at the end of the study. Investigation into the possible reasons that exceptional scores significantly decreased at the delayed post-

assessment and Non-exceptional student scores continued to increase could be grounds for important research.

A study was conducted by Preckel, Holling, and Wiese (2005) about the relationship between intelligence and creativity among gifted and non-gifted students aged 12-16. The threshold theory of the study was that non-gifted students had a greater connection between intelligence quotient and creativity than did gifted students, in this case those with an Intelligence Quotient of 120 and above. It was found that partial correlations between intelligence and creativity existed for verbal ability. Correlations with numerical ability were unconvincing, leaving rich ground for future research.

Further investigation into effects of emotion in the study of writing might increase the cognitive function of students as it relates to writing development. Yilmaz (2011) concluded that the active participation of students in the development of their own cognitive processes is a vital part of developing human memory banks over time. Yilmaz scholarly studies about the pioneering cognitive theories of Jean Piaget concluded that the cognitive process includes sequential steps wherein new information becomes a part of memory-stored data. Individuals often altered their present memory or reorganized stored information in order to return to an equalized state of the memory bank.

The present study involved searching memory of actual events to discover a rich bank of textual material by the use of illustration and brainstorming to delve into memory banks. Based on studies by Yilmaz (2011). The researcher observed that memories that have been corrected because of traumatic events might be brought into present consciousness and recreated in a more truthful light. The gentle method of bringing up memories through peer sharing, teacher sharing, and self-evaluation described in the writing

strategies compendium might enrich and recreate memories in a more positive light. Memories might then be used to more accurately and faithfully represent the student's experience, unleashing unprecedented creativity in an art and writing coalition.

Many public and private schools in the United States use the *Cognitive functions Test TM (CogAT®) Form 7* assessment developed by David Lohman of the University of Iowa concluded that teachers should focus on student scores on the three *Cognitive functions Test TM (CogAT®) Form 7 assessment* batteries for purposes of determining instruction design and domain emphasis for the optimal academic and cognitive functioning of the individual student. The Ability Profile identifies a pattern of scores to determine whether some scores are significantly higher or lower than others. The same pattern often has different connotations for instruction if the level assessment is low rather than high (Lohman, 2012). After an extensive search into academic material, the researcher found no articles that used the *Cognitive functions Test TM (CogAT®) Form 7 assessment* to identify specific talents in unforeseen areas of student cognitive function, especially those with disabilities, both exceptional and non-exceptional.

During the gathering of data, the researcher came upon a near-perfect score on all 9 of the tests and subtests involved in the testing of the CogAT7. The student had not been identified as gifted. Since the student was at the ceiling of most tests, there was no chance to really show the full range of cognitive skills. The *Cognitive functions Test TM (CogAT®) Form 7 assessment* has a method to raise the ceiling for exceptional students, but the researcher found no one in the field of academic research who was using the CogAT 7 to investigate the possibilities of highly gifted or twice-exceptional students.

An additional student, identified as non-exceptional with ADHD, was recently diagnosed with the additional disability of dyslexia. The scores improved from pre- to post- to delayed post-assessment. The student finished every single question, and even made a near-perfect score on the quantitative subtest that was a consistent low score for both exceptional and non-exceptional students. What hidden abilities of the young person might be developed, given the chance? In addition, hidden areas of difficulty might be revealed in other areas that could require remediation.

The researcher recommends in-depth scholarly use of the CogAT7 for both a humanistic role and a benefit to the entire educational community. Who knows what talent is not being used for the scholastic gain of the student, including the students' own self-esteem, and of society-at-large?

Summary

The purpose of the study was to examine whether the administration of a scripted three-lesson writing intervention compendium that includes autobiographical recall and art can make a significant difference in the learned cognitive function of exceptional and non-exceptional students. The results of the study can help educators understand the necessity for alternative measures of cognitive development for both exceptional and non-exceptional students as well as all students who may require remediation.

Cognitive function areas to be measured included verbal abilities, non-verbal and quantitative learned cognitive function of students. The experimental procedure involved students identified as exceptional and non-exceptional who were enrolled in public school systems of Mississippi. Students participated in a total of 3 writing lessons for

about 45 minutes. The instruction involved brainstorming and illustration to create a rough draft of a narrative that was then used to produce a published paper.

By conducting this study, it was the hope of the researcher that other academics will be better able to continue valuable research that connects abstract reasoning skills to concrete results designed for developing cognitive functions in writing. This information could help educators understand the necessity for creating alternative measures of cognitive development for students identified as exceptional as well as all students who may require remediation in certain areas. By determining student abilities in verbal, visual, and numerical areas of cognition, educators could improve strategies of developing student knowledge in the areas of math, science, and humanities.

There was a statistically significant difference between the learned cognitive function of students of exceptional and non-exceptional abilities and varying ages after the administration of a writing strategies compendium. There was no significant interaction between the pre- and post-assessments with *Cognitive functions Test TM (CogAT®) Form 7*.

There was a significant difference between the pre- and post-assessments with *Cognitive functions Test TM (CogAT®) Form 7 assessment* for both exceptional and non-exceptional students. There was a significant increase in scores from pre-assessment to post-assessment, but the increase from pre-assessment to delayed post-assessment was not found to be significant and post-assessment to delayed post-assessment was not found to have statistical significance. Student scores did not significantly decline at the post-assessment.

Both groups significantly increased from pre-assessment to post-assessment. There is not a statistically significant increase from pre-assessment to delayed post-assessment. There is not a statistically significant increase from post-assessment to delayed post-assessment. Once assessment scores rise, scores do not significantly decline. There is no interaction between exceptional and non-exceptional statistics. Pre-post-, and delayed post-assessments acted the same for both groups of participants. The writing treatment did not work better for the exceptional students than for non-exceptional students. Indeed, scores after post-assessment continued to rise to the delayed post-assessment conducted with the *Cognitive functions Test TM (CogAT®) Form 7 assessment*.

There was a significant main effect of the *Cognitive functions Test TM (CogAT®) Form 7* on cognitive function. Results of the study revealed that the administration of a scripted three-lesson writing strategy compendium made a statistically significant difference in the learned cognitive function of both exceptional and non-exceptional students from the pre-intervention to post-intervention. Non-exceptional students showed a continued increase in cognitive function after the post-intervention assessment and before the delayed post-intervention assessment took place. Exceptional students showed a slight overall improvement in cognitive function from the pre-assessment to the delayed post-assessment (Lohman, 2012). The students' cognitive function had continued to increase by the end of the study.

Outcomes of the most recent National Assessment of Educational Progress (NAEP) assessment in writing showed that roughly 70% of the representative sampling of students in grades 8 and 12 scored only at the *Basic* (fractional grasp of prerequisite

information and abilities) level and below (National Center for Education Statistics, 2012). Fifty-four percent of students in the eighth grade and 52% of students in the twelfth grade in the United States scored at the *Basic* level. Another 20% of students in the eighth grade and 21% of students in the twelfth scored *below* the *Basic* level. The two remaining levels in the assessment were *Proficient* (competency, subject-matter knowledge, application, and analytic skills) and *Advanced* (superior performance) (U. S. Department of Education, 2011). Only one quarter of students in the eighth grade and students in the twelfth grade achieved at the *Proficient* level in writing. The highest possible score of the writing assessment, *Advanced* (superior performance) was achieved by only 3% of both 8th and 12th graders (Kuczynski-Brown, 2012).

According to the U.S. Department of Education in 2011, writing in the 21st century is described by its frequency and its effectiveness. The ability to write is vital in many academic areas. Writing is crucial for a dynamic and engaged citizenry (U.S. Department of Education, 2011). Clearly there is room in the writing curriculum of public and private schools for innovative, engaging writing strategies that would improve the content and thought processes behind the writing.

In conclusion, the need for effective new writing strategies is great. It is the hope of the researcher that the present study will enable researchers to connect abstract reasoning skills to concrete results with the goal of developing increased cognitive function in writing. This information could help educators understand and develop creative alternative measures of writing development for students identified as exceptional as well as all students who may require remediation in certain areas. By determining student abilities in verbal, visual, and numerical areas of cognition, educators

could improve strategies of developing student comprehension in the areas of math, science, and humanities. If the writing skills of students of varied intelligence, cognitive function, and exceptionality were improved through the administration of the lesson plans presented in this study, the research may benefit writing endeavors in all areas.

APPENDIX A

IRB APPROVAL LETTER

**INSTITUTIONAL REVIEW BOARD**

118 College Drive #5147 | Hattiesburg, MS 39406-0001

Phone: 601.266.5997 | Fax: 601.266.4377 | www.usm.edu/research/institutional.review.board

NOTICE OF COMMITTEE ACTION

The project has been reviewed by The University of Southern Mississippi Institutional Review Board in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services (45 CFR Part 46), and university guidelines to ensure adherence to the following criteria:

- The risks to subjects are minimized.
- The risks to subjects are reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered regarding risks to subjects must be reported immediately, but not later than 10 days following the event. This should be reported to the IRB Office via the "Adverse Effect Report Form".
- If approved, the maximum period of approval is limited to twelve months. Projects that exceed this period must submit an application for renewal or continuation.

PROTOCOL NUMBER: 14101708

PROJECT TITLE: Cognitive Function and the Administrations of a Writing Strategy

PROJECT TYPE: New Project

RESEARCHER(S): Jonnie Cleveland

COLLEGE/DIVISION: College of Education and Psychology

DEPARTMENT: Curriculum, Instruction and Special Education

FUNDING AGENCY/SPONSOR: N/A

IRB COMMITTEE ACTION: Exempt Review Approval

PERIOD OF APPROVAL: 11/7/2014 to 11/06/2015

Lawrence A. Hosman, Ph.D.

Institutional Review Board

APPENDIX B

**The University of Southern Mississippi Institutional Review Board
Informed Consent Form for Research Involving Human Subjects**

Protocol Title: *Cognitive Function And The Administration Of A Writing Strategy****Compendium Incorporating Autobiographical Recall And Art*****Principal Investigator: Jonnie Cleveland****USM Department of Curriculum, Instruction, and Special Education:**

1. Introduction

Your child is being asked to take part voluntarily in the research project described below. Before agreeing to take part in this research study, it is important that you read the consent form that describes the study. Please ask the study researcher or the study staff to explain any words or information that you do not clearly understand.

2. Why is this study being done?

Your child has been asked to take part in a study entitled *Cognitive Function And The Administration Of A Writing Strategy Compendium Incorporating Autobiographical Recall and Art*. Approximately 16-28 exceptional and normal students will be enrolling in this study.

- You are being asked to be in the study because you are a parent of a child who is part of this research.
 - The test is designed to determine each student's level of cognitive ability before, after and at a maintenance phase a month or so after the administration of a 3-part lesson that implements writing strategies incorporating autobiographical recall and art.
-

3. What is involved in the study?

- The *Cognitive functions Test TM (CogAT®) Form 7 assessment* instrument of measurement will be used to ascertain cognitive function before the writing strategy compendium, immediately afterward, and 3 weeks to 1 month later to determine maintenance of function. These scores will be correlated with materials available to teachers, parents, and administrators to help adjust instructional strategies and resources to the individual needs of the student. Each assessment takes about 1 hour. Each of the 3 writing interventions takes about 1 hour.

4. What are the risks and discomforts of the study?

| There are no known risks associated with this research.

5. What will happen if I am injured in this study?

- Description: The University of Southern Mississippi and its affiliates do not offer to pay for or cover the cost of medical treatment for research related illness or injury. No funds have been set aside to pay or reimburse you in the event of such injury or illness. You will not give up any of your legal rights by signing this consent form. You should report any such injury to Jonnie Cleveland at 662-582-7445 and to the Chair of the Institutional Review Board, The University of Southern Mississippi, 118 College Drive #5147, Hattiesburg, MS 39406-0001, at 601-288-6821, and irb.@usm.edu.

6. Are there benefits to taking part in this study?

- By conducting this study, researchers will be able to potentially understand whether there is an increase of learned cognitive function after the administration of the three lessons of autobiographical writing that include art. Releasing memories that may have had profound effects on the child's psychology, improved social skills and emotional responses may be facilitated.
- This information may be valuable to educators in helping them understand what is essential for the experience to be described by the students as being a valuable and creative writing experience. This study will be submitted for publication to add to the literature base regarding writing skills instruction and cognitive function, and could be presented in the future at conferences.

7. What other options are there?

- You have the option not to take part in this study. There will be no penalties involved if you choose not to take part in this study.

8. What if I want to withdraw, or I am asked to withdraw from this study?

- Taking part in this study is voluntary. You and your child have the right to choose not to take part in this study. If you or your child does not take part in the study, there will be no penalty. If you and your child choose to take part, you both have the right to stop at any time. The researcher may decide to stop your participation without your permission, if he or she thinks that being in the study may cause the child harm.

9. Who do I call if I have questions or problems?

- You may ask any questions you have now. If you have questions later, you may call Jonnie Cleveland at 662-582-7445 or contact jonnie.cleveland@eagles.usm.edu.
- If you have questions or concerns about your participation as a research subject, please contact the Chair of the Institutional Review Board, The University of Southern Mississippi, 118 College Drive #5147, Hattiesburg, MS 39406-0001 or the Institutional Review Board (IRB) at 601-288-6821, or at irb.usm.edu.

10. What about confidentiality?

- Your part in this study is confidential. None of the information will identify you by name.
- Every effort will be made to keep your information confidential. Your personal information may be disclosed if required by law. Organizations that may inspect and/or copy your research records for quality assurance and data analysis include, but are not necessarily limited to the USM Institutional Review Board.
- The results of this research study may be presented at meetings or in publications; your identity will not be disclosed in those presentations.
- The written report showing the results of this study will not identify any school or student by name. No identifying information will be collected by the researchers. To insure confidentiality, the researchers will assign non-descriptive letters to each of the student data files obtained in this study. Collected information will remain in the possession of the researchers or locked in a secure cabinet until destroyed by shredding.

11. Mandatory reporting

If information is revealed about child abuse or neglect, or potentially dangerous future behavior to others, the law requires that this information be reported to the proper authorities.

12. Authorization Statement

I have read each page of this paper about the study (or it was read to me). I know that being in this study is voluntary and I choose to be in this study. I know I can stop being in this study without penalty. I will get a copy of this consent form now and can get information on results of the study later if I wish.

Parent/Guardian Signature: _____

Consent form explained/witnessed by: _____

Printed name of Parent/Guardian: _____ Signature

Date: _____ Time: _____

Child Assent Form

My name is Miss Jonnie Cleveland. I am trying to learn about what happens when students write about important things that have happened during their lives. If you would like to be in my study, you will be able to learn about writing an autobiography, which is a story of your own life.

Other people will not know if you are in my study. I will put things I learn about you together with things I learn about other children, so no one can tell what things came from you. When I tell other people about my research, I will not use your name, so no one can tell to whom I am talking.

Your parents or guardian have to say it is all right for you to be in the study. After they decide about the study, you will be able to choose if you want to be in the study also. If you don't want to be in the study, your grades will not be affected. If you want to be in the study now and change your mind later, it is fine with everyone. You can stop at any time.

My telephone number is 662-582-7445. You can call me if you have questions about the study or if you decide you do not want to be in the study any more.

I will give you a copy of this form in case you want to ask questions later.

Agreement

I have decided to be in the study even though I know that I do not have to do it. Miss Jonnie Cleveland has answered all my questions.

Signature of Study Participant

Signature of Researcher

THE UNIVERSITY OF SOUTHERN MISSISSIPPI

AUTHORIZATION TO PARTICIPATE IN RESEARCH PROJECT

Participant's Name _____

Consent is hereby given by parent/guardian(s) to participate in the research project entitled *Cognitive Function And The Administration Of A Writing Strategy Compendium Incorporating Autobiographical Recall And Art*. All procedures and/or investigations to be followed and their purpose, including any experimental procedures, were explained by _____ . Information was given about all benefits, risks, inconveniences, or discomforts that might be expected.

The opportunity to ask questions regarding the research and procedures was given. Participation in the project is completely voluntary, and participants may withdraw at any time without penalty, prejudice, or loss of benefits. All personal information is strictly confidential, and no names will be disclosed. Any new information that develops during the project will be provided if that information may affect the willingness to continue participation in the project.

Questions concerning the research, at any time during or after the project, should be directed to Jonnie Cleveland, 113 N. 33rd St., Hattiesburg, MS, 39402, phone 662-582-7445. This project and this consent form have been reviewed by the Human Subjects Protection Review Committee, which ensures that research projects involving human subjects follow federal regulations. Any questions or concerns about rights as a research participant should be directed to the Chair of the Institutional Review Board, The University of Southern Mississippi, 118 College Drive #5147, Hattiesburg, MS 39406-0001, 601-288-6821, or at irb.usm.edu.

The University of Southern Mississippi has no mechanism to provide compensation for participants who may incur injuries as a result of participation in research projects. However, efforts will be made to make available the facilities and professional skills at the University. Information regarding treatment or the absence of treatment has been given. In the event of injury in this project, contact the Chair of the Institutional Review Board, The University of Southern Mississippi, 118 College Drive #5147, Hattiesburg, MS 39406-0001, at 601-288-6821 or at irb.usm.edu. A copy of this form will be given to the participant.

Signature of participant's parent/guardian(s)

_____ Date _____

Signature of person explaining the study

_____ Date _____



THE UNIVERSITY OF SOUTHERN MISSISSIPPI

*The Frances A. Karnes
Center for Gifted Studies*

118 College Drive #8207
Hattiesburg, MS 39406-0001
601.266.5236
www.usm.edu

Dear Parent:

We are asking for your help and cooperation in a collaborative research project investigating the effects of a three lesson writing intervention using autobiographical recall and art on the learned cognitive function of exceptional and normal students.

The project involves using writing strategies and visual images, researched materials, and a scripted writing lesson to stimulate thought processes of autobiographical events important to the child. The child will write a narrative about an event of choice within a specific response time of one hour, on 3 different occasions, approximately one week apart. The student will receive a cognitive assessment before, after, and about a month after the cognitive assessment.

Your child's decision to participate in this study is completely voluntary. Your child is not required to participate and declining to participate in no way jeopardizes your child's academic standing. To ensure anonymity, please do not write your name or any identifying information on any portion of the packet. All responses will be completely anonymous; it will not be possible to match your child with your child's data in any way.

In this project, there are no known economic, legal, physical, psychological, or social risks to participants in either immediate or long-range outcomes. I understand that it is not possible to identify all potential risks in an experimental procedure, but I believe that reasonable safeguards have been taken to minimize both the known and the potential, but unknown, risks. If you agree to participate, you may choose not to answer any given questions, and you may withdraw your consent and discontinue your participation at any time.

You will receive an informed consent form when you arrive to participate. If you have any questions about your participation in this research, please ask them before you begin. The purpose of the study will be to measure how learned cognitive function is affected by the administration of a writing strategy compendium to of K-11th grade exceptional and non-exceptional students.

If you have any questions or concerns about the nature of this study, please contact Jonnie Cleveland, Department of Curriculum, Instruction, and Special Education, The

University of Southern Mississippi, Hattiesburg, MS, 662-582-7445. If you have any questions about your treatment as a human subject in this study, you may contact the Chair of the Institutional Review Board, The University of Southern Mississippi, 118 College Drive #5147, Hattiesburg, MS 39406-0001, at 601-288-6821 or at irb.usm.edu. Thank you for considering giving your help in this research.

Sincerely,

Jonnie Cleveland

Oral Presentation of Research Project

Purpose: The purpose of the study is to examine whether the administration of a scripted three-lesson writing intervention compendium that includes autobiographical recall and art can make a significant difference in the learned cognitive function of exceptional and non-exceptional students. Cognitive function areas to be measured include verbal abilities, non-verbal and quantitative learned cognitive function of students.

Description of Study: The experimental procedure involves students identified as exceptional and non-exceptional who are enrolled in public school systems in Mississippi and Florida.

They will be asked to participate in a total of 3 writing lessons for about 45 minutes. The instruction involves brainstorming and illustration to create a rough draft of a narrative that is then used to produce a published paper.

Benefits: The students' writing skills may increase by the end of the study. The methods of memory recall may have a positive benefit on the student's sense of well-being, and emotional response may be facilitated.

Risks: There are no known physical, psychological, social, or financial research related risks or side effects that can be predicted from this study.

Confidentiality: To insure confidentiality, the researchers will assign non-descriptive letters to each of the student data files obtained in this study. Collected information will remain in the possession of the researchers until destroyed by shredding. The written report will not identify any school or student by name. School officials and parents may elect to withdraw a child from the study at any time during the process.

Participant's Assurance: This project has been reviewed by the Human Subjects Protection Review Committee, which ensures that research projects involving human subjects follow federal regulations. Any questions or concerns about rights as a research participant should be directed to the Chair of the Institutional Review Board at 601-288-

6821. Participation in this project is completely voluntary, and participants may withdraw from this study at any time without penalty, prejudice, or loss of benefits. Any questions about the research should be directed to Jonnie Cleveland at 662-582-7445.

Jonnie

Cleveland_____

August 16, 2014

113 North 33rd Avenue, #D11
Hattiesburg, MS 39401

Principal Crosby
Moselle Elementary School
168 Rayner Road
Moselle, MS 39459

Dear Mr. Crosby:

I am a graduate student at The University of Southern Mississippi, pursuing a doctorate in Special Education, with an emphasis in Gifted Studies. I am requesting that one of your teachers, Mrs. Tiffany Sanford, be allowed to present three creative writing lessons and three assessments of cognitive function to students in her classroom. The names of the students will not be a part of the research.

The analyzed data will be used to complete a research report, which will be presented to the teacher in order to let her know the results of the report. By conducting this study, researchers will be able to further understand how writing using autobiographical recall and art can affect the cognitive function of students. All of the information obtained will be kept strictly confidential, with no school, student, or teacher called by name and collected information will remain in a secure cabinet.

I am requesting a letter of approval to conduct research at Moselle Elementary School. This letter may be e-mailed to jonnie.cleveland@eagles.usm.edu or sent as hard copy to Jonnie Cleveland, 113 N. 33rd Avenue, #D11, Hattiesburg, MS 39401. I welcome questions or concerns via e-mail or phone (662-582-7445) and thank you in advance for your consideration and collaboration with The University of Southern Mississippi.

Very truly yours,

Jonnie Cleveland

Jonnie Cleveland

MOSELLE ELEMENTARY SCHOOL

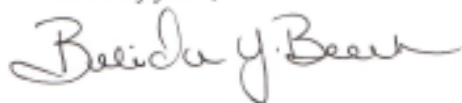
P. O. Box 249
Moselle, MS 39459
(601) 582-7586 Phone
(601) 582-7587 Fax

|
The University of Southern Mississippi
Institutional Review Board
Human Subjects Protection Review Committee
118 College Dr. #5147
Hattiesburg, MS 39406

To Whom It May Concern:

Please accept this letter as evidence of our agreement to participate in the proposed research study at Moselle Elementary School. We agree to cooperate with Miss Jonnie Cleveland in this research endeavor. I understand that the research will include three language arts lessons and three cognitive assessments of students delivered by Mrs. Tiffany Sanford. Student identities will remain completely anonymous. We understand that this research will not commence without Institutional Review Board approval, which will verify that the research will be conducted in an appropriate and ethical manner.

Sincerely yours,



APPENDIX C

Scripted Unit Plan for: *Cognitive Function And The Administration Of A Writing Strategy Compendium Incorporating Autobiographical Recall And Art*

1. First lesson.

- a. The teacher will say, “We are going to write a narrative account about an incident that took place in your own life. It may be happy or traumatic; the choice of incident is yours. I will model an autobiographical incident from my own life using descriptive, vivid, and sensory details (Incidents will be recorded in an interview by the researcher to be included in Appendix B).
- b. The teacher will say, “I would like to ask you to conduct a memory search for five minutes, recalling a specific incident from your life that stands out and that was meaningful to you. Just quickly write down whatever spontaneous words come to your mind.” The teacher will write down the words that came to mind during the sharing of the teacher’s memories. If there are questions, the teacher will quietly move to the student, answering any questions with a reply like, “Just quickly jot down any words that come to mind. They do not have to make sense to anyone but you.”
- c. After five minutes, the teacher will say, “If you are comfortable sharing your words, I would like to ask you to present the word choices to our group.” After voluntary word choices are presented by students, the teacher will say, “You have made some excellent and interesting descriptive, vivid, and sensory word choices.” Teacher may give corrective feedback and scaffolding as teacher sees fit.

- d. The teacher will say, “I would like to ask you to exchange word choices with a partner. As your partner is speaking, make notes to tell your partner later. Were the words interesting and thought-provoking? Did the words remind you of things that happened in your own life? Please tell partner anything else that you think would be helpful in a polite way.” After five minutes the teacher will say, “Now we will reverse the process with the partner.” The process will be repeated with the other partner.
- e. The teacher will say, “I would like to ask you to create a graphic organizer. Put a circle in the center and write your main ideas in the circle. Make branches of the circle like a sunburst. On the lines branching out, write your ideas about the event on each of the branches. You can keep branching out ideas like tree limbs, working out and out.” Give about 10 minutes for this process.” Then the teacher will say, “Put your graphic organizers to the side.” The teacher will roam the room and determine whether the graphic organizers are being utilized according to directions. When the teacher gathers the materials together after the lesson, the teacher will determine whether or not students correctly followed the process for creating the graphic organizer. If not, the teacher should reteach the graphic organizer directions and make sure that each student has a correct sunburst type graphic organizer.
- f. The students will be given simple art materials such as pencils, colored pencils, colored crayons, and felt-tipped markers. The teacher will say, “I would like to ask you to draw a picture called an illustration of the specific incident that you wrote about.” The teacher need not make comments about the artistic merit of the

work. It is simply meant as an aid for the memory search. Students will be given fifteen minutes for the illustrations. The teacher will say, “Now can you look at the visual image and see what new words you think of while you are looking at the illustration or that you thought of when you drew the illustration and write them down with your other words.” The teacher will place each student’s materials in a file folder using A, B, C, etc., as identification and will keep the key to student identities in a locked drawer or cabinet.

2. Second Lesson

- a. The teacher will return the folders and art materials to the students. The teacher will reteach the graphic organizer directions from the previous lesson if deemed necessary. The teacher will say, “Today you will add to the illustration that you were working on last time we were together. Draw whatever comes to mind about the specific incident you are thinking of. You may also start new illustrations about the incident if you like. As you are working, can you add any new words to the graphic organizer you were working on? Think of any new words that you would like to add to your other words?” Give students about 10 minutes for this step.
- b. Now I would like to ask you to put words together in groups of words that make sense together without actually making complete sentences.” Allow about 10 minutes for this step.
- c. The teacher will ask the students, “Will you take the words you have put together into complete sentences? Do not worry about your grammar or punctuation yet. Just let your ideas flow about what word to put together into sentences.”

- d. The teacher will say, “Would you like to share some of your sentences with the class?” Allow time for those students who wish to share their complete sentences to do so.
 - e. The teacher will say, “Now let us begin a rough draft of a narrative can turn into a short story or even a book if you like. Take the sentences and put them together into a little story, or narrative. Leave a space between each line so words can be added later if you think of more words, phrases, or sentences. The teacher will roam the room, encouraging students to ask questions or share with the teacher. About 10 minutes can be devoted to the beginning of the narrative.
3. Third Lesson
- a. The teacher will pass out art materials. The teacher will say, “Today we will continue to work on our narratives. You may write for a while, add to your previous illustrations, and go back and forth. If you like, you may start and work on a new illustrations, or finish the old one. I will come around the room and give you feedback when you like. Just get my attention silently by raising your hand or making eye contact.” Students will be allowed to write and draw for twenty minutes or so.
 - b. After twenty minutes of writing, the teacher will say, “Class, think of a caption for your illustration(s) and write underneath the illustration. Sign the illustration in the lower right hand corner (students will take the file with them when they leave).
 - c. The teacher will say, “Now we will publish your narrative, making a clean and finished copy. As you continue to work, you can change the rough draft. I will

help you to revise and edit your narratives. Revision and editing go hand in hand.

While you are editing the final draft, more words may be added to the work.

There are many ways to publish your work. We have binding materials to put your narrative books together or you may think of another way of presentation, such as stacking up all the pages and tying them in a bow. Whatever way you prefer is fine.”

- d. After 20 minutes or so, the teacher will say, “I would like you to present your published narrative to the group. If you do not wish to do so, that is fine. I can present it for you, if you wish.” Allow the remaining time for students to present their narratives to the group. The teacher will say, “It has been such a pleasure to get to know you. Thank you so much for working so hard and for sharing all of your interesting memories, writing, and art with all of us. You may take your folders home with you and do what you wish with them.”

REFERENCES

- Algina, J., & Keselman, J. H. (1997). Detecting repeated measures effects with univariate and multivariate statistics. *Psychological Methods, 2*, 208-218.
- American Psychiatric Association. (*Diagnostic and Statistical Manual of Mental Disorders* (4th ed.) (2006). Arlington, VA: American Psychiatric Association. Retrieved from <http://www.dsm.psychiatryonline.org>.doi: 10.1176/app.books.9780890425596.514988
- Amini, M. (2005). Identifying stressors and reactions to stressors in gifted and non-gifted students. *International Education Journal, 6*(2), 136-140.
- Barnett, J. E., & Francis, A. L. (2011). Using higher order thinking questions to foster critical thinking: a classroom study. *Education Psychology: An International Journal of Experimental Educational Psychology, 32*(2), 201-211.
- Bartholomae, D., & Hull, G. (1986). Teaching writing. *Education Leadership, 21*, 44-52.
- Baum, S. (2004). *Twice-Exceptional and Special Populations of Gifted Students*. Thousand Oaks, CA: Corwin Press.
- Bernhardt, P. (2009). Opening up Classroom Space: Student voice, autobiography, & the curriculum. *The High School Journal, 92*(3), 61-67.
- Besnoy, K. D. (2009). Twice-exceptional students: Fostering their untapped talent. *Friends for Gifted Education Newsletter, 9*(2), 1-4.
- Boals, A. (2012). The use of meaning making in expressive writing: When meaning is beneficial. *Journal of Social and Clinical Psychology, 31*(4), 98-102.
- Boldt, G., Gilman, S., Kang, S., Olan, E., & Olcese, N. (2011). Having words: Contrasting perspectives on children's writing through the history of language arts. *Language Arts, 88*, 439-448.

- Bourke, L., & Adams, A. (2010). Cognitive constraints and the early learning goals in writing. *Journal of Research in Reading, 33*(1), 94-110.
- Brovero, M. D. (2004). For a clearer view. *Book Links, 13*(5), 45-46.
- Centers for Disease Control and Prevention. (2014). *Autism spectrum disorder*. Retrieved from <http://www.cdc.gov/ncbddd/autism/topics.html>
- Chang, P. L., Davies, P. L., & Gavin, W. J. (2009). Error monitoring in college students with attention deficit/hyperactive disorder. *Journal of Psychophysiology, 23*(3), 113-125.
- Chapman, T. K., Hobbel, N., & Alvarado, N. V. (2011). Real-time teaching: A social justice approach as a base for teaching writing. *Journal of Adolescent & Adult Literacy, 54*(7), 539-541.
- Cochrane, C. (2004). Landscapes for learning. *Education Leadership, 62*(1), 78-81.
- Colangelo, N., Kelly, K. R., & Schrepfer, R. M. (1987). A comparison of gifted, general, and special learning. Retrieved from <http://www.onlinelibrary.wiley.com/doi/10.1002>, 23(6), 73-77.
- Cramond, B. (2004). Can we, should we, need we agree on a definition of giftedness? *Roepers Review, 27*(1), 15-16.
- Crisman, B. W. (2008). Inclusive programming for students with autism, *Principal, 12*, 28-32.
- Cronk, B. C. (2008). *How to Use SPSS*. Glendale, CA: Pyczak Publishing.
- Davis, K. (2003). Writing autobiography. *Writing! 20*(9), 9-11.
- Davidson, M. L. (1972). Univariate versus multivariate tests in repeated-measures experiments. *Psychological Bulletin, 77*, 446-452.

- Deuja, A., Kohn, N. W., Paulus, P. B., & Korde, R. M. (2014). Taking a broad perspective before brainstorming. *Group Dynamics: Theory, Research, and Practice, 18*(3), 222-236.
- Dunn, M. W., & Finley, S. (2010). Children's struggles with the writing process: Exploring storytelling, visual arts, and keyboarding to promote narrative story writing. *Multicultural Education, 18*(1), 33-42.
- Eckhoff, A., & Urbach, J. (2008). Understanding imaginative thinking during childhood: sociocultural conceptions of creativity and imaginative thought. *Early Childhood Education Journal, 36*(04), 179-185.
- Essary, J. N. (2012). Teaching strategies: Teaching beyond the basics: Young students participate in a cognitive apprenticeship. *Childhood Education, 88*(5), 331-334.
- Fang, Z. (1999). Expanding the vista of emergent writing research: Implications for early childhood educators. *Early Childhood Education Journal, 26*(3), 179-182.
- Fartoukh, M., Chanquoy, L., & Piolat, A. (2012). Effects of emotion on writing processes in children. *Written Communication, 29*(4), 391-411.
- Field, A. (2009). *Discovering Statistics Using SPSS*. Thousand Oaks, CA: SAGE Publications Inc.
- Friedlander, D. (2008). *Sam Comes to School: Including Students with Autism in Your Classroom*. Ridgefield, CT: Heldorf Publications.
- Fuchs, D., & Fuchs, L. S. (2007). Model for implementing responsiveness to intervention for exceptional children, *Teaching Exceptional Children, 39*(5), 14-20.
- Georgiou, G., Das, J. P., & Hayward, D. V. (2008). Comparing the contribution of two tests of working memory to reading in relation to phonological awareness and

- rapid naming speed. *Journal of Research in Reading*, 31(3), 302-318.
- Gilger, J. W., & Kaplan, B. J. (2008). Atypical brain development: A conceptual framework for understanding developmental learning disabilities. *Development Neuropsychology*, 20(2), 465-481.
- Gould, J., Staff, L.K., & Theiss, H. M. (2012). The right fit for Henry. *Educational Leadership*, 69 (5), 71-73.
- Graham, S., Harris, K. R., Fink-Chorzemper, F., & MacArthur, C. (2003). Primary grade teachers' instructional adaptations for struggling writers: A national survey. *Journal of Educational Psychology*, 95(2), 279-292.
- Gregory, T. (2011). Teaching students with learning disabilities and attention deficit hyperactive disorder. In Vaughn, S. R., Bos, C. S. & Schumm, J. S. (Eds.), *Teaching students who are exceptional, diverse, and at risk in the general education classroom* (pp. 145-173). Upper Saddle River, NJ: Pearson Education.
- Hallahan, D. P., Kauffman, J. M., & Pullen, P. C. (1997). *Exceptional learners: Introduction to special education* (7th ed.). Boston, MA: Allyn and Bacon.
- Hayward, D., Das, J. P., & Janzen, T. (2007). Innovative programs for improvement in reading through cognitive enhancement: A remediation study of Canadian first nations children. *Journal of Learning Disabilities*, 40(5), 443-457.
- Heuristic. (2002). CogAT Form 6: A Short Guide for Teachers. Retrieved from <http://www.riverpub.com/products/cogAt/pdf/cogATshort.pdf>
- Hillocks, G. (1987). Synthesis of research on teaching writing. *Educational Leadership*, 36(2), 120-132.

- Hobson, E. H. (2002). Teaching the language that I/my students see. In K. S. Fleckenstein, L. T. Calendrillo, and D. A. Worley (Eds.), *Language and Image in the Reading-Writing Classroom* (pp. 105-118) Mahwah, NJ: Lawrence Erlbaum Associates.
- Holland, A. C., & Kensinger, E. A. (2010). Emotional and autobiographical memory. *Physics of Life Reviews*, 7(1), 88–131.
- Horner, R. H., Car, E. G., & Halle, J. (2005). The use of single-subject research to identify evidence-based practice in special education. *Exceptional Students*, 71(2), 165-179.
- Hull, G., & Bartholomae, D. (1986). Teaching writing. *Educational Leadership*, 43(7), 44-54.
- Huitt, W., & Hummel, J. (2003). Piaget's theory of cognitive development. *Educational Psychology Interactive*. Valdosta, GA: Valdosta State University.
- Individuals with Disabilities Education Improvement Act (2004). IDEA 20 U. S. Code § 1401(c)(5)(f): Retrieved from U. S. Department of Education website: <http://www. Idea.ed.gov/download/state.html>.
- Iovannone, R., Dunlap, G., Huber, H., & Kincaid, D. (2003). Effective educational practices for students with autism spectrum disorders. *Focus on Autism and other Development Disabilities*, 18(3), 150-165.
- Jackson, P. S., & Moyle, V. F. (2009). With Dabrowski in mind: Reinstating the outliers in support of full-spectrum development. *Roeper Review*, 31, 150-160.

- Johnstone, S. (2001). Creative writing for early education. *Montessori Life*, 31(4), 48-49.
- Karnes, F. A., & Bean, S. M. (2009). Leadership and the Gifted. *Focus on exceptional children*, 29(1), 1-12
- Karnes, F. A., Shaunessy, E., & Beland, A. (2009). Gifted students with disabilities: Are we finding them? *Gifted Child Today*, 27(4), 17-21.
- Koerth-Baker, M. (2013). The not-so-hidden cause behind the A.D.H.D. epidemic, *The New York Times Magazine*. Retrieved from <http://www.nytimes/pages/magazine.com>
- Kong, S., & Hoare, P. (2011). Cognitive content engagement in content-based language teaching. *Language Research*, 15(3), 307-324.
- Kuczynski-Brown, A. (2012). Most U. S. students lack writing proficiency, National Assessment of Educational Progress finds. Retrieved from <http://www.huffingpost.com>.
- Lambert, M., & Carpenter, M. (2005). Visual learning: Using images to focus attention, evoke emotions, and enrich learning. *Multimedia & Internet @ Schools*, 12(5) 20- 24.
- Lee, C. C., & Tan, S. C. (2010). Scaffolding writing using feedback in students' graphic organizers-novice writer' relevance of ideas and cognitive loads. *Educational Media International*, 47(2), 135-152.
- Lee, G., & Schallert, D. (2004). Constructing trust between teacher and students through feedback and revision cycles in an EFL writing classroom. *Written Communication*, 25(4), 506-537.

- Lohman, D. (2012). *Cognitive Functions Test TM (CogAT®) Form 7 Assessment*. Rolling Meadows, IL: Riverside Publications.
- Lohman, D. F., & Lakin, J. M. (2009). Consistencies in sex differences on the Cognitive Abilities Test across countries, grades, test forms, and cohorts. *British Journal of Educational Psychology, 79*, 389-407.
- Marsh, H. W., & Hua, K. T. (2003). Big-fish-little-pond effect on academic self-concept. *American Psychologist, 59*, 269-271.
- Marteski, F. (1998.) *Developing student ability to self-assess* (Doctoral dissertation). Retrieved from <http://www.lib.usm.edu>.
- McGroarty, M. E., & Zhu, W. (1997). Triangulation in classroom research: A study of peer revision. *Language Learning, 47*(1), 1-43. doi:10.1111/0023-8333.11997001
- Mississippi Autism Advisory Committee. (2012). Retrieved from <http://www.amcph.org/programsandtopics>.
- MS Code § 37-169-1 (2013). Retrieved from <http://www.dmh.state.ms.us/pdf/MAAC>
- National Capital Language Resource Center. (2004). Assessing learning: Peer and self-assessment. Retrieved from <http://www.nclrc.org//assessing/peereval.htm>.
- National Center for Education Statistics. (2012). *The Nation's Report Card: Writing 2011* (NCES 2012-470). Institute of Education Sciences, U. S. Department of Education. Washington, DC: Government Printing Office.
- Neu, T. (2003). When the gifts are camouflaged by disability: Identifying the talent in gifted students with disabilities. In J. A. Castellano (Ed.) *Special Populations in Gifted Education: Working with Diverse Gifted Learners* (pp. 151-161), Boston, MA: Allyn & Bacon.

- Nicol, D. J., & Macfarlane-Dick, D. (2006). Formative assessment and self-regulated learning: A model and seven principals of good feedback practice. *Studies in Higher Education, 31*(2), 119-218.
- Nicpon, M. F., Allmon, A., Sieck, B., & Stinson, R. D. (2011). *Gifted Child Quarterly, 55*(1), 3-17.
- Nicpon, M. F., Assouline, S. G., Schuler, P., & Amend, E. R. (2010). Gifted and talented students on the autism spectrum: Best practices for fostering talent and accommodating concerns, In Castellano, J., & Frazier, A. D (Eds.), *Special Populations in Gifted Education: Understanding Our Most Able Students from Diverse Backgrounds* (pp. 227-248). Waco, Texas: Prufrock Press.
- O'Donnell, W. J. (2002). The effects of multisensory vowel instruction during word study for third-grade students. *Reading Research Quarterly, 42*(4), 468-470.
- Olthouse, J. (2012). Talented young writers' relationships with writing. *Journal for the Education of the Gifted, 35*(1), 66-80. doi: 0162353211432039
- Parker, D. R., & Boutelle, K. (2009). Executive function coaching for college students with learning disabilities and ADHD: A new approach for fostering self-determination. *The Division for Learning Disabilities of the Council for Exceptional Students, 24*(4), 204-215.
- Persson, R. S. (2012). Cultural variation and dominance in a globalized knowledge-economy: towards a culture-sensitive research paradigm in the science of giftedness. *Gifted and Talented International, 27*(1), 15-48.
- Peterson, S. S., & McClay, J. (2010). Assessing and providing feedback for student writing in Canadian classrooms. *Assessing Writing, 15*(2), 86-99.

- Preckel, F., Holling, H., & Wiese, M. (2005). Relationship of intelligence and creativity in gifted and non-gifted students: An investigation of threshold theory. *Department of Psychology, Ludwig-Maximilians-Universitat (LMU)*. Retrieved from <http://www.sciencedirect.com>
- Rabner, D. (2006). Educational rights for children with ADHD/ADD. Retrieved from [http://www.helpforadd.com/educational rights](http://www.helpforadd.com/educational%20rights).
- Ray, K. W. (1999). *Wondrous Words: Writers and Writing in the Elementary Classroom*. Urbana, IL: National Council of Teachers of English.
- Read, S. (2010). A model for scaffolding writing instruction: IMSCI. *The Reading Teacher*, 64(1), 47-52.
- Reading First Virginia. (2014). Reading First: A guide to phonemic awareness instruction. Retrieved from http://www.readingfirst.virginia.edu/prof_dev/phonemic_awareness.
- Reis, S. M., & Sullivan, E. E. (2009). Characteristics of gifted learners. In F. A. Karnes, & S. M. Bean (Eds.), *Methods and Materials for Teaching the Gifted* (pp. 3-29). Waco, TX: Prufrock Press.
- Renzulli, J. S. (1977). *The Enrichment Triad Model: A Guide for Developing Defensible Programs for The Gifted and Talented*. Mansfield Center, CT: Creative Learning Press.
- Richardson, J. T. (1985). A Handbook of Cognitive Psychology (Book Review). *British Journal of Psychology*, 76(3), 403.
- Rief, L. (1990). Finding the Value in Evaluation: Self-Assessment in a Middle School Classroom. *Educational Leadership*, 47(6), 24.

- Robison, J. E. (2012). Call me different, not difficult. *Educational Leadership, 10*, 40-44.
- Sansoti, F. J. (2010). Teaching social skills to students with autism spectrum disorders using tiers of support: A guide for school-based professionals. *Psychology in the Schools, 47*(3), 257-281.
- Schwartz, A., & Cohen, S. (2013). More diagnoses of A.D.H.D. causing concern. Retrieved from <http://www.nytimes.com>
- Schunk, D. H., & Swartz, C. W. (1993). Writing strategy instruction with gifted students: effects of goals and feedback on self-efficacy and skills. *Roeper Review, 15*, 225-230.
- So Yoon, Y., & Gentry, M. (2009). Racial and ethnic representation in gifted programs. *Gifted Child Quarterly, 53*(2), 121-136.
- Spears, C. (2014). Gifted regulations and standards overview. Retrieved from <http://www.mde.K12.ms.us/curriculum-and-instruction/advanced>.
- Stagey, J. T., & Ross, B. M. (1975). Scheme and Schema in children's memory of their own drawings. *Development Psychology, 11*(1), 37-41.
- Texas State Library and Archives. (2007). Step by step through the writing process. *Writing, 30*, 1-8.
- U. S. Department of Education. (1999). Office of Educational Research and Improvement. National Center for Education Statistics. *The NAEP 1998 Writing Report Card for the Nation and the States*. NCES 1999-462, by E. A. Greenwald, H. R. Persky, J. R. Campbell, and J. Maseo, Washington, DC.

- U. S. Department of Education. (2002). Institution of Education Sciences. National Center for Education Statistics. *The Nation's Report Card: Writing Highlights 2002*, NCES 2003-31, by National Center for Education Statistics. Washington, D.C.
- U. S. Department of Education. (2011). The Nation's report card: Writing 2011, retrieved from: <http://nces.ed.gov>
- U.S. Department of Health & Human Services. (2011). Autism information. Retrieved from <http://www.idea.ed.gov/explore/view/p/,root,regs,300,A,300%252E8>. Content created by Assist. Sec./Public Affairs - Digital Communications Division. Content last reviewed on April 6, 2011.
- Van den Bergh, L., Ros, A., & Bejjaard, D. (2013). Feedback during active learning: Elementary school teachers' beliefs and perceived problems. *Educational Studies*, 39(4), 418-430.
- Villa, J., & Calvo, R. A. (2011). Concept maps as cognitive visualizations of writing assignments. *Education Technology & Society*, 14(3), 16-17.
- Wade, L. K. (2005). An analysis of the effects of a peer feedback procedure on the writing behavior of sixth grade students (Doctoral dissertation). Retrieved from <http://www.lib.usm.edu>.
- West Virginia Department of Education (2004). Writing across the curriculum, retrieved from <https://www.wv.us/strategy>.
- Weyandt, L. L., & DuPaul, G. J. (2008). ADHD in college students: Development findings, *Developmental Disabilities Research Reviews*, 14, 311-319.

- White, T. G., (2005). Effects of systematic and strategic analogy-based phonics on students' word reading and reading comprehension, *40*(2), 234-255.
- Wikipedia. (2014). *Illustration*. Retrieved from <http://www.en.wikipedia.org/wiki/Illustration>.
- Wilson, M. (2007). The view. *Educational Leadership*, *12*(1), 76-80.
- Writing Center at Chapel Hill. (2012). Brainstorming. Retrieved from <http://www.writingcenter.unc.edu>.
- Writing Center at Elon University. (2014). Brainstorming techniques. Retrieved from <http://www.elon.edu>.
- Yilmaz, K. (2011). The Cognitive Perspective on Learning: Its Theoretical Underpinnings and Implications for Classroom Practices. *The Clearing House*, *84*, 204-212.
- Young, G. (2011) Cognition. Editor (Ed.). *The Encyclopedia Britannica* (15th ed.). Retrieved from <http://www.encyclopedia Britannica.com/bps/search/query/cognition>.
- Yssel, N., Prater, M., & Smith, D. (2010). How can such a smart kid not get it? Finding the right fit for twice-exceptional students in our schools, *Gifted Child Today*, *33*(55-61).
- Zhenhui, R. (2007). Training in brainstorming and developing writing skills. *ELT Journal: English Language Teachers Journal*, *61*(2), 100-106.
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