COMPREHENSION OF PICTURES IN CONTENT AREA TEXTS IN THE ELEMENTARY GRADES

by

Samantha D'Amaro

A Master's Thesis/Project Capstone
Submitted in Partial Fulfillment
of the Requirements for the Degree of
Master of Science in Education
Literacy Birth-Grade 12
Department of Language, Learning and Leadership
State University of New York at Fredonia
Fredonia, New York

May 2016

State University of New York at Fredonia
Department of Language Learning and Leadership

CERTIFICATION OF THESIS/PROJECT CAPSTONE WORK

We, the undersigned, certify that this project entitled COMPREHENSION OF PICTURES IN CONTENT AREA TEXTS IN THE ELEMENTARY GRADES by Samantha D'Amaro, Candidate for the Degree of Master of Science in Education, Literacy Birth to Grade 12, is acceptable in form and content and demonstrates a satisfactory knowledge of the field covered by this project.

[redacted]

Dr. Cindy Bird, PhD.
Master's Capstone Advisor
EDU 659 Course Instructor
Department of Language, Learning, and Leadership

April 28, 2016
Date

[redacted]

Dr. Cindy Bird, PhD.
Department Chair
Department of Language, Learning, and Leadership

May 19, 2016
Date

[redacted]

Dean Christine Givner, PhD.
College of Education
State University of New York at Fredonia

June 15, 2016
Date

COMPREHENSION OF PICTURES IN CONTENT AREA TEXTS

IN THE ELEMENTARY GRADES

ABSTRACT

Although recent reading programs such as Let's be Friends by Houghton Mifflin (2001) and the Common Core Modules (Common, 2012) emphasize learning to read the words (the "print") and seem to ignore the reading of illustrations (the "visuals"), emergent readers first learn to "read" by reading visuals not words. Therefore early childhood educators should be aware of "image reading" when they are "considering the kinds of meaning making children do with books prior to conventional reading" (Lysaker & Hopper, 2015, p. 650). The problem related to this reading of visuals is teachers not understanding students' process for comprehension of images, and that leads to the secondary problem of teachers not being able to assist students in the comprehension of complex texts which contain pictures, illustrations, and images. Both of these problems can be addressed by asking the research question of how the comprehension of pictures develops and assists children to comprehend expository texts as the children progress through elementary school. To address this research question, a research synthesis was conducted. The results show two sets of findings: that a developmental continuum appears to exist for the comprehension of visuals, and that there are some instructional strategies for enhancing comprehension along the continuum.

TABLE OF CONTENTS

Chapter 1: Introduction

Statement of Problem

Recent reading programs such as *Let's be Friends* by Houghton Mifflin (2001) and the Common Core Modules (Common, 2012) emphasize learning to read the words (the "print") and seem to ignore the reading of illustrations (the "visuals"). While these reading programs strongly rely upon the text (words), emergent readers first learn to "read" by reading visuals not words. According to Lysaker and Hopper (2015), "children rely heavily on the reading of images to make sense of picture books" (p. 650). Therefore early childhood educators should be aware of "image reading" when they are "considering the kinds of meaning making children do with books prior to conventional reading" (Lysaker & Hopper, 2015, p. 650). However, while students use the illustrations or visuals to comprehend a text, teachers may not be aware of precisely how students use visuals to assist them in comprehension. Teachers may also not be aware of the development of children's ability to "read" and "comprehend" or "make meaning" from pictures or how making meaning from pictures can become a more complex process as children grow and gain more literacy experience. This problem, then, of teachers not understanding students' process for comprehension of images leads to the secondary problem of teachers not being able to assist students in the comprehension of complex texts which contain pictures, illustrations, and images. Both of these problems can be addressed by asking the question, how does the comprehension of pictures develop and assist children to comprehend expository texts as the children progress through elementary school? To address this research question, I will conduct an extensive literature review, synthesize the research findings, and disseminate the results to teachers by some form of professional development.

Background

My own teaching experience working with students in my graduate literacy practicum hours and with students in my two student teaching placements has shown me that students appear to use the pictures in a text to assist them with comprehension of the whole text. Currently, I am working with a kindergarten student who is unable to read words. While I read *The Little Engine*

That Could by Watty Piper (1930) to this student, I asked him where I should read next when I turned the page. Without hesitation, he immediately pointed to the picture. The student then went on to tell me what he saw in the picture before I started to read the words aloud. The student pointed out all of the objects he saw on the page: a giraffe, teddy bears, elephants, dolls, and a clown. After he told me what it was that he saw on the page, I then read the words on that page; they described everything in one of the train cars that the little engine was pulling, and everything the student had just "read" in the picture. In addition, my other job as a Recreation Director provided me with the chance to work with young children and their drawings. I watched the children create their own drawings and paintings. Frequently children gave me the pictures they had drawn and explained their drawings and paintings to me as a form of storytelling. These interactions with young students reading and writing with visuals started me thinking about picture books, reading pictures, and constructing meaning. I think these topics are very interesting, and that is why I have selected this topic for my research.

Terminology

To assist the reader with a better understanding of this topic, key terms for this research study are defined below. Several key terms are used and discussed throughout this research in reference to the comprehension of pictures in content area texts in the elementary grades. Key terms include *picture book, text, reading continuum, and comprehension.* According to Bishop and Hickman (1992), a *picture book* is a "fiction book with a dual narrative, in which both the pictures and the text work interdependently to tell a story. It is a tale told in two media, the integration of visual and verbal art" (p. 2). This definition has been chosen for this research because it clearly distinguishes between the two aspects of a text – the visual and the words. This distinction is important for this research which is examining both the visual and words as elements of comprehension. Another term included in this research is *text,* defined as "the words that make up the main part of a book, magazine, newspaper, etc." (*Text,* 2010). In this thesis, the word *text* will be used in two different ways: *"text"* meaning the entire piece of work (words and pictures) which is read, and *"text-words"* meaning just the words within the text of a picture book or expository work which is read. Another term frequently used in this thesis is *reading continuum.* According to the Pacific Resources for Education and Learning (2013), "The Stages of Reading

Development is a continuum that explains how students' [sic] progress as readers" (p. 1, para. 1). These stages emerge from a student's reading experiences and not the student's age or grade level. Another term that is included within this thesis is *comprehension*. Parris and Parris (2003) claim "meaning-making" is another way of explaining the term *comprehension*, while Kucer (2014) states that *comprehension* involves readers "getting the author's intended meanings from the print" (p. 10). Combing these two perspectives creates the definition for *comprehension* chosen for this research study, where comprehension is a way in which readers can connect with the author or illustrator to make a meaning.

Theoretical Stance

The problem of pictures and comprehension falls under the broad category of psychological foundations of literacy. More specifically, the theoretical stance for this research is the theory of literacy as a cognitive function. Kucer (2014) explains reading as "incorporating 'multimodal systems' to construct meaning of a text" (p. 24). This function includes comprehension, or meaning making, using prior knowledge and semiotics (signs and symbols) to produce meaning. Semiotics refers to something in an illustration or picture book that represents something else. Kucer (2014) explains three types of sign systems: "iconic, indexical, and symbolic" (p. 25). Kucer also explains that in picture books, some illustrations are "iconic in nature" (p. 25). According to Kucer (2014), "icons are signs in which the physical property of the surface structure resembles the meaning being conveyed" (p. 25). In other words, the physical property of an illustration within a picture book does not have a deeper meaning than connecting to the real object portrayed in the picture. The second sign system is indexical. Indexical, according to Kucer (2014), "contains physical aspects that are related to the conveyed concept" (p. 25). The reader of the picture book has to use his or her cognitive ability to analyze what the illustrator is trying to communicate to the reader. For example, in a picture of a house with smoke coming from the chimney, the smoke is an indexical sign that someone is at home and living in the house. The third sign system is symbolic. Kucer (2014) sees "an arbitrary yet systematic correspondence between a symbol's physical properties and what it represents" (p. 25). In other words, in order to make meaning from the sign, the reader must think beyond the outer appearance of a picture to what it represents. For example, a red octagon with the white letters "S

T O P" has been arbitrarily assigned the meaning of "cease the motion of your car" – this meaning exists only in the system of signs (the context) in which it is a part. Some visuals in picture books carry meaning only because they are part of a system (set) of signs assigned a meaning in a certain context: for example, the red of the stop sign means "stop" but the red of a firetruck means "fire."

Rationale

Of the 50 United States, 41 have adopted the Common Core State Standards (Common, 2012). The goal of Common Core State Standards is to assist students to progress in school to become "college and career ready" (p. 1), so that once they complete their schooling, they will be "able to read and comprehend independently and proficiently the kinds of complex texts commonly found in college careers" (Common, 2012, p. 2). Particularly relevant to this research study is Common Core Standard #10 that addresses text complexity on its own, resulting in text complexity becoming an increasingly important factor in all students' literacy growth. According to Unsworth and Macken-Horarik (2015), "students across grade levels clearly understand meaning-making images and can deploy knowledge in interpreting significance of the images to the thematic concerns stories" (p. 75). It is clear that students exhibit the ability to "read" a picture in the context of a picture book and make meaning (understand/comprehend) of the story in a picture book. However, the Common Core State Standards have put a high emphasis on comprehension. Picture books are a main form of literature in the primary grades; once teachers have a better understanding of how students use pictures to comprehend increasingly complex texts, teachers can assist struggling readers in the future.

Chapter 2: Literature Review

An extensive literature review was conducted to address the question of how the comprehension of pictures develops and assists children to comprehend expository texts as the children progress through elementary school. The major academic and education databases were searched using key words such as *picture book, text, emergent reader, illustration, reading continuum,* and *comprehension.* The major education databases including ERIC, PsychINFO, Academic Search Complete, JSTOR, and Education Source Complete were searched but fewer than 20 relevant studies were found. In order to track the development of a child's comprehension of pictures as the child progresses through school, the found studies have been grouped below according to the age and grade of the participants. The first group specifically examines Pre-Kindergarten and Kindergarten students; the second group specifically examines grades one to five students. The third groups of studies in this review are those studies with participants from a range of multiple grades and ages.

Pre-Kindergarten and Kindergarten Students

The studies reviewed in this section are those that work with participants who are five years old or younger, kindergarten and pre-kindergarten age students. An extensive search of the literature has found extremely few studies that focus on the visual comprehension abilities of emerging readers; most of the research appears to be in the area of linguistic development. However, three studies were found. Allen, Mattock, and Silva (2014) explored the early beginnings of "symbolic understanding" (p. 187) of both pictures and words. They wanted to explore a child's ability to use symbols, that is to understand that something (a symbol such as a picture or a word) could represent (or stand for) a real world object. Their purpose was to determine whether "symbolic skills" (p. 187) developed together or separately. If they developed together, then a child's ability to read (to understand words as meaning-carrying symbols) would be interconnected or perhaps dependent upon a child's ability to comprehend pictures (to understand that they too were meaning-carrying symbols). Participants were 30 (15 male, 15 female) "typically developing children" (p.189) between the ages of two and four years. The experiment involved the children matching 20 actual toys (real world objects) with sets of corresponding words and pictures (the

symbols). Results indicated that "overall, participants were more successful" (p. 192) matching the pictures to objects than the words to objects, which suggested that young children understand the connection between a picture and what it represents "earlier than they understand" (p. 194) the written word as representing a real world object. The researchers concluded that these symbolic skills do not develop at the same time but they are "correlated" (p. 194). "Interestingly" (p. 194) to the researchers, they "did not find" (p. 194) a relationship between language development and symbolic understanding.

Looking specifically at books and literacy, Dooley (2010) conducted a three-year longitudinal study on 12 children ranging from two to five years old, or children at the pre-kindergarten and kindergarten age. Dooley wanted to research the "developmental formations" (p. 123) of the participants' literacy meaning making abilities. Data were collected for the longitudinal study through observational field notes, video recordings of the children, and interviews with their parents. Observations of the children prior to age two and early age three found that those children "routinely used books as a prop" (p. 125), meaning that they paid "little attention" (p. 125) to the content or topic of the book and mostly used it as a toy. At this age, the children had little to no meaning making. As the children grew, observations showed children slowly beginning to view books as an "invitation" (p. 125). Children began to notice "attention to images, content, and recognition to print" (p. 125). By the age of mid three through four years old, these children appeared to view a book as a "script" (p. 125). They noticed, "content, images, and print" (p. 125) as well as even mimicked read alouds and played "teacher." Children at this age began to make meaning and form comprehension development. From age four to five years old, children appeared to view books as "text" (p. 125), meaning they had begun understanding the "concept of print" (p. 125). Data analysis revealed that as children progressed in age, they were able to comprehend "multiple sign systems" (p. 128) within picture books; multiple sign systems meaning the image, the language, and printed words (text-words). According to Dooley, somewhere between the age of late three years through five years, children begin to understand the concept of illustrations and print (text-words) and understand that those two are somehow connected within a picture book to make meaning. Children in the pre-kindergarten and kindergarten age range create meaning making and connect images to text-words. Therefore, children appear to progress from viewing a book as a prop to viewing a text "holistically" (p. 126). Children start to think of the text-words within a book and the

illustrations within a book as a single unit – a "book."

Also conducting a longitudinal study, Hsiao (2010) worked with 27 Taiwanese children ranging in age from four to five years old (pre-kindergarten range) and their parents (or guardians) over a 16 week period. Hsiao wanted to explore ways that would "enhance kindergarteners' creative thinking" (p. 143) by discussing illustrations. The study consisted of conducting a read aloud, during which the researcher discussed the illustrations and text-words as part of a "picture book appreciation" (p. 150). After completion of the read aloud, the participants were asked to draw freely for a given period of time, and then discuss with the group what they had drawn. These discussions were a form of sharing their artwork through what Hsiao called "art talks" (p. 147). These read alouds and art talks were video taped as data. Other data were collected from journaling by the researchers and questionnaires completed by parents/guardians. Data analysis determined that the children were able to "interpret" (p. 147) pictures in picture books during read alouds. Because of the regular "picture book appreciation" (p. 150) sessions and their own "art talks" (p. 147), the children were able to regularly identify details within the picture book during read alouds and incorporate the idea of including details in their own drawings and "art talks" (p. 147). Data analysis revealed that 92% of the parents stated that their children created "spontaneous drawings" (p. 150) at home as a result of participating in this study: spontaneous meaning that children drew pictures without being asked or told to. Overall, results of this study indicate that picture book read alouds with art discussion and free drawing time appeared to enhance children's creative thinking and literacy development.

Elementary Grades One to Five Students

The research studies in this section specifically examine elementary school age students in grades 1 to 5 and their comprehension of pictures to assist them in the comprehension of expository texts**.** Before looking at studies in this elementary grade range, it is important first to gain an understanding of the expository texts (most often "textbooks") within this grade range. Sibanda and Sibanda (2013) wanted to explore the "extent to which grade four English textbooks facilitated the development of visual literacy through their presentation of visuals" (p. 39). Their study was conducted in the province of Eastern Cape in South Africa, where they analyzed five grade four textbooks:

A. Zwarts, M., Bester, M., Barnads, C. (2004). *Grade 4 My Clever First Additional Language through Issues. Learners' Book.* For the Revised National Curriculum Statement.

B. South Africa Department of Education. (2011). *Grade 4 English First Additional Language. (Term 1 and 2)* Pretoria.

C. Gardner, J. (2003). *English for All Learners' Book.* Macmillan: Boleswa Publishers.,

D. The Molteno project. (2004). *New Bridge to English Learners' Book Grade 4 Revised Curriculum.* Kagiso Education: Cape Town.

E. Gisela, W., Chitra, S., Peni, V. (2000). *My English 4 Learners' Book. Language, Literacy and Communication.* Shuter and Shooter: Pietermaritzburg. (p. 46).

These five textbooks were analyzed to assess how students in grade four were required to make meaning using both the visuals and the text-words. In regards to the overall visuals in all five textbooks, Sibanda and Sibanda found a lack of visuals; they stated that this lack was a "cause of concern" (p. 47) because they felt that visuals were what attracted young readers to a "written text" (p. 47) to first construct meaning. However, upon observation Sibanda and Sibanda found that all five of the selected textbooks had a "close relationship" (p. 50) of 70% or greater between the meaning of the visuals and that of the text. As the researchers explained, this relationship was possibly "because most visuals are a product of textual print and are meant to illustrate what the print narrates or describes" (p. 50). The researchers also found a range of 11% to 37% for "comprehensive detailed follow-up" (p.51), which they explained as "the deliberate attempt the books make to draw learners' attention to the visuals and ensure comprehension of the visuals" (p.0 51). These results indicated that while the majority of the visuals of these expository textbooks relate to and illustrate the text-words, only a small amount of the visuals "extend" (p.51) or enhance the content of the text-words. Sibanda and Sibanda concluded that very little attention was drawn to the visuals to allow students to "derive meaning and think critically" (p. 54). Although this textbook study was conducted in South Africa, it can provide American researchers with a model and framework for analyzing textbooks used in American elementary schools.

Returning to studies with elementary school age students and their comprehension of pictures to assist them in the comprehension of expository texts, Mantei and Kervin (2015)

investigated students' "interpretations" (p. 183) of the "messages conveyed" (p. 183) in the "almost wordless" (p. 183) narrative picture book, titled *Mirror* by Baker (2010). A total of 16 fourth grade students originally from Australia participated in the study. The "small sample size" (p. 186) was chosen from three different schools. Six students (two boys, four girls) were from an "inner urban suburb of low-mid socio-economic status" (p. 186); six other students (four boys, two girls) were chosen from an "urban suburb of low socio-economic multicultural status" (p. 186), and the four other students (two boys, two girls) were from an "urban suburb of mid-high socio economic status" (p. 186). This range of participants allowed the researchers to consider the influence of such variables as economic status, geographic location, and culture on the interpretation and comprehension of pictures. Part one of the research design was "independent reading" (p. 186) time where the students were all given a copy of the narrative picture book *Mirror* and asked to read in pairs. Part two was a group interview during which students "point out their first interpretations" (p. 187), or in other words, how they initially comprehended the story. The students and the research team then read the narrative picture book together to "further explore interpretations" (p. 187). Data were collected from the group interviews, and observations of the interviews and independent reading. Analysis of the data found that while the students read independently, they "identified" (p. 189) with the main characters, which are of "white Australian" (p. 189) descent. The students also made meaning by viewing the "'mirror'" (p. 189) as an actual "reflection of the characters" (p. 189). Overall, findings in this study suggest that narrative picture book images do play a role in fourth grade readers' comprehending meaning of a book, especially when it comes to an "almost wordless" picture book such as *Mirror*. In other words, the fewer the text-words, the more the fourth grade readers (regardless of their SES, location, or culture) rely on the pictures to construct meaning for the narrative text as a whole.

Another researcher, Swaggerty (2009), wanted to further research how a small group of "successful fourth grade readers" (p. 9) maneuvered themselves through five "postmodern" (p. 9) narrative picture books. The five "postmodern" (p. 9) picture books that were chosen for this study were: *The Three Pigs* (Wiesner, 2001), *Who's Afraid of the Big Bad Book?* (Child, 2003), *The Red Book* (Lehman, 2004), *Voices in the Park* (Browne, 1998), and *Black and White* (Macaulay, 1990). Out of the nine participants, five of them were females and three were males; seven were European American and one student was African American; all students attended a

large suburban elementary school. Data were collected during video transcripts, field notes, and think aloud sessions during ten group book club discussions that lasted an average of 50 minutes each. Analysis of the data found that the researchers coded "verbalizations regarding illustrative or font features" (p. 15) 101 times during book club sessions. In other words, the students discussed the way in which the words in the book along with the pictures looked visually while in group discussions the most. Overall, the students all displayed the ability to maneuver themselves through the five "postmodern" (p. 9) narrative picture books successfully. In general, Swaggerty (2009) suggests that while students are able to comprehend narrative texts independently, the students are not able to "understand complex plots" (p.26) while not in a group setting.

Moving from fourth grade to emergent readers, Sipe (2000) wanted to explore the concept of emergent readers' "literary understanding" (p. 259) by studying their verbal responses during narrative picture book read-alouds. Sipe conducted a randomized study with 27 first and second grade students (elementary grade) during a 7-month period. Of the 27 participants, seven of them participated in the free or reduced-price lunch program, and nine received remedial reading assistance. The 7-month study took place in three different "phases" (p. 263). Phase I was observation of narrative storybook read alouds where the teacher read aloud but the participants were not asked to contribute any responses. Phase II was audio-recording the narrative storybook read alouds where students were encouraged to respond orally. Phase III was observations without audio recording of whole group read alouds where the participants were again encouraged to respond orally. Data analysis was conducted using "open coding, axial coding, and selective coding" (p. 263) method. Analysis of the data from all 3 phases found that 73% of the students responded "analytically" to the illustrations of the picture books during all three phases of read-aloud groups. Analytically meant that the students "discussed and questioned the author's and illustrator's decisions and choices" (p. 264). Findings indicated that students were able to talk analytically about the decisions made by the illustrator and author when prompted to do so after the narrative storybook read alouds. Only 10% of the students were able to make "intertextual connections" (p. 266), meaning that the students had the ability to connect the text-words read aloud to other texts they had read prior to the study. Overall, results showed that first and second grade students had the ability to make analytical connections between words and illustrations during a narrative storybook read aloud, but had difficulty

making connections with other books previously read during narrative storybook read alouds. Therefore, Sipe (2000) found that students used illustrations and text-words together while comprehending texts during open discussion of a narrative storybook read aloud, however had difficulty making intertextual connections independently.

Working with second grade students, Rice and Rice (1981) wanted to investigate how the uses of illustrations in a narrative picture book affected the reader in terms of text comprehension. Rice and Rice described how 60 second grade students (elementary grade) aged seven and eight years old were randomly selected to participate in a study. The students all read the same narrative story, "What Will Little Bear Wear?" Half of the students read the story booklet independently with the illustrations, while the other students read the same story independently without the illustrations to determine meaning making capabilities of the students. After both groups read the story, they were all given a "comprehension questionnaire" (p. 309). The questionnaire referred to the text-words to measure text comprehension; the questions did not refer to any illustrations. Data analysis revealed that the students who read the version with illustrations had a "higher mean comprehension score" (p. 311) than the students who read the story version without the illustrations. Overall, researchers concluded that the "higher comprehension score" (p. 311) was a result of the participants being able to "read" the illustrations as well as the text-words and that combination added to their meaning making of the entire story. Therefore, Rice and Rice found that second grade students were able to increase in their comprehension of narrative texts when the narrative stories were accompanied with illustrations.

Norman (2011) also worked with second grade students (elementary grade). Norman wanted to explore students' cognitive processes in relation to graphics and text-words within informational texts. The study described how 30 second grade students responded after participating in this study. The 30 second grade students were asked to read two informational texts: *Weather Watching* and *Dino Dig.* While reading, the students were "prompted to think aloud" (p. 10) whenever they came upon an illustration which they "found interesting" (p. 10). In addition, participants were asked to share their thinking and explain in their own words the relationship between the graphic and the text-word information. After reading the two texts, the students were asked "book-specific" (p. 12) comprehension questions that referred to both the illustrations and the text-words within the texts. Comprehension questions were scored with a

maximum of 2 points each. Norman explained that participant "misconceptions" (p. 27) about certain illustrations may have altered the participants' thinking about the texts. Findings showed that some participants were not about to "effectively use reading processes when studying graphics" (p. 28). In other words, these grade two students appeared to have difficulty connecting graphics to text-words in order to increase text comprehension. Therefore visuals might "negatively affect" (p. 28) student's comprehension of expository texts. Overall, Norman found that the comprehension of pictures within an informational text did not assist students in the comprehension of the overall text.

Roberts, Norman and Cocco (2015) wanted to explore how "graphical device comprehension" (p. 396) impacts children's overall reading comprehension. Participants in their study were 156 third grade students (elementary grade): 62.2% were Caucasian, 16.7% were African American, 10.9% were Hispanic/Chicano, 5.1% Asian, and 4.5% did not report their ethnicity. In addition to ethnic diversity, participants' socio economic status (SES) was determined based on their mother's education level. All students were assessed individually using the Graphical Device Comprehension Assessment (GDCA) to determine reading comprehension of graphics (pictures); they were also assessed using the Group Reading Assessment and Diagnostic Evaluation (GRADE) to determine abilities in vocabulary, reading, comprehension, and listening comprehension. The GRADE passages did not include any illustrations. Lastly, participants were assessed using a Fluency Indicator Assessment (FIA) and an Elementary Reading Attitude Survey (ERAS). Analysis of the data found that all variables of diversity were "significantly correlated" (p. 408) with reading comprehension. Results indicated that 68.9% of the findings "correlated" (p. 408) to comprehension of graphical devices as well as text-words. The researchers concluded that "the ability to understand graphical devices also may contribute significantly to successful comprehension" (p. 416). Overall, findings suggested that inclusion and understanding of graphical devices could assist diverse third grade students with reading comprehension. Roberts, Norman, and Cocco found a correlation between the inclusion of pictures in a text and students using them to assist in the comprehension of a text.

Working with nine and ten year old students (elementary grade 4 and 5), Braid and Finch (2015) wanted to explore the question of how the illustrations in a narrative picture book altered responses during a whole class read aloud. Braid and Finch (2015) suggested, "picture books can be used to promote children's thinking" (p. 115). The narrative picture book read was *Luke's*

Way of Looking (Wheatley, 2001). Participants were 25 students in a New Zealand classroom who formed five groups of five. Each group was led by the classroom teacher during a "group read aloud session" (p. 116). The read aloud sessions were audio recorded and then analyzed to produce four categories, which the researchers used to identify what they called "types of thinking" (p. 118): define, combine, integrate, and expand. One emerging subcategory was "picture book elements" (p. 118) which contained the elements of words illustrations (including color, light, media, space, perspective, size, direction, composition, line, movement, object, symbol, shape, frame). Upon further analysis of the data, Braid and Finch found that 52% of the participants "combine' (link, order, organise)" (p. 118) the words and illustrations in a narrative text. Also, while reading the selected narrative texts, the participants continuously used the "linkages across the text" (p. 121) and pictures to assist in their comprehension. Overall, Braid and Finch found that illustrations "altered responses" because they enabled the participants to make links between the pictures and the text-words in order to increase comprehension and critical analysis of narrative picture books. Braid and Finch's study provides evidence that nine and ten year old students appear to use pictures to assist them in the comprehension of narrative texts.

Young (2012) conducted a study over the course of four months in a fifth-grade (elementary grade) classroom. The study assessed students' ability to interpret the meaning of different symbolic images in "historical fiction picture books" (p. 382) which covered the same topics the students were learning that year. The study was conducted in three phases. Phase I observed students' "literacy behaviors and responses" (p. 382) when interacting with the selected historical fiction picture books. During Phase II, "whole-class read alouds" (p. 382) were conducted and contained "purposeful demonstrations" (p. 382) so that the students became familiar with the use of illustrations, to assist in "meaning construction" (p. 382). Phase III contained "small-group discussions" (p. 382) in which all of the students were reading the same historical fiction picture book and were encouraged to "share ideas" (p. 382). Data were collected from students' responses about the historical fiction picture books using field notes, video and audio recordings, transcripts, class discussions, and weekly interviews with the teacher. Analysis revealed that 61% of the conversations were in regards to the illustrations within the picture books. Analysis also found that 25% of the conversations were in response to the text-words and illustrations together. Overall, Young found that most of the fifth grade

students used symbolic images to interpret meaning in historical fiction picture books; that is, the students "read images" (p. 391) to assist in the comprehension of historically based texts.

Multiple Grade and Age Students

Studies in this section compare participants across age and grade ranges to examine their use of images within texts. Jian (2015) compared how fourth grade students and university students read expository biology texts with illustrations. Jian conducted the study with 34 participants: 17 fourth-grade Taiwanese students, and 17 university students from the National Central University in Taiwan. To begin the study, the fourth grade students were administered the Reading Comprehension Screening Test to assess the students' "reading comprehension ability" (p. 6). Data analysis determined that all participants had "reading comprehension ability" (p. 6) above 90%. Participants were then assessed on a computer while their "eye fixations" (p. 7) were monitored. Both groups read "grade-appropriate texts" (p. 10). After reading the text, both the text-words and illustrations, all participants answered comprehension questions that addressed both the text-words and the illustrations. Data analysis revealed that the fourth grade students were "unable to link" (p. 13) information from text-words to the illustrations. The fourth grade students appeared to lack the "concept acquisition" (p. 13) that the university students had. Data analysis also found that the fourth grade students had a "larger proportion" (p. 10) of eye movements than university students when analyzing the illustrations within the text. However, the fourth grade students also "paid less visual attention" (p. 10) to one of the two illustrations. Overall, Jian concluded that while the university students "outperformed" (p. 13) the fourth grade students in reading and comprehending expository science materials, that performance may be because the university students had more years of experience reading expository science materials and therefore had greater prior knowledge of both the subject and the comprehension skill. However, as Jian pointed out based on eye movement, fourth grade students and university students have clear "developmental differences" (p. 3) for the reading and comprehension of pictures to assist them in comprehension of expository texts.

Pike, Barnes, and Barron (2010) explored how students in grades 2 through 6 could "bridge inferences" (p. 245) when connecting text-words with images in a narrative storybook and whether that "bridging" (p. 245) depended upon the age of the student. Students participating

within this study were 73 "native English-speaking" (p. 246) children (36 boys and 37 girls) ranging from grade 2 through 6 (or between the ages of 7 and 11 years old). Data were collected using a parent questionnaire distributed to the guardians, and from individual testing of the participants using the Sight Word Efficiency subtest from the Test of Word Reading Efficiency (TOWRE) the Picture Vocabulary subtest from the Woodcock-Johnson III, the Paragraph Reading subtest from TORC3-PR and the Bridging Inferences Test, Picture Version (Bridge-IT Picture Version). Data analysis indicated that illustrations "affect the inference making" (p. 253) of "younger readers" (p. 253) more than "older readers" (p. 253). Overall, Pike, Barnes, and Barron found that the grade 2 children use illustrations to assist them in meaning making, while the grade 6 children did not use the illustrations as heavily and were able to make meaning using just the text-words.

Moore and Scevak (1997) wanted to investigate differences between how students in primary and secondary schools process texts with visual aids in the content areas of history and science. Participants were 119 students from grades five (37 students), seven (40 students), and nine (42 students) in schools in New South Wales, Australia. All of the participants had an "average or above-average" (p. 209) reading ability as measured by GAP assessment administered prior to the study; participants in fifth grade wrote the GAP while participants in seventh and ninth grade wrote the GAPADOL (adolescent) assessment. The readings for the study for each grade level had a different main idea and theme; however, all texts included one visual aid with each history text having a table with "major text features" (p. 209), important dates, events, and outcomes. All participants were given history and science expository text to read and a set of multiple-choice questions to assess comprehension. Participants were permitted to take notes while reading the text, and had "allocated free recalls" (p. 210), that is, the students had an unlimited amount of time to look back at the readings in order to answer the questions. Data analysis found that the seventh and ninth grade participants appeared to have "greater metacognitive awareness" (p. 220) while using visual aids in the comprehension of history and science text-words than the fifth grade participants. This means that the seventh and ninth graders were more aware than the fifth graders of the ability of visuals to carry meaning related to the topic and content of the expository readings. Findings suggest that while students in fifth grade are able to make meaning of an expository text through the use of visual aids and text-words, fifth grade students are still developing their metacognitive abilities related to the

function of visual images in the comprehension of expository texts, especially in the content areas of history and science.

Unsworth and Macken-Horarik (2015) conducted a study, which involved 16 students from age 9 to 16 years old in a school in Melbourne, Australia. Unsworth and Macken-Horarik investigated how students comprehend using "visual resources" (p. 58) within a discussion as they progress in age. The students read two narrative story books titled: *The Great Bear* (Gleeson & Greder, 1999) and *The Tunnel* (Browne, 1989). The students were assessed at three-year intervals using their written responses to the same two picture books and were interviewed yearly regarding their responses on the narrative story books read. The questions for the written responses addressed "angles of illustrations" (p. 63) drawn within the narrative story books, addressed the lighting of the illustrations, the point of view drawn, and other literary elements. Students were asked to determine the author's and illustrator's "interpretive stances" (p. 66) as to the choices each made in creating the book and to provide "reasoning" (p. 66) for there determined stances. Data were collected from the students' written responses and from the yearly interviews. Analysis showed that when the students were interviewed at the age of 12, 6 students had the ability to make "semiotic responses" (p. 72), that is, the participants could explain why the author or illustrator may have chosen a certain color, point of view, or other element in order to produce a certain effect or carry certain meaning. However, a greater number of participants appeared to understand the reasoning behind the "authorial intentions" (p. 67) that is, why the author may have chosen certain words, and had gained "semiotic knowledge" (p. 67). Analysis of the interviews showed that students also appeared to understand "several aspects of interactive meaning making" (p. 75). Unsworth and Macken-Horarik concluded that as students increase in age, so too does their ability to comprehend illustrations increase. Findings suggest that the students in this study use pictures to assist them in the comprehension of the narrative texts read as they increase in age.

Summary of the Review

This literature review contains 16 research studies that pertain to the research question of how the comprehension of pictures develops and assists children to comprehend expository texts as the children progress through elementary school. The studies have been grouped into three major

sections implied in the research question. These sections are studies with elementary students ranging from Pre-Kindergarten to Kindergarten (3 studies), Elementary Grades One to Five (9 studies), and Multiple-Grades and Ages (4 studies).

Chapter 3: Methodology

To answer the research question, how does the comprehension of pictures develop and assist children to comprehend expository texts as the children progress through elementary school, a literature review was conducted. The data collection section below describes the process by which the research studies were found and organized. The data analysis section below explains the process of analysis, the determining of commonalities and patterns, and the resulting findings. The synthesis section within this chapter compiles the findings as a result of the data analysis and presents the results for this research study.

Data Collection

Data for this research synthesis consists of the 16 studies found through the data collection process of exhaustively searching the leading educational databases for peer-reviewed research studies. In an effort to determine the developmental nature of the interpretation of images and visuals, the studies were organized into three categories based on age of the participants: students in pre-kindergarten and kindergarten (3 studies), in grades 1 to 5 (9 studies), and studies with multiple participants in multiple grades (4 studies). These categories emerged from the research question and from an analysis of the preliminary data. These categories then served as the organizing structure for further data analysis, which is explained in the next section.

Data Analysis

All studies collected were analyzed within each category to determine commonalities and patterns within the data. The first category contains studies with participants five years old and younger. With only three studies for this category, generalizing some findings is difficult. However, analysis does produce a few findings about comprehension of visuals at this young age. First is that the understanding of words and images as “symbols” containing meaning beyond the “surface” lines and colors does not develop at the same time (Allen, Mattock, & Silva, 2014). Further is that understanding the concept of symbols does not appear to be related to the language development of a child (Allen, Mattock, & Silva, 2014). Another finding is that

by the age of late three years to five years old, children begin to think of words and pictures together as making a "text" -- a whole unit of meaning (Dooley, 2010). Related to education, research shows that direct instruction through art discussion about details in book illustrations appears to increase literacy development in young children (Hsiao, 2010). Overall, analysis of these studies indicates that the comprehension of pictures starts for young children with an understanding that images have a meaning in themselves and are not just a group of lines or squiggles, and that after this knowledge of symbols, children then begin to combine pictures and words to understand the concept of "text," where together the words and pictures have a meaning.

The second category contains nine studies within elementary school grades one to five that examine the use of pictures for assisting students in the comprehension of text. Although no studies of students in grade 1 could be found, three have been discovered that studied students in grade 2. A 1981 study finds that including pictures with a narrative story text increases student comprehension of the story (Rice & Rice, 1981), while 30 years later, a study using an expository science text has found that grade 2 students do not appear to make connections between the graphics and the text-words to enhance their content area meaning making (Norman, 2011). However, another study with narrative picture books shows that grade 2 students could read the pictures analytically when taught to do so (Sipe, 2000). Only one study in this category worked with grade 3 students; this study reveals that while the ability to understand graphical devices appears to contribute significantly to comprehension of a text as a whole, a student's ability to understand (make meaning from) a picture appears to correlate to the diversity of the student (Roberts, Norman & Cocco, 2015). One study with grade 4 students conducted in Australia finds that students can comprehend or make meaning from an almost "wordless" narrative story book (Mantei & Kervin, 2015). A 2009 study finds that students in grade 4 could comprehend a narrative text that included pictures independently (Swaggerty, 2009). A study involving grade 4 and 5 students done in a New Zealand classroom finds that with group lead discussions, students are able to understand the links between pictures and text-words (Braid & Finch, 2015). One study that focuses on grade 5 students discovers that while reading historical fiction texts, the students are able to determine the meaning of the text-words by using the illustrations included (Young, 2012). Overall, analysis of these studies indicates that by grade 2, having pictures in narrative texts helps students comprehend the text but students are not yet able

to use pictures in expository texts to increase their comprehension of the texts. By grade 4, children appear to have a very developed ability to comprehend pictures in narrative texts even narrative books with very few words. However, analysis also shows that no studies were conducted that specifically examined children's comprehension of pictures in expository texts.

The third category contains four studies examining the use of pictures with students of multi age and grade. With four studies for this category, generalizing some findings is difficult. However, analysis does produce findings about multi age and grade in the use of pictures to comprehend text. First, a 1997 study finds that students' metacognitive awareness in grades 7 and 9 are more developed than students in grades 5, and therefore grade 7 and 9 students are able to determine that visuals in content area expository texts carry a deeper meaning than just surface (Moore & Scevak, 1997). A study done 13 years later compared grade 2 and grade 6 students; the study finds that grade 2 students are more dependent on illustrations than grade 6 students. Therefore as students progress in age, their reliance on illustrations for comprehension of a narrative text as a whole appears to decrease (Pike, Barnes, & Barron, 2010). Another study had students read two narrative story books yearly ages of 9 to 16 years old; this study finds that as the students progress in age, their understanding of the story book illustrations moves from comprehension to critical analysis (Unsworth & Macken-Horarik, 2015). A study in Taiwan comparing grade 4 students to university students in their reading of expository science materials at their corresponding reading level; finds that university students have higher cognitive abilities than grade 4 students when analyzing two illustrations that when corresponding with the text-words (Jian, 2015). Overall, analysis of these studies indicates that the comprehension of pictures in texts does develop and change as the children age.

Synthesis

Two sets of findings emerge in this synthesis of the analysis results. The first set forms a continuum of the development of comprehension of pictures. The second set is teaching and instruction that help children develop their ability to comprehend pictures. In the first set of findings, the continuum starts with young children developing an understanding that images have a meaning in themselves and are not just a group of lines or squiggles. After this knowledge of symbols, children then begin to combine pictures and words to understand the concept of "text,"

where together the words and pictures have a meaning. Findings also show that this continuum begins independent of language development. By grade 2 along this continuum, children are able to use pictures in narrative texts to help them understand the story and can even become dependent on the pictures for the meaning of the text. However, they are not yet able to use pictures in expository texts to increase their comprehension of the texts. By grade 4, children appear to have a very developed ability to comprehend pictures in narrative texts even narrative books with very few words; however, by grade 6, children appear to become less dependent on the pictures for the meaning of a narrative. Therefore as children grow, their reliance on illustrations for comprehension of a narrative text as a whole appears to decrease, but their understanding of illustrations in narratives (pictures in storybooks) appears to move from comprehension to critical analysis. By grades 7 and 9 along this continuum, children are able to determine that visuals in content area expository texts carry a deeper meaning than just surface, and by the time children reach university level, their understanding of pictures in expository materials has progressed to a very analytical level. Overall, synthesis of these findings indicates that the comprehension of pictures in texts does develop and change as children age.

The second set of findings emerging in this synthesis of the analysis results is teaching and instruction that help children develop their ability to comprehend pictures. Related to education, analysis of research shows that direct instruction through art discussion about details in book illustrations appears to increase literacy development in young children. At the Pre-Kindergarten and Kindergarten age, to increase cognitive development in children, it is important to surround children with literacy materials including both pictures and text. Another finding is that in the elementary grades it appears to be important for children's of pictures to have open discussions both in groups and with teachers regarding illustrations within picture books in order to develop and assist in comprehension holistically. Also, in addition to group discussions, questionnaires appear to be a beneficial instructional method. The synthesis also indicates that as children move through elementary school, they begin to view illustrations independently and not rely on group discussions as heavily for making meaning from a picture. In addition, they appear to no longer need to rely on pictures to comprehend a text. Instead, as children advance in their education they do not appear to build on their comprehension through the use of pictures; their cognitive development has grown to a degree where pictures do not assist children in their comprehension. Instead pictures appear to become additions to their comprehension. With this

new knowledge, a professional development project will be implemented to instruct general teachers on how to implement the use of pictures to assist children in the comprehension of expository texts. This professional development project is detailed in the next chapter.

Chapter 4: Results and Application

Results of the Review

After completing a review of literature to determine what research says about how comprehension of pictures has developed and assists children to comprehend expository texts as they progress through elementary school, this researcher has determined two sets of findings from this synthesis. The first set shows a continuum of development of comprehension of pictures from early childhood to university. This continuum starts independently of language development and with young children developing an understanding that images have a meaning in themselves (are symbols) and that images and words combine to make a text. The continuum then continues through using pictures in narrative texts to help comprehend the narrative (story), but then the dependence on pictures to understand a story appears to decline by grade 6 to be replaced by the ability to comprehend pictures analytically and critically. The use of pictures to increase comprehension of expository texts appears to develop slowly but emerges in middle school as the understanding that visuals in content area texts do carry a content meaning. This understanding continues to develop so that by university, children comprehend pictures in expository material analytically and critically. The second set of findings is that teaching and instruction can help children develop along the comprehension continuum. Direct instruction through art discussion about book pictures appears to increase literacy development in young children, while elementary age children appear to benefit from group and teacher led discussions about comprehension of pictures.

Application of Results to Professional Development

The findings from this study have significance for elementary classroom teachers. Knowing these findings can assist teachers in knowing how to assist their students in the comprehension of visuals in expository texts. Sharing the knowledge from this research synthesis with elementary teachers is a form of professional development, and the most appropriate form for this professional development is a brochure. This form of professional development is best suited for elementary teachers because presents the information in a compact and quickly readable format and provides a resource that is easy to store and keep for future use.

Design of Professional Development Project

The design of this professional development project will be in the form of a brochure (see Appendix A) intended for elementary teachers. The brochure will be a trifold glossy paper with bold headings and colorful pictures and diagrams. However, a digital version will also be created for easier distribution to a wider audience and to keep the cost low. The information and instruction for the teachers that will be included will be bulleted and easy to read quickly, and also be supported by the findings from this research synthesis.

Literacy coaching project goals and objectives.

The goal of this professional development brochure is to inform elementary teachers about the existence of an age-related continuum for the comprehension of pictures by children. To address this goal, there are three learning objectives for the use of the professional development brochure. The first objective is that teachers who read the brochure will gain knowledge about the continuum for comprehension images (visuals). Second is that teachers will discover that the strategies of direct instruction and group discussion will help students build their comprehension of visuals skill. The third objective of this brochure is that elementary teachers will learn that analytical and critical comprehension of visuals can be taught to students but those skills are developmental, that is they occur at the upper elementary level of the continuum.

Proposed audience and location.

The audience for this proposed professional development project is elementary teachers of grades one to grade five. The advantage of a brochure for professional development is that teachers can choose their own location for reading the brochure. However, before reading the brochure, teachers must get it. Copies of the paper brochure will be sent to all elementary schools in the school district. The digital brochure will be posted on a Google Drive (or similar digital platform) and the URL will be made available to elementary school principals and school reading specialists who may then share it with their teachers, as they feel appropriate.

Proposed project format and activities.

The format of this proposed professional development project will be a trifold brochure. The brochure will include the findings to how important pictures are for students in the comprehension process. Inside of the brochure will include activities along with a "how to guide" for educators in which they can use to assist their students in the use of pictures to comprehend expository texts. On the back of the brochure the researcher's email address will be included for readers to post comments, questions, and evaluate the brochure.

Proposed resources for project.

The main resource for this project will be the brochure. Other resources are the email and contact information of the researcher. Also, other resources are the email and contact information of school principals, and the time required to distribute the paper brochure and set up electronic access to the digital version.

Proposed evaluation of project.

To evaluate the brochure created for this professional development project there will be a direct email address to the researcher on the back of the brochure (see Appendix B) which asks recipients to respond to its usefulness. With the emails received, the researcher will gauge whether or not the brochure was of use to the recipients or if the professional development should be revised for the future.

Project Ties to Professional Standards

This proposed form of professional development project ties to the following New York State Teaching Standards (NYSED, 2011): *Teaching Standard II: Knowledge of Content and Instructional Planning, Element II.2: Teachers understand how to connect concepts across disciplines, and engage learners in critical and innovative thinking and collaborative problem-solving related to real world context.* This standard aligns with the professional development

brochure because teachers who read the brochure will learn how to assist students to read visuals as a way to increase student comprehension of expository texts across disciplines. With this new knowledge in the brochure, teachers can help students make connections between text-words, pictures, and content area texts. Another New York State Standard that this proposed form of professional development ties to is *Teaching Standard VII: Professional Growth Element VII.2: Teachers set goals for, and engage in, ongoing professional development needed to continuously improve teaching competencies.* By reading this brochure, teachers are engaging in on-going professional development to improve their teaching competencies. Also, this professional development ties into the following International Literacy Association Standards (IRA, 2010): *Standard 6.3: Candidates participate in, design, facilitate, lead, and evaluate effective and differentiated professional development programs.* This standard directly aligns with the professional development brochure because it was designed and will be facilitated to and evaluated by elementary teachers.

Chapter 5: Discussion and Conclusion

Overview of Study and Findings

Although recent reading programs such as *Let's be Friends* by Houghton Mifflin (2001) and the Common Core Modules (Common, 2012) emphasize learning to read the words (the "print") and seem to ignore the reading of illustrations (the "visuals"), emergent readers first learn to "read" by reading visuals not words. Therefore early childhood educators should be aware of "image reading" when they are "considering the kinds of meaning making children do with books prior to conventional reading" (Lysaker & Hopper, 2015, p. 650). The problem related to this reading of visuals is teachers not understanding students' process for comprehension of images and that leads to the secondary problem of teachers not being able to assist students in the comprehension of complex texts which contain pictures, illustrations, and images. Both of these problems can be addressed by asking the research question of how the comprehension of pictures develops and assists children to comprehend expository texts as the children progress through elementary school. To address this research question, a research synthesize was conducted. The results show two sets of findings: that a developmental continuum appears to exist for the comprehension of visuals, and that there are some instructional strategies for enhancing comprehension along the continuum.

Significance of the Findings

These findings are significant to teachers because this new knowledge on how students use pictures to assist their comprehension of both narrative and expository texts as they progress through elementary school has the potential to assist reading teachers in their work. This study shows that students are capable of using pictures to assist them to comprehend text-words when taught how to do so. The integration of direct instruction and group discussions on the relationships of pictures with text-words can enhance comprehension of texts as a whole and also develop the skill of critical analysis of visuals. These findings are also significant to the field of literacy itself because they contribute new knowledge about the possible existence of a continuum for the development of comprehension of visuals.

Limitations of the Findings

The findings for this study do have limitations. One limitation is that the findings are derived from a synthesis of a very small number of existing research studies. Few studies have been conducted involving expository texts and pictures to assist students in comprehension, or student use of pictures to enhance comprehension. Many of the studies found used only narrative (story) texts. In addition, the majority of the research focused on students in grades two through five, only a few below grade one, a few including high school level and above, and no study was found involving students in grade one.

Conclusion: Answer to the Research Question

The research question for this research study is: how does the comprehension of pictures develop and assist children to comprehend expository texts as the children progress through elementary school? After conducting this study by performing a synthesis, this researcher determined that the results show two sets of findings: that a developmental continuum appears to exist for the comprehension of visuals, and that there are some instructional strategies for enhancing comprehension along the continuum. Examining these results produces this answer to the research question: the comprehension of pictures develops along a continuum of comprehension ability and focus, and a continuum also related to the type of text (narrative or expository) being read. This continuum as the children progress through elementary school and even into university, and teachers are able to use certain instructional strategies to assist children with their comprehension of both types of texts along the continuum.

Recommendations for Future Research

Because of the limited number of existing studies, the first recommendation for further research is that more research be conducted on how elementary school children use pictures to assist them in the comprehension of expository texts in content areas. Another recommendation is for increased studies in the United States; many studies that were found were conducted outside of the United States. However with the adoption of the Common Core State Standards (Common, 2012) in 41 out of the 50 states, it would be helpful for future research to take place within the United States.

References

Allen, M.L., Mattock, K., & Silva, M. (2014). Symbolic understanding of pictures and written words share a common source. *Journal of Cognition & Culture*. 14(3/4), 187-198. doi: 10.1163/15685373-12342120

Bishop, S.R., & Hickman, J. (1992). Four or fourteen or forty: Picture books are for everyone. In S. Benedict & L. Carlisle (Eds.), *Beyond words: Picture books for older readers and writers.* pp.1-10. Portsmouth, NH: Heinemann.

Braid, C., & Finch, B. (2015). "Ah, I know why...": Children developing understandings through engaging with a picture book. *The United Kingdom Literacy Associate, 49(*1), 115-122. doi:10.1111/lit.12057

Common Core State Standards (2012). *Preparing America's students for success.* Retrieved from http://www.corestandards.org

Cooper, J., & Pikulski, J. (2001). *Let's be friends.* Boston, MA: Houghton Mifflin.

Dooley, C.M. (2010). Children's approaches to books: The emergence of comprehension. *The Reading Teacher. 64*(2), 120-130.

Harste. J. (2014). The art of learning to be critically literate. *Language Arts. 9(2*2), 90-102. Retrieved from http://www.literacyinlearningexchange.org/sites/default/files/art-of-learning-to-be-literate-la2014.pdf

Hsiao, C.Y. (2010). Enhancing children's artistic and creative thinking and drawing performance through appreciating picture books. *The author journal compilation. 29(*2), 143-153. doi: 10.1111/j.1476-8070.2010.01642.x

International Reading Association. (2010). *Standards for reading professionals: A reference for the preparation of educators in the United States (revised 2010).* Newark, DE: IRA.

Jian, Y.C. (2015). Fourth graders' cognitive processes and learning strategies for reading illustrated biology texts: Eye movement measurements. *Reading Research Quarterly.* 51(1), 93-109. doi:10.1002/rrq.125

Kucer, S.B. (2014). *Dimensions of literacy: A conceptual base for the teaching of reading and writing in school settings*. (4th ed.). New York, NY: Routledge.

Lysaker, J., & Hopper, E. (2015). A kindergartner's emergent strategy use during wordless picture book reading. *The Reading Teacher. 66(*8), 649-657. doi: 10.1002/trtr.1352

Mantei, J., & Kervin, L. (2015). Examining the interpretations children share from their reading of an almost wordless picture book during independent reading time. *Australian Journal of Language and Literacy. 38*(3), 183-192.

Moore, P.J., & Scevak, J.J. (1997). Learning from texts and visual aids: A developmental perspective. *Journal of Research in Reading. 20*(3), 205-223.

Norman, R.R. (2012). Reading the graphics: What is the relationship between graphical reading processes and student comprehension? *Reading and Writing, 25*(3), 739–774. doi:10.1007/ s11145-011-9298-7

NYSED (2011). *The New York State teaching standards*. Retrieved from http://www.highered.nysed.gov/tcert/pdf/teachingstandards9122011.pdf

Pacific resources for education and learning (2013). Stages of reading development. *Reading Rockets.* Retrieved from http://www.readingrockets.org/article/stages-reading-development

Paris, A.H., & Paris, S.G. (2003). Assessing narrative comprehension in young children. *Reading Research Quarterly, 38(*1), 36-76. doi: 10.1598/RRQ.38.1.3

Pike, M.M., Barnes, M.A., Barron, R.W. (2010). The role of illustrations in children's inferential comprehension. *Journal of Experimental Child Psychology. 105*(1), 243-255. doi:10.1016/j.jecp.2009.10.006

Piper, W., & Long, L. (2005). *The little engine that could*. New York, NY: Philomel Books.

Rice, D., & Rice, R. (1981). Effects of pictures on reading comprehension, speed, and interest of second grade students. *Reading Improvement. 18*(4), 308-312.

Roberts, K.L., Norman, R.R., & Cocco, J. (2015). Relationship between graphical device comprehension and overall text comprehension for third-grade children. *Reading Psychology.36(*5), 389-420. doi: 10.1080/02702711.2013.865693

Sherman, C. (2011). Visualizing how we read. *The Dana Foundations.* Retrieved from http://dana.org/News/Details.aspx?id=43143

Sibanda, J., & Sibanda, L. (2013). Visual literacy development through the mediation of grade 4 English textbooks. *Journal of Visual Literacy. 32*(2), 39-66. doi: 10.1080/23796529.2013.11674709

Sipe, L. (2000). The construction of literary understanding by first and second graders in oral response to picture storybook read-alouds. *Reading Research Quarterly. 35(*2), 252-275. doi: 10.1598/RRQ.35.2.4

Swaggerty, E. (2009). "That just really knocks me out": Fourth grade students navigate postmodern picturebooks. *Journal of Language and Literacy Education. 5*(1), 9-31. Retrieved from http://jolle.coe.uga.edu/wp-content/uploads/2013/03/Swaggerty-E.pdf

Text. (2010). Merriam-Webster's Online Dictionary. Retrieved from http://www.merriam-webster.com/dictionary/text

Unsworth, L., & Macken-Horarik, M. (2015) Interpretive responses to images in picture books by primary and secondary school students: Exploring curriculum expectations of a 'visual grammatics'. *National Association for Teaching of English in Education. 49*(1), 56-79. doi: 10.1111/eie.12047

Villarreal, A., Minton, S., & Martinez, M. (2015). Children illustrators: Making meaning through visual art in picture books. *The Reading Teacher. 69(*3), 265-275. doi:10.1002/trtr.1405

Young, S. (2012). Understanding history through the visual images in historical fiction. *Language Arts. 89*(6), 379-395.

Appendix A: Format of Professional Development

Trifold Brochure

Cover: "How You Can Help Your Students Comprehend Texts With Pictures"

3 page centerfold:

First page: Picture and findings of research

Second page and third page: Activities with students

"How To" Guide

2 page back

How discussion and group activities improve comprehension

Last page: GoogleDrive URL and email with request for evaluation of brochure

Appendix B: Evaluation of Professional Development

An email address will be provided on the brochure

along with a request for comments, questions and evaluations.

A hyperlink will be provided on the GoogleDrive digital version of the brochure that

links directly to an email address for readers to provide and evaluation of the brochure.