

A Classroom Investigation of the Growth of Metacognitive Awareness in Kindergarten Children through the Writing Process

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This study investigated the presence and growth of kindergarten children's metacognition as they engaged in the writing process. The study was conducted in an environment that surrounded children with books, language, and print. Twice a month the teacher/researcher interviewed the children as they finished writing, asking questions designed to help them reflect on their thinking and strategies they used in their writing. Anecdotal records, observations, and individual writing folders were used to complete a checklist of writing strategies for each child. Interviews with the children confirmed that they were exhibiting and showing growth in their metacognition. They were able to provide appropriate answers to questions that required them to talk about their thinking and identify strategies that helped them in their writing. The study provides a model that could be used in classrooms to help children in the development of their growing metacognition and writing in an authentic learning environment.

KEY WORDS: metacognition; early literacy; writing; young children; kindergarten.

INTRODUCTION

In her research on reading and writing in young children, Yetta Goodman (1986) states that metacognitive and metalinguistic awareness are part of the very foundation of learning to be literate. However, there is still a great deal to learn about children's thinking and metacognition. This study was designed to investigate the metacognitive awareness and growth of 16 kindergarten children as they engaged in the writing process during their kindergarten classroom experience. The study also explored the growth in writing demonstrated by children in a classroom environment where they were encouraged to think about their thinking and the writing strategies they were using.

METACOGNITION IN THE LEARNING PROCESS

"Many cognitive researchers believe that the overall efficiency of the intellectual system depends upon megacognitive abilities, or 'knowing about knowing'" (Ferrari & Sternberg, 1998, p. 909). Although there are still many questions to be answered about children's metacognition, research has suggested that metacognition is an important element in the reading and writing processes (Fox, 2001). In reviewing the research, Perkins, Jay, and Tishman (1993a) state that metacognitive reflection and use of strategies does have the ability to empower students. They advocate teaching "the language of thinking" (p. 72) in order for children to develop a vocabulary to describe thinking (Perkins, Jay, & Tishman, 1993b), and state, "a rich language of thinking equips one for sophisticated metacognition" (p. 73). They believe that this language of thinking may also be transferred across learning domains. Therefore, teaching children in one setting, such as writing, may give students the ability to use this thinking in other subjects and settings as well. Olson and Astington (1993)

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elaborate on the concept of the language of thinking. They define talking about cognition as metacognitive talk and talking about language as metalinguistic talk. They state that this language could give learners a vocabulary for reflecting on their thoughts. Olson and Astington rate “think,” “know,” and “remember” as the most frequently used metacognitive terms.

John Flavell, one of the foremost authorities and seminal researchers in the field of metacognition (Ferrari & Sternberg, 1998) theorizes that metacognitive experiences that stimulate the child to do careful, conscious thinking can lead to the development of metacognitive knowledge in the child. Flavell (1979) indicates that there are two levels of children’s metacognition. One level is the acquisition of metacognitive knowledge. The other is the ability to produce it, which Flavell suggests develops gradually.

CHILDREN’S WRITING, THINKING, AND METACOGNITION

In the past three decades, there has been a shift from studying written products to studying the ways in which writers write and compose as well as the cognitive processes they go through to transform their thoughts to paper (Dyson, 1990; McGee & Richgels, 2000). Researchers have learned more about this process by having writers think aloud as they compose. Vygotsky (1978) recommended that meaningful writing should be conducted in a natural setting that cultivates writing development and advocated a kindergarten where children would be introduced to writing in a social setting that would encourage them to go just beyond their current capabilities and continue to grow and develop.

Research has shown that most kindergarten children use drawing, scribbling, and nonphonemic letter strings as they begin to write (Burns & Snow, 1999; Sulzby, 1996). Cambourne and Turbill (1987) suggest that most kindergarten children begin the year with a general, but vague, understanding that writing, reading, and language are somehow related. They propose that children need to gain a clear understanding of these connections. They maintain that children will develop strategies to use in their writing to serve as temporary scaffolds, which will drop away as they understand additional pieces of the writing/language puzzle.

Modern cognitive theory has contributed a great deal to the understanding of how people think and learn. Donald Graves (1994) finds that writing spurs many kinds of thinking. He states that “listening to our students helps us to see the inner mechanisms of their learning” (p. 18). Graves concludes that when children

speak, they are able to reveal how they approach and solve problems in their writing. He suggests that teachers encourage children to talk about these things by asking them a set of predictable questions.

Olson (1992) defines metacognition as thinking about thinking, consciously monitoring one’s own thinking processes. Olson refers to “thinking aloud” as a metacognitive activity and suggested that, with conscious practice, thinking aloud allows students to gain a greater understanding of their thinking during the writing process. In discussing ways to help children be more metacognitively aware, several other researchers have also suggested that teaching children to think aloud will help them be more aware of their cognitive processes (Spelling, Walls, & Hill, 2000).

ASSESSING CHILDREN’S WRITING

William Teale (1988) recommends that to have an accurate picture of children’s literacy development, assessment should include the areas of metalinguistic awareness and the writing strategies the students are using. He suggests that teachers learn about children’s strategies by asking children to write and then to read their writing. Teale recommends keeping a checklist to record writing strategies children use over the course of the year. Martinez and Teale (1987) developed the Writing Development Record designed to chart the type of writing and rereading children are doing. In their study of authentic assessment, Campione and Brown (1985) discuss the benefits of collecting rich, qualitative descriptions when studying children. They suggest using a “talk-aloud” approach, where the students talk about what they are thinking as they work. Portfolios, writing samples, observations, and checklists are methods of assessment in keeping with the developmentally appropriate practice called for by the National Association for the Education of Young Children and the International Reading Association (Neuman, Copple, & Bredekamp, 2000). As described in the following sections, this study used developmentally appropriate assessments in the data collection in order to collect the most valid data possible. It made use of checklists, collections of children’s work, and interviews of the children in authentic learning situations.

METHOD

The purpose of this study was to investigate the metacognitive awareness and growth of 16 kindergarten children as they engaged in the writing process during their kindergarten year. The study was also designed to

explore the growth in children's writing as demonstrated by children in a classroom environment where they were encouraged to think about their thinking and the writing strategies they were using.

Participants

The participants in this inquiry were the students in a kindergarten classroom at a small school, serving children from preschool through fifth grade. The students were primarily Caucasian, from low and middle socioeconomic backgrounds. One child in the classroom had considerable behavior problems, and another was diagnosed with learning disabilities. Three of the children were receiving help for speech and language difficulties. There were initially 15 children in the class; another student joined the class in January. There were six boys and 10 girls in the class.

Procedure

Classroom Environment

This investigation took place in the teacher/researcher's kindergarten classroom, which was in session five mornings a week during the school year. The room was set up in centers, or interest areas, where the children worked for at least an hour each morning. Before center time, the children spent approximately 30 minutes participating in a writers' workshop. The research was conducted during this workshop time, which began with the class sitting together in a circle on the carpet. The teacher would write on a large chart, beginning by asking one of the students to dictate something he or she would like to have the class write. The teacher encouraged the children to help with the writing and modeled "thinking aloud" with them to decide which letters, spacing, and punctuation would be needed.

Following the group writing time, the children were asked to go to the writing center where they picked up their individual writing folders and then selected a spot in the room where they would like to do their writing. They were encouraged to write about anything of their choosing. At the beginning of the year, this writing consisted primarily of drawing, progressing as the year went on to the addition of letters and short words. By the end of the study, some of the children were still primarily only writing short words, while others were beginning to write sentences and very simple stories. They used ideas from the group writing time, other environmental print from around the room, and completely original ideas. During this time, the teacher worked with individuals, asking them to read what they had written, and

provided help when requested or needed. As children finished their writing they met back in the circle to share their writing in the author's chair. Two or three children would have the opportunity to sit in the author's chair each day to read what they had written and call on their classmates to give them feedback, tell what they liked about the author's work, or ask questions.

Measurement Instruments and Techniques

This study used a qualitative approach. The primary means of data collection consisted of audio and video recording of interviews conducted with the students during writing time. Twice a month, when the students had finished their writing, the teacher/researcher asked each of the children individually to reflect on their writing by asking them a series of questions that were designed to stimulate their thinking about their thought processes: (a) Tell me what you were thinking about while you were writing. (b) Why do you think you thought about that? (c) How do you think that idea came into your mind? (d) How did you decide what to write about? (e) How did you figure out how to write down what you wanted to say? (f) How do you think your writing went today? Are you happy about it? Is there anything you'd like to do differently next time?

In addition to the audio and video recordings, other developmentally appropriate assessments were kept for each child, including a folder of the child's writing and a checklist of writing strategies. The writing strategies checklist that was developed by the researcher was based on the work of Cambourne and Turbill (1987), who outlined a series of strategies that young writers use. This checklist was filled out monthly on each child and was an effective overall record of which strategies the child employed each month. The Writing Development Record, developed by Martinez and Teale (1987) was used to assess each tape, and anecdotal records of observations made during writing time were also kept.

Data Analysis

The audio- and videotapes were transcribed and reviewed to document the children's responses to the questions asking them to think about their thinking. A table was made for each of the six interview questions. The table showed how many appropriate responses children gave, how many answers were "approximations" of appropriate answers, how many times children responded with "I don't know," and how many times they used a response that included references to the words "thinking," "thought," or "mind." The number of words children used in their responses was recorded as well as

the quality of their responses. Teale's Writing Development Record was used with each tape to assess the form of writing and rereading the children were employing and to show whether they attended to the print as they read. Each child's writing folder was reviewed at the end of the study, providing documentation of the development each child had made throughout the course of the year. The folder also provided additional data for each child's writing strategies checklist.

RESULTS

Interview Data

The heart of this study was a series of interviews conducted with each of the kindergarten children twice a month from October through March, after they finished their writing. At the end of each interview, children were asked to read the writing they had just completed. In going through the data, it became apparent that many of the children were using the words "thinking" and "thought" in their answers, words Olson and Astington (1993) called "metacognitive talk." The word "mind" also appeared regularly in their answers. These words were used in response to questions that contained these words, but also appeared in questions that did not. The use of these words was seen as an indication that the children were displaying metacognition and was indicated in the tables displaying the data. These words appeared in the children's answers 159 times in the first five questions. Words, such as "spell" and "write" appeared in answers the children gave to the later questions in which they were asked about their writing strategies and future plans. These words were seen as an indication of the children's metalinguistic awareness and were also indicated.

The first question, "Tell me what you were thinking about while you were writing," required only a basic reflection on what they were thinking. Even this, however, can be viewed as a metacognitive activity. Seven of the children responded to this with "I don't know" a total of 13 times from October to January, but by February and March all of the children were providing appropriate answers to the question without any additional prompting. Eddie's answers to this question over the course of the study provide a sample of the children's responses: "I was thinking about making balloons"; "I was thinking about writing a calendar"; "Um, mmm, being on a football field"; "Drawing a cake"; "Cats"; "I was thinking about, umm, stamps"; "Jets and rockets";

"Friends"; and finally, "I was thinking about making cannons."

Question 2, "Why do you think you thought about that?" required more complex thinking about their thinking. Fourteen of the children had some difficulty providing appropriate answers to this question over the course of the study, but by the end of March only one child responded with "I don't know." Seventy-five percent of the answers were considered to be appropriate, such as Amanda's responses, "Cause of *The Very Hungry Caterpillar* book"; "Cause it's almost Christmas"; and "Cause my brother knew how to draw 'em (mountains) and then I just copied off of him."

The third question, "How do you think that idea came into your mind?" seemed to require a higher level of metacognition. Most of the children had difficulty with this question at some point, but the frequency of "I don't know" answers decreased over time. Several children, including Bridget, began the study with a series of "I don't know" answers or approximations but by the end of the study were providing responses such as her March response, "Umm, because that when I listened to the story over there it made me think about that." There were 66 responses of "I don't know," but only nine of these occurred in February and six in March.

Question 4, "How did you decide what to write about?" seemed to be the most difficult for the children to answer. In October, only seven responses were considered to have adequately answered the question. Over the course of the study 42 of the 182 responses were considered appropriate responses. Angie's responses were typical of the wide range of responses that began with "Ghostis"; "Uhh, Thanksgiving"; "In my, well, balloon"; but by January progressed to "I thought there for a minute, then I thought Valentine's Day is coming up soon."

Question 5, "How did you know how to write down what you were thinking about?" indicated the children's awareness of the writing strategies they were using. Some early responses included: "Because I wanted to" and "Because I wanted to write an octopus, umbrella"; but by March only three answers were considered inadequate. There were 145 appropriate responses out of the possible 182, including Angie's response, "I copied it . . . from the bulletin board and the calendar and I knew how to spell some stuff."

The last question, "How do you think your writing went today? Are you happy about it? and "Is there anything you'd like to do differently next time?" provided the children with an opportunity to evaluate their writ-

ing. The responses showed that most of the children were pleased with their writing and thought they had done a good job. At the last interview, Emily responded that she thought she had done a good job, and when asked, "Is there anything you'd like to do differently next time?" responded, "I'll have to *think* about it."

Tables were made of each child's responses in order to display the number of words the child used to answer the questions each month and the number of words the child wrote during writing time on the days of the interviews. During the first interview in October, half of the children had not written any words at all. The average for the class was 1.6 words per child. By the last interview in March, everyone in the class was writing at least some words. The average number of words written when the last interview was conducted was 5.6 words per child.

Writing Strategies and Writing Development

In addition to the data provided by the interviews, the Writing Strategies Checklist was completed for each child every month to gain further insight into the strategies they used. Observation, anecdotal records, and the student's writing folder were used to complete the form. A table was created for each child to show which strategies they had used each month. A cumulative table was then developed to show a composite of the strategies used by the class over the course of the 6 months. The composite showed that the children's use of random letters decreased over the course of the year, as did their strategy of copying words that could be read but with no attempt at a storyline. Correspondingly, their ability to begin constructing storylines grew over time. None of the children were writing stories in October; one began in November, another in December. Six were creating storylines in January, seven in February, and finally nine in March. The children's use of temporary spelling also increased over the course of time, beginning with five students in October and ending with nine in March.

Another measure of the children's growth as writers was done by rating the videotapes with the help of the Writing Development Record. The data showed that, as a group, children gradually increased their use of conventional spelling. Only one child used conventional spelling in October, but 11 were using it in March. The same pattern appeared with their attempts at conventional rereading. Only two children reread their writing conventionally in their October interview, but that number increased to 14 in March. Possibly the best source of information about the growth in the children's writing

was each child's writing folder itself. This folder contained all the writing the children did during the classroom writing times and documented the tremendous growth the children made in their writing over the course of the year.

One of the interesting things that occurred in the classroom was the fact that the children began asking some of the interview questions to their classmates who were taking turns in the author's chair. For example, after a student author had read what she or he had written, a student might ask, "How did you decide what to write about today?" This was seen as an indication that the children were beginning to incorporate thinking about thinking into their daily thought processes without direct prompting.

DISCUSSION

The purpose of this study was to investigate the presence and growth of kindergarten children's metacognition through the writing process. The interviews with the children revealed that they were capable of thinking about their thinking; that they were exhibiting metacognition. They were able to provide appropriate answers to questions that required them to think about their thinking. One of the more interesting findings in the interview process was that the children used metacognitive terms to answer the questions. All of the children used the word "thinking" or "thought" at least once in their answers, and many used it repeatedly. Other terms that appeared frequently were "mind," "idea," "remembered," and "reminded."

The interview question, "How do you think that idea came into your mind?" seemed to require a higher level of metacognition. Most of the children had difficulty with this question at some point in the study, but the frequency of "I don't know" answers decreased over time. All of the children were able to give appropriate answers at least once during the year. The data appear to indicate that the higher level of metacognition required to answer this question may be something the children were learning over time.

The question, "How did you know how to write down what you were thinking about?" provided insight into the children's awareness of the writing strategies they were using. The question was designed to help them think about the writing strategies that were available to them so they could use them more consciously. The children had a much easier time with this question than with some of the others. They demonstrated a conscious awareness of these strategies, based on the ease

with which they were able to talk about the strategies they used.

Olson (1992) suggests that helping children consciously monitor their own thinking and writing processes through thinking aloud will help them understand their thinking and problem-solving processes more fully. Asking children to reflect on their writing provides a structured way to provide children with practice in this kind of monitoring and reflection. The interview process provided the teacher with an indication of the children's current ability to answer questions about their thinking. This allowed her to have insight into what Vygotsky (1978) described as the children's zone of proximal development and, therefore, scaffold their further growth. The checklists, anecdotal records, and writing collections provided information about the children's writing levels and allowed for similar help in prompting them to the next stage in their writing.

Through the interviews and observations, a great deal of information was gathered that provided evidence that kindergarten children are capable of metacognitive thought. The quality of their answers appeared to grow over time. This may be due to many factors, including language growth, acquisition of the vocabulary needed to answer the questions, a natural maturational process, and a growth in children's metacognition. The fact that many children were able to produce appropriate answers to many of the questions from the beginning of the study lends evidence to the fact that their answers were not simply trained by taking part in the study.

Flavell (1979) theorizes that metacognitive experiences—or those experiences that stimulate a child to do careful, conscious thinking—would lead to the growth of metacognitive knowledge in the child. The interviews provided children with these experiences. The children did seem to engage in conscious thinking to answer the questions. The interviews may have led to the growth of metacognition in these children. The questions did seem to be able to prompt the children to think about their thinking. This may be another indication that these kindergarten children are not only capable of metacognitive thought, but that they are also able to produce it when cued. Graves (1994) suggests that asking children a set of predictable questions could help children give well thought out answers. This study appears to substantiate this belief as the questions seemed to promote metacognitive thought in the children. The children responded well to being asked predictable questions each session.

Based on her review of the research, Ellen Gagné (1985) suggests that it is metacognitive awareness that allows learners to have knowledge about the strategies they are using. The children's ability to discuss the writ-

ing strategies they used may provide additional evidence of their metacognition. This study was designed to help the students become more aware of the strategies they were using, so they could use them more consciously and, therefore, more effectively. Conferencing with the children and asking them to think about the strategies they were using gave them experience in doing this. Emily's responses at the beginning and end of the study illustrate the growth observed in the children. In October when asked how she knew how to write down what she wanted to say, she replied, "Sometimes I looked at letters that I didn't know how to spell, so I just mixed them up to spell words that didn't mean anything," which was very descriptive of her writing at that point. In March her response, "I used my dictionary . . . my mind, and sounding out," demonstrated an awareness of the writing strategies she was using as well as an awareness of her thinking. Her writing had also advanced from writing random letters to writing many words conventionally, having the confidence to use temporary spelling for words she did not know, and using the words to construct simple storylines. Growth in both the children's thinking and their writing was seen in all the children. The children's writing showed a definite growth in both quantity and quality. Children began by expressing themselves primarily through drawing and then progressed to copying words from the environment. By the end of the study, many of the children had developed sufficiently in their writing to begin to write simple stories on their own.

Using the setting of the writers' workshop seemed to provide a meaningful and natural environment in which to nurture metacognitive thought in the children. Olson and Astington (1993) recommend that 5- and 6-year-olds be encouraged to think about their thinking, and that this be done in context, rather than as a separate subject itself. This study provides a model teachers can use to help children develop and use their metacognition, as well as grow in their writing and literacy development in a writers' workshop setting.

One of the most exciting outcomes of this study is the indication that it is possible to promote the development of the vocabulary needed by 5- and 6-year-olds to begin talking about their thinking. The number of references the children made to words such as "thinking," "mind," "idea," and "remembered" demonstrates that the children were acquiring what Perkins, Jay, and Tishman (1993b) refer to as the language of thinking. This language may help children in both the expression and conceptualization they need to build greater metacognition. This increased consciousness of their thinking may then enable them to learn more effectively.

The Child's Theory of Mind research (Flavell & Miller, 1998) currently being conducted is continuing to add to our knowledge in this area. It has also added new questions to our beliefs about children's metacognition and thinking. Continued research is needed to help us understand how children think, learn and acquire the literacy skills they need.

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