Nurturing reading comprehension of attention deficit students by improving their inferential skills

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Abstract
Inference-making is a necessary component of reading comprehension. Many attention deficit students have shown some degree of reading comprehension deficiencies. Due to the nature of their disability – staying focused, sticking to a task, and noticing details – inference-making may be difficult for them.

This article suggests that by modifying and enhancing existing teaching methods and strategies, the instructional needs of ADD/ADHD students would be met. It offers some lesson and teaching modifications that have shown to be helpful in this author’s experience.

When teachers are aware of the characteristics and limitations of students with an attention deficiency, they can make the modifications in their lessons and teaching methods meet the educational and instructional needs of these students. These students can then master the inference-making skills needed to improve their reading comprehension.
Nurturing Reading Comprehension of Attention Deficit Students
by Improving Their Inferential Skills

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Abstract

Inference-making is a necessary component of reading comprehension. It has been defined as the process of using background knowledge and applying it to the text. When using inference-making skills students are able to combine their background knowledge with the clues given in the text and deduce what was the author’s unstated intent. Through recent research it has been determined that the inference-making skills can and should be taught to all, even the young, emergent reader. Teachers are not to assume that inference-making just happens.

Many attention deficit students have shown some degree of reading comprehension deficiencies. Due to the nature of their disability: staying focused, sticking to the task, and noticing details, inference-making may be difficult for them. Applying inference-making skills is noticing the clues the author presented in the text and/or illustrations. Due to the fact that those with attention deficits often miss these clues, because they fail to notice the “details”, their reading comprehension is incomplete.

This article suggests that by modifying and enhancing existing teaching methods and strategies the instructional needs of ADD/ADHD students would be met. It offers some lesson and teaching modifications that has shown to be helpful in this author’s experience when working with ADD/ADHD students in her classroom. Using such visual aids such as color coding and graphs and charts helps the ADD/ADHD student stay focused. The inability to stay on task and remain focused for an extended amount of time is one of the main characteristic of this disability so lesson material needs to be divided into small, manageable pieces. Also, ADD/ADHD students do not have the ability to work for long range goals or rewards so immediate feedback is essential.
When teachers are aware of the characteristics and limitations of students with an attention deficiency, they can make the modifications in their lessons and teaching methods meet the educational and instructional needs of these students. These students can then master the inference-making skills needed to improve their reading comprehension.
Nurturing Reading Comprehension of Attention Deficit Students by Improving Their Inferential Skills.

Inference-making is fundamental to reading comprehension. Making an inference has been defined as, "the process of deriving meaning by integrating textual or visual clues with one's prior knowledge" (Johnson, Johnson, Harms, & Lettow, 1997). It has also been stated that, "inferences are conclusions based on evidence found in the text. Inferences in reading are interpretations or conclusions about word meanings, phrase and sentence meanings and author's intentions" (Phillips, 1992).

Inferencing is an interchange of text information and prior knowledge (Barns, Dennis, & Haefele-Kalvaitis, 1996). Even though the aforementioned researchers have different ways of saying the same thing about what inferences are, they do agree that inference skills are an essential part of the reading process. Without these skills there can be no cognitive understanding (Medo & Ryder, 1996).

Many students that have been diagnosed with an attention deficit disorder, often referred to as ADD/ADHD, have difficulty with reading comprehension. The students' inability to stay focused and to stay on task often impedes their ability to comprehend what they have read. They often miss the inferences that are found within the text and/or illustrations of what they are reading, thus their comprehension of what they have just read is incomplete (Barkley, 1990).

Inferential Comprehension

During the past 20 years a great deal of research has focused on the process of inference-making. The consensus was that students had difficulty making inferences while reading (Phillips, 1992). What was the rationale for
It was a common belief among many educators that young children did not possess the level of thinking skills that enabled them to make inferences while reading. Due to the efforts of many researchers during the past two decades, this belief was found to be inaccurate (Danner & Mathews, 1980; Hansen & Hubbard, 1984; McIntosh, 1985). These studies concluded that even though young children had the mental capacity and memory ability to make inferences they do not do it spontaneously.

Prior to the whole-language approach of reading instruction, reading instruction was centered around a basal directed reading program. These programs approached reading instruction on a skill based method. Different skills were thought of as pieces of a big puzzle. If skills such as building site vocabulary, developing phonetic skills, using context clues, learning prefixes and suffixes and their meanings, learning small words and building on them to form more complex words, using picture clues, etc. were mastered, than reading comprehension would occur. In a skill based curriculum inference-making was taught as just another skill (Phillips, 1992).

Often, when the inference-making “skill” was taught in isolation there was little carry-over to other genre. Students did not realize that this “skill” was to be applied whenever and whatever they read. Many students did not understand that when creating an inference, they were to apply their prior, or background knowledge to the textual material to form an inference that the author intended the reader to develop (Holms, 1987).

Questioning has been and still is a big part of reading instruction. Usually after a piece of literature has been read by the student, the teacher will use questioning as a form of assessment to see if the student comprehended what was read. Unfortunately, most of the questions asked seek literal
information and not inferential information. This was particularly true if the questions asked were generated by the basal series. One of the main weaknesses of basal based reading programs was that they lack good inferential questions (Phillips, 1996).

Whether a teacher uses a basal based reading program, the whole-language approach reading program, or a combination of the two, asking good inferential questions is essential to developing inference-making abilities. "The Barrett Taxonomy Cognitive and Affective Dimension of Reading Comprehension" is an excellent reference for ideas and examples of inferential questions that will promote inferential comprehension (Barrett, T., 1972). (see Appendix A)

Hanson and Pearson, (1983) examined the instruction of reading comprehension, as it pertains to inferences. Practices in the past have been in the form of asking questions that lead to an inference about difficult passages, or about the selection as a whole. They found that students did not know they were to make inferences while they were reading. Teachers should not take for granted that students know how to recognize and apply inferences in the reading process. Students need instruction in specific inferential strategies this is especially true of students that are attention deficit.

**Attention Deficit Disorder**

The two most common questions asked about ADD/ADHD is, what is Attention Deficit Disorder/Attention Deficit Hyperactivity Disorder, and what causes it? At one time ADD/ADHD was thought to be a medical condition and then it was considered to be an emotional disturbance. Also, at one time it was considered to be a form of mental retardation (Reese, 1993).

Before 1940, in the United States, children with learning difficulties were
considered to be mentally retarded, emotionally disturbed, or socially and culturally disadvantaged. In the early 1940's a fourth possible cause was discussed by researchers as neurological based. At first, brain damage was thought to be the cause. Later, the focus was on the way the brain functioned. All of the mechanisms seemed to be there and operational; “however, some of the wiring did not function the way it should” (Silver 1991). At this time the term Minimal Brain Dysfunction was introduced.

The term ADD/ADHD is the current descriptive diagnostic term in the revised third edition of the American Psychiatric Association’s Diagnostic and Statistical Manual (1987). Even though the terms ADD, attention deficit disorder, and ADHD, attention deficit hyperactivity disorder, are often used interchangeably they are not the same disorder. Some of the characteristics are similar but in reality they are at opposite ends of the spectrum.

A child with ADD is not generally disruptive in the classroom and their behaviors are not necessarily annoying or noticeable to those who associate with them. However, ADD can be very problematic to those who have it. It can cause the child to underachieve in many of their endeavors. These students often experience low self-esteem because they see themselves as failures. Barkley, 1995, MacQueen, 1991, and Parker, 1992, have identified the following as the behavioral characteristics of ADD:

* Easily distracted by extraneous stimuli
* Difficulty listening and following directions
* Difficulty focusing and sustaining attention
* Difficulty concentrating and attending to task
* Inconsistent performances in school work
* Tunes out, may appear “spacey”, often referred to as an “air head”
* Disorganized--- often loses/can't find belongings: desk and room in a constant state of disarray

* Poor study habits and study skills

* Difficulty working independently

The students that are ADHD are disruptive in the classroom. Unlike the student with ADD, who are often unnoticed because of the nature of their disorder, the students with ADHD are usually noticed first. They are the “squeaky wheels” in the classroom. Barkley, 1995; Hunt, 1993; Kajander, 1996; have identified the following behavioral characteristics of ADHD:

* High activity level
  - Appears to be in constant motion
  - Often fidgets with hands or feet
  - Finds nearby objects to play with or to put in mouth
  - Roams around classroom, has great difficulty remaining seated

* Impulsivity and lack of self-control
  - Blurs out verbally, often inappropriately
  - Can not wait for his/her turn
  - Often interrupts or intrudes on others
  - Often talks excessively
  - Gets in trouble because he/she does not “stop to think” before acting or reacting
  - Often engages in physically dangerous activities without considering the consequences

* Difficulty with transitions/changes activities

* Aggressive behavior, easily overstimulated
* Low self-esteem
* High frustration level

These students often feel picked-on by adults because they are the students that seem to be, and often are, reprimanded much more often than the other students.

The exact cause or causes of ADD/ADHD are not conclusively known. Scientific evidence suggest that in many cases the disorder is genetically transmitted and is caused by an imbalance or deficiency in certain chemicals that regulate the efficiency with which the brain controls behavior. In 1990 the National Institute of Mental Health conducted a study to either support or refute the evidence that ADHD was a result of a chemical imbalance in the brain. The results of their study was that those with ADD/ADHD had a series of metabolic abnormalities in the brain, providing further evidence that ADD/ADHD is a neurobiological disorder.

Many doctors describe ADD/ADHD as a neurological inefficiency in the area of the brain which controls impulses and aids in screening sensory input and focusing attention. They say there may be an imbalance or lack of the chemical dopamine which transmits neurosensory messages. Doctors claim that when we concentrate, our brain releases extra neurotransmitters, which enable us to focus on one thing and block out competing stimuli. People with ADD/ADHD seem to have a shortage of these neurotransmitters (MacQueen, 1991).

Heredity is often indicated as a factor with ADD/ADHD. A child with ADD/ADHD will frequently have a parent, sibling, grandparent, or other family member who had similar school histories and behavior patterns during their childhood and in some cases into their adulthood (Parker, 1992).
Other possible causes for ADD/ADHD have also been indicated and are subject to further study. They are problems in prenatal development, birth complications, lead poisoning, or later neurological damage. There is little scientific evidence that environment or diets that contain sugar, white flour, additives, or food dyes cause attention deficiencies. (Barkley, 1995).

Children identified as having attention deficit disorder are found at all age groups, in all races, and at all incomes levels. They are truly a heterogeneous group of youngsters. In 1994 the United States Department of Education estimated that approximately 3%-5% of school-aged youngsters have an attention deficit disorder. However, this is very likely an underestimation due to the fact that many ADD girls go undiagnosed. ADHD is far more common in boys than girls. Hyperactivity affects at least two million children in the United States alone. (Barkley, 1994).

Often it is the teacher who first notices some of the behaviors that indicate a child might be attention deficit. Typical behavior characteristics displayed by children with attention deficit behavior such as inattention, hyperactivity and impulsivity, if left unchecked, can lead to many problems in the classroom. Students with ADD/ADHD have difficulties completing their work, staying on task, organizing their personal belongings and school work, and completing independent work. They also display immature behavior, lack social skills, and often have difficulties with peer relationships. A number of children with attention deficit disorder are also noncompliant and display behavioral problems in the school setting. At times some of these students behave aggressively toward peers and teachers. In addition to the aforementioned characteristics ADD/ADHD students often have poor fine motor skills, do not attend to details, and often times lack the ability to apply the higher order
thinking skills needed to complete a task (United States Department of Education, 1994).

**Recommended Procedures**

In order to meet the educational needs of children with ADD/ADHD, teachers need to make adaptations in class management, lesson presentations, work assignments, test-taking methods, and physical layout of the classroom. Children with ADD/ADHD need to be in a structured classroom where expectations and rules are clearly communicated to them and where academic tasks are carefully designed. Most students with ADD/ADHD need preferential seating. They need to be close to the teacher and they need to be placed where there are as few distractions as possible (Barkley, 1994) and (Kajander, 1996). Interactive teaching strategies are needed to keep these students on task. Since most of these adaptations are basic principles of effective teaching, all students in the classroom will benefit.

The United States Department of Education (1994), based on their studies, recommended the following teaching strategies to meet the needs of a child with attention deficit:

* Keep lesson objective clear.
* Deliver the lesson at a brisk pace.
* Use co-operative learning as much as possible.
* Use meaningful materials and manipulatives.
* Have the students recite in unison.
* Use a minimum amount of materials during lessons.
* Prompt for student answers after allowing at least five seconds of wait time.
* Use an assignment booklet where the student writes down assignments.

Woods (1991) and MacQueen (1991) have identified other tactics that teachers...
have used to help students focus in on the task at hand include the following:

* Use color coding or highlighting to help focus attention on critical information contained in assignments.
* Give the students an overview of the lesson and then "chunk" the lesson into several small sections. Then review the entire lesson again (whole-part-whole).
* Give single, clear directions both orally and visually. Whenever possible, provide the student with a model of what he or she should be doing.
* Set up consistent routines for making the transition between lessons, getting and putting away materials, and asking for assistance.

The author of this article addresses various methods and strategies that will aid in teaching inferential comprehension to students who have been diagnosed as ADD/ADHD. While they are specifically designed for ADD/ADHD students, the reader will find them useful in most classroom settings.

The studies conducted by Johnson and Johnson (1986) are beneficial when teaching inferences skills to ADD/ADHD students. Johnson et al. (1997) not only address the inference skills found in the text but also direct the reader's attention to the inferences found in the illustrations in the book. This combined approach is particularly useful for the ADD/ADHD students. Because many of them are visual learners, directing their attention to a visual, the illustrations, helps them to focus. (Barkley, 1997)

If teachers initially presented experiences with picture books when teaching inferences, one of the main problems of ADD/ADHD children would be avoided, that of sustained attention to task. Picture books offer a whole story that can be read within a short period of time. Readers are more likely to understand and remember such a short story. Also, laps of short-term memory,
pieces of information (Weiner 1990). Johnson and Johnson (1989) identified nine texts and illustration inference tasks. A tenth type (i.e., figurative language) was added at a later time (Johnson, et al., 1997).

The ten different kinds of inferences are:

1. **Action**: What is Happening?
2. **Location**: Where does this take place?
3. **Time**: When does this take place?
4. **Characterization**: What are some of the traits of the character? Who is being described here?
5. **Object**: What thing is being described?
6. **Category**: To which group do these people, objects, actions belong?
7. **Cause/Effect**: What caused the situation? What will be the effect of the situation?
8. **Problem/Solution**: What should be done to solve this problem?
9. **Feelings/Attitudes**: What feelings of attitudes does a character have?
10. **Figurative Language**: What is the intended meaning of the figurative expression?

It has been recommended that large tasks be divided into small pieces for the ADD/ADHD student so that they would not feel overwhelmed (Barkley, 1997, MacQueen, 1991, Weiner, 1990). By using Johnson and Johnsons' ten types of inferences, the instructor can easily focus on one type at a time.

**Strategy One**

This author has had the opportunity of working with several ADD/ADHD students in her 5th grade classroom. She has found through observation and formal evaluations, that ADD/ADHD students were able to comprehend inference-making better when a number of different teaching strategies were
The first teaching strategies used was a combination of Johnson and Johnson's ten inference types, the use of charts and graphic organizers, color coding, and the use of a "Search Chart" (see Appendix B). The inference types would be listed in a vertical column. Then, the teacher could either place a different colored symbol by each inference type or underline each inference type with a different color. The following are three examples of how one might color code the ten inference types on the displayed chart.

- Cause/Effect or Cause/Effect
  
- Location or Location
  
- Characterization or Characterization

Color coding or highlighting would help ADD/ADHD students focus attention on one inference type at a time (Weiner, 1991). The use of a chart would be the visual aide and graphic organizer needed by the ADD/ADHD student (The A.D.D. Vocate, 1994).

When instruction in inference-making was introduced, this teacher read the picture book, Someday a Tree, by Eve Bunting, 1993, aloud to her class. This book was chosen because of its potential for inference-making. After reading, this instructor displayed the chart that showed the ten types of inferences which had a different colored star in front of each inference type. The class was informed that the inference lesson for the day would be on the cause/effect inference type, which had a yellow star in front of it. A mini lesson on cause/effect was given so that this teacher felt that each of the students knew what cause/effect was and that they would recognize it when they read it in the text.
Using the overhead projector, an example of the “Search Chart” was displayed. Instructions were given as to how to use it when searching for examples of cause/effect in the text and/or illustrations of the book. Each student was given a yellow “Search Chart”. The class was then divided into groups of two. Each group had a copy of *Someday a Tree*. Each pair of students were to begin by reading the first page of the story. Then they were to look for examples of cause/effect, either in the text or in the illustration. If an example was found they were to first, write the page number in the “page number column”, second, if an example of cause/effect was found in the text they were to write it in the “text example” column, and third, if an example of cause/effect was in the illustrations of that page, the students were to write the example down. The class was to continue until the entire book was completed.

It was explained to the class that not all the students would find the same examples nor did they have to agree on the examples found by other students. This was because inference-making is “the process of deriving meaning by integrating textual or visual clues with one’s prior knowledge” (Johnson, Johnson, Harms, & Letlow, 1997). Students do not have the same prior knowledge, thus what one student considered to be an inference another student may not. However, by working in pairs and sharing and comparing the inferences they found, each student had the opportunity of getting different points of view.

The following is an example of the process that the students used in this activity. First, the students read a page from *Someday a Tree* by Eve Bunting. (no page number identified)

“But the rain doesn’t help.
Every day that yellow stain spreads. The grass around the tree is
withering.

We peer up into the leaves. They are dry and dull and drift down on our upturned faces. It's only spring, but the leaves are falling.

Mom put her hand on the trunk as though checking for fever.

Dad kicks at the stiff grass.

'It's as if something was spilled here,' he says. 'I think we need to call a tree doctor.'

When the tree doctor comes, she crumples one of the fallen leaves and scoops a sample of the dirt from around the trunk.

'Is the tree sick?' I whisper.

She touches my cheek. 'I need to run some tests before I'll know for sure. Keep thinking good thoughts, honey.'

Then the students began to filling out their yellow cause/effect "Search Chart". The following is how one pair of students completed the task:

<table>
<thead>
<tr>
<th>Page Number</th>
<th>Text Example</th>
<th>Illustration Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>The tree was sick because because someone spilled something poison by the tree.</td>
<td>The little girl is sad her tree was sick.</td>
</tr>
</tbody>
</table>

After each pair of students shared and compared the inferences they found, they were joined by another pair of students. The four students then shared and compared the inferences.

The ADD/ADHD students were very successful due to the fact that they were directed to focus on one inference type, they used visual aides and graphic organizers, the important information was color coded, they worked in small groups, and their opinions were valued.

When the students demonstrated a high level of competence, determined through teacher observation and by standardized test scores, this teacher introduced an expanded form of the same teaching strategy. The inference type
chart was still displayed and referred to often. However, photocopied articles from age appropriate magazines replaced the picture books. Some of the magazines used were, Ranger Rick, Highlights for Children, The Children's Friend, and Boys' Life. The students filled out their "Search Charts" the same way as they had when using picture books. This time they did not have to find inferences in the illustrations because most of the illustrations that accompanied the magazine articles were very limited.

**Strategy Two**

The second teaching strategy this teacher used to help ADD/ADHD students master inferences-making skills was that of reinforcing skills with the use of a student workbook. Using the workbook made immediate feedback possible. Students with attention problems need immediate positive feedback or reinforcement for a job well done. Students with attention/impulsivity difficulties often can not work successfully toward long-term rewards, no matter how appealing the incentive (Rief, 1995).

The format used in the workbook series, *Comprehension & Reasoning* by Johnson and von Hoff Johnson (1989) fulfilled the needs of the ADD/ADHD student. Each lesson was divided into three sections: Introduction, Practice, and Extension. Each lesson in the teacher's edition began with directions and helpful suggestions for the teacher. In lesson 1 of Level 5, the authors instructed the teacher that it was not essential for the students to know the specific types of inferences in order to improve their inference-making skills, but by using the proper terminology their awareness level of the different types of inferences would increase. The introduction of lesson 1 began with a set of directions given to the student. The students were to read the paragraph and then make an inference to answer the question that followed the paragraph. The
students were to use the color clue words found in the paragraph to help them with the task. Three possible answers were offered to the students, but only one was the correct answer. To further aide the student, an illustration of each of the three possible answers was included.

The following is the introduction portion of lesson 1 of level 5 in the workbook series (p. 1). It will illustrate the authors' use of using color coded words as a way of emphasizing the important information.

"Alexander Graham Bell taught deaf students. He also devoted his time to an invention that is in nearly every home and business today. In 1876, Bell was working on his invention when he accidentally spilled something on himself. He called to his assistant who was in a different room. The words, 'Mr. Watson, come here, I want you,' were sent through the invention.

Which object did Bell and Watson invent?

light bulb

telephone"

The second section of each lesson, Practice, contains six brief paragraphs, each dealing with a different subject. Following each paragraph was one question and three possible answers. The students had to use their inference-making skills in order to choose the correct answer.

The third section of each lesson, Extension, gave the students an opportunity to write their own paragraph. They chose from three possible categories. Each categories had two topics to choose from. The students were told to write a paragraph about their topic without naming it. They had to use clue words so that the reader would have to use their inference-making skills to guess the correct topic.

This teacher found that this workbook series met many of the educational needs of her ADD/ADHD students. By dividing each lesson into three sections,
the ADD/ADHD students were able to maintain their attention to task with less effort than they would have had if the lesson been long. The use of color coding helped the ADD/ADHD student focus on the important information. The choice of three correct answers was very useful because it gave the students only a few choices to choose from. The accompanying illustration offered the visual aide that the attention deficit student needed.

**Strategy Three**

The third teaching strategy this teacher used when she taught inference-making skills to her ADD/ADHD students followed the pattern developed by Winne, Graham, and Proch (1993) while they conducted a research study. The hypothesis of their study was that poor readers would improve their text-based inference-making skills if they had to justify their inference by finding evidence in the text that supported their inference.

The researchers used two groups of twenty-four students. Group one consisted of third grade students and group two consisted of fifth grade students. The students in each group were identified as poor readers through their performance in their classrooms and by the results of their standardized tests scores.

When the researchers were confident that the students had a working knowledge of the inference-making process and were able to apply that knowledge to appropriate reading material, they introduced the terminology that was used in the study. The "inference question" was called the question that, "you had to figure out". The "critical facts" were the bits of information the students had to look for that told them "how you figure out the answer".

The study was designed so that each student worked with one teacher or tutor. The teacher or tutor read a brief passage aloud from appropriate level text
while the student followed along on a copy of the text, line by line. The student’s copy of the text was removed and the teacher or tutor asked comprehension questions what required the student to use inference-making skills. The student’s oral answers were recorded. The student was given his/her copy of the text back. The teacher or tutor repeated the inference question, repeated the student’s answer and then asked the student to underline phrases in the passage that helped the student “figure out” the answer to the question. The student used a colored pencil to underline the “critical fact” that justified his/her answer. If the answer and justification was correct the student was praised for a job well done. If the answer and/or justification was incorrect the teacher or tutor helped the student find the correct answer and/or “critical fact”.

The post study evaluations indicated that the students did improve their text-base inference-making skills. The researchers concluded that giving immediate positive feedback was a contributing factor for the improved evaluation scores.

This teacher believed that by using the same format as the study conducted by Winne, et al (1993) her ADD/ADHD students would improve their inference-making skills. The design of the study met many of the educational needs of the ADD/ADHD students. The one-on-one teacher-pupil ratio was ideal for the ADD/ADHD student (MacQueen, 1991), and the passages were brief which helped the student remain focused (Barkley, 1997). Using colored pencils to underline their “critical fact” helped them to focus on the important information (Weiner, 1990) and the immediate feedback helped Students with attention/impulivity difficulties because they can not work successfully toward long-term rewards, no matter how appealing the incentive (Rief, 1995).
The following is an example of how this teacher used the study conducted by Winne, et al (1993) in her classroom. Even though the ADD/ADHD students in her classroom were the targeted group, all students benefited.

Due to the shortage of teachers and tutors, the class of twenty-four students was randomly divided into six small groups. Each of the two teachers' associates and two parent volunteers, who help in this classroom, took one member of a group and followed the process developed by Winne, et al (1993). When all members of one group complete the task a second group began. This continued until the entire class participated.

The passage used in this activity was from *Alexander and the Terrible, Horrible, No Good, Very Bad Day* by Judith Viorst, 1972, (no page number identified).

"When we picked up my dad at his office he said I couldn’t play with his copy machine, but I forgot. He also said to watch out for the books on his desk, and I was careful as could be except for my elbow. He also said don’t fool around with his phone, but I think I called Australia. My dad said please don’t pick him up anymore."

The teacher/tutor asked the question, "Why do you think Alexander was having a bad day at dad’s office?"

One student answered, "Because dad said not to pick him up from his office anymore."

Another student answered, "Because Alexander made a mess in dad’s office."

The teacher/tutor wrote down the students’ answers and then read them back to the students. The students then had to find the "critical facts" that justified their answers and underline them in their copy of the text.
The first student's copy:

"When we picked up my dad at his office he said I couldn't play with his copy machine, but I forgot. He also said to watch out for the books on his desk, and I was careful as could be except for my elbow. He also said don't fool around with his phone, but I think I called Australia. My dad said please don't pick him up anymore."

The second student's copy:

"When we picked up my dad at his office he said I couldn't play with his copy machine, but I forgot. He also said to watch out for the books on his desk, and I was careful as could be except for my elbow. He also said don't fool around with his phone, but I think I called Australia. My dad said please don't pick him up anymore."

The teacher/tutor immediately corrected the students' copies of the text. If the responses were correct, the student was praised immediately. If the responses were incorrect the student would make another selection. If the second selected answer was correct, the teacher/tutor would praise the student for a job well done. However if the second selection was not correct the student was guided to the correct response by the teacher/tutor and justification for the correct answer was given.

As this type of activity was repeated it was noted that fewer incorrect responses were given and that there was carry-over to other reading material. When students needed to use their inference-making skills when responding to questions, the students with an attention deficit answered correctly as often as those students without attention deficits.

Summary

Many students that have been diagnosed with an attention deficit often have difficulties in reading comprehension due to the nature of their disability. Mastering inference-making skills is an essential part of the reading
comprehension processes and without this skill reading comprehension would be incomplete. Students who have reading comprehension difficulties due to a deficiency in their inference-making skill benefited from the afore mentioned teaching methods and strategies. By taking a large amount of information and dividing and organizing it into smaller, more manageable pieces, as Johnson and Johnson (1989) did, the ADD/ADHD student was able to focus on one part of the information at a time. By incorporating visual aides such as charts, graphs (Barkley, 1997), color-coding (MacQueen, 1991; Weiner, 1991; Woods, 1991), and illustrations found in picture books, (Johnson, et al., 1997), into lessons, many of the instructional needs of these students are being met.

When teaching methods included the use of workbooks, working in small cooperative groups (United States Department, 1994), and giving immediate, positive feedback (Rief, 1995) the ADD/ADHD student was able to remain focused and stay on task.

Attention deficit students have additional and unique needs as learners. With a few adaptations and modifications of teaching materials, teaching methods, and strategies, inference-making will become a building block not a stumbling block on the road to improved reading comprehension.
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Appendix A
The Barrett Taxonomy
Cognitive and Affective Dimensions of Reading Comprehension

**Inferential Comprehension.** Demonstrated when student uses the ideas and information explicitly stated in a selection, his intuition, and his personal experience as a basis for conjectures and hypotheses. Inferences drawn may be either convergent or divergent in nature and student may or may not be asked to verbalize the rational underlying his inference. In general, then inferential comprehension is stimulated by purposes for reading and teachers' questions which demand thinking and imagination that go beyond the printed page.

1. **Inferring Supporting Details.** Asked to conjecture about additional facts the author might have included in the selection which would have made it more informative, interesting, of appealing.

2. **Inferring Main Ideas.** Required to provide the main idea, general significance, theme or moral which is not explicitly stated in the selection.

3. **Inferring Sequence.** May be requested to conjecture as to what action or incident might have taken place between two explicitly stated actions or incidents, or he may be asked to hypothesize about what would happen next if the selection had not ended as it did but had been extended.

4. **Inferring Comparison.** Student required to infer likenesses and differences in characters, times, or places. Such inferential comparisons revolve around ideas such as: “here and there,” “then and now,” “he and she,” “he and he,” and “she and she.”
5. Inferring Causes and Effect Relationships. Required to hypothesize about the motivation of characters and their interactions with time and place. He may also be required to conjecture as to what caused the author to include certain ideas, words, characterizations, and actions in his writing.

6. Inferring Character Traits. Asked to hypothesize about the nature of characters on the explicit clues presented in the selection.

7. Inferring Outcomes. Requested to read an initial portion of the selection and on the basis of this reading he is required to conjecture about the outcome of the selection.

8. Inferring Figurative Language. Asked to infer literal meaning from the author's figurative use of language.
## Appendix B

**Search Chart**

**Cause and Effect**

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