



Teaching Methods for Students with AD/HD

A Meta-Synthesis

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Abstract

This metasynthesis explores teaching methods and strategies for helping middle school students with ADHD. Students with ADHD show more frequent patterns of inattention, hyperactivity, or impulsivity compared to their peers. There is a significant difference between students with and without ADHD. The severity of ADHD will increasingly affect students' academic performance and social support in the classroom setting. Teachers can improve student performance by incorporating specific interventions, accommodations, and modifications to students' academic curriculum. In addition, the concepts of teacher support, parent collaboration, and student medication were also discussed. This text also provides suggestion and advice for future special education teachers.

1. Introduction

1.1. The problem

According to the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV-TR), which was published by the American Psychiatric Association in 2000: “The essential feature of Attention-Deficit-Hyperactive-Disorder is a persistent pattern of inattention and/or hyperactivity-impulsivity that is more frequently displayed and severe than is typically observed in individuals at a comparable level of development” (p. 85). Individuals with AD/HD show characteristics that include behaviors that are viewed as frequent, persistent, and or severe. For adequate diagnosis of AD/HD, six or more symptoms from diagnostic criteria for AD/HD are needed to be consistent for six months and symptoms need to be displayed before the age of 7. This does not mean that individuals that exhibit characteristics of AD/HD older than the age of 7 cannot be diagnosed. It just means that individuals that display characteristics of AD/HD later on in life probably displayed characteristics of this disability before the age of seven (Taylor, Smiley, & Richards, 2009).

The American Psychiatric Association (2000) found that the estimated amount of school children that have AD/HD varies between 3% and 5%. As a result, AD/HD is considered one of the most prevalent categories of exceptionality. As more students are diagnosed with AD/HD, there is a high probability that most teachers will have the opportunity to plan material for or teach students with AD/HD (Taylor et al., 2009).

1.2. Author's beliefs and experiences

My name is Matt Creamer and I am 29 years old. I have teaching experience in multiple settings. My first teaching experience came from Reno, Nevada. Reno is located near Lake Tahoe and offers plenty of outdoor entertainment as well as gambling temptation. I consider

Reno an urban area because the city has a population of over 200,000 people and is home to many minority groups with various income levels. My current teaching experience consists of elementary and middle schools in Homer, Alaska. Homer is my hometown and I consider it to be a rural/suburban community. I say rural/suburban because Homer is primarily a small fishing town with mostly middle class families.

In Homer, the last three years I have accumulated teaching experience in special education resource rooms as well as special needs classrooms. I have discovered that I enjoy teaching students in the middle school resource room. I seem to do well teaching struggling students with study skills, organization and key concepts. Most of the students I teach either have Attention Deficit Disorder (ADD) or AD/HD. In addition, I teach students that have undiagnosed learning disabilities.

I feel to be a great teacher you must enjoy students as well as have something in common with them. For example, if you are talented at math or history you should share your love of that subject with your students by teaching them. Growing up, my educational experience included some help from resource teachers. Because of the resource help I received when I was going to school, I feel the need to give back to students that are having a similar educational experience as mine.

Being an individual that has received resource help during my adolescence, I can identify that I struggled with learning in general growing up. Assignments were always difficult for me to complete. In addition, I always felt like it took longer for me to complete assignments. My learning struggles in school were attributed to a number of reasons. One reason was because I was slow processor. Meaning that it took longer for me to understand assignments as well as complete them successfully. During my elementary schools years I also lacked the proper

organizational skills to submit quality work in a timely manner. Therefore my work was often incomplete and lacked substance; my attempts to complete these assignments made me anxious.

As a youngster I remember feeling overwhelmed, frustrated and even scared during my school years because learning was hard for me. I can vividly remember instances during my school experience where I broke down in tears because I was completely overwhelmed with the assignment at hand. Through experience and help from teachers and parents I feel I have made vast improvement and have developed personal learning strategies. Therefore, I feel it is my duty to pass my knowledge concerning learning methods to students that struggle with the same issues as I experienced as a student.

Having attention span, patience and problem solving ability are three keys to being a successful learner. I feel the reason I enjoy teaching students in the resource room at the middle school level is because these students struggle with learning strategies, especially students that are diagnosed with AD/HD. My goal as a teacher is to help my students realize their potential without them being overwhelmed by expectation.

The biggest problem I had with learning throughout my school years was lacking the ability to make a plan and being able to stick to it. In most cases I would look at the directions or idea of a project and immediately feel overwhelmed because I would instantly imagine all the work that was going to go into the final product. For example, I remember in fifth grade our class was assigned individual science fair projects. I knew what I wanted to do for my project. I decided to do my science fair project on metal corrosion. I was interested to see what types of metal collected the most rust. I had also seen examples of other students' science fair projects. For example, one of my friends was going to do his project on bread mold while another friend of mine was going to do his project on aerodynamics.

Throughout the project I was able to visualize what my project would look like after completion. My trouble with this project was I did not know where to begin or how to develop a plan for my project. As a result, throughout my school career I felt like I lacked the ability to organize my schoolwork into a series of small steps. I feel that if I possessed the knowledge to make a list of small steps (i.e., a task analysis), I would have been less overwhelmed. This is because I feel I would have been able to look at larger projects as a series of small activities, as opposed to one large intimidating beast.

As a teacher and adult there are three actions I take when completing tasks at school or at home. The first action I take is I keep a daily planner of what I need to do or want to accomplish in order of most importance. If I complete an assignment I cross it out on my planner, and if I do not I add it to the following day. Having a planner keeps me organized and motivated because I am able to see every activity I complete. In terms of larger projects, I usually brainstorm a topic and outline all the specific steps in order that are involved in completing the project. The second action I take is allotting myself more time to complete a task. I know from past experience that it takes longer for me to complete assignments. So as a result, I have just accepted the fact that assignments are going to take longer and simply plan more time for specific activities. Third, I have learned that it is inefficient in terms of time management to ponder over one step for too long. Instead I either break the task into smaller steps or ask for help. This way, I never feel stuck, overwhelmed and am always looking ahead to the next task.

In respect to students with AD/HD, I have noticed that they like me struggle with Learning strategies. What I notice in particular with most my students with AD/HD is that they are very bright and have all the tools to be successful students and individuals; they just need teachers that can show them the path to success. Being a resource teacher I believe it is crucial to

teach organizational and planning strategies along with traditional content knowledge. My favorite aspect of teaching is witnessing my students solve problems on their own.

In my current resource classroom I use prompting, redirection, and positive reinforcement in my teaching. For example, if a student is off task I prompt them to get back on task. If a student is struggling to find information I ask them where they can find the information they need. When a student is being productive or doing well in class I reward them with treats. Teaching learning strategies has always interested me because I know from my personal experiences how important they are to peoples learning. I know some learning strategies but am interested in learning how to efficiently incorporate them into my classroom.

As an adult and teacher that has struggles with learning I have come up specific research questions:

1. What are the common characteristics of students with AD/HD and why do students with this disability struggle with learning?
2. How can teachers help students with AD/HD?
3. What are specific teaching methods for students with AD/HD and why are they important?
4. How do teachers use specific learning strategies to improve their students' lives at school and in everyday life?

Having had help through resource teachers during my elementary school years has helped me develop the understanding and desire to want to help students with learning disabilities. As do most teachers, I am always thinking of ways to help students learn more efficiently. Becoming a more efficient learner is an area I am constantly improving in and would enjoy

learning more about. I want to show my students that challenges at school and in life are very manageable when they are broken down in smaller pieces.

1.3. Purpose of this meta-synthesis

The purpose of this meta-synthesis was to review the literature on effective teaching methods for students with AD/HD. I hope to use what I have learned from this meta-synthesis to better help my students with AD/HD.

2. Methods

2.1. Selection criteria

The 30 journal articles in my meta-synthesis pertain to the following criteria:

The articles I used investigated issues relating to secondary education and ADD and AD/HD.

1. The articles contained in this writing were published in journals that are usually read by school psychologists and/or special educators.
2. The articles used were published in the years between 1994 and 2010.

2.2. Search procedures

I conducted database searches and ancestral searches to locate articles for this meta-synthesis.

2.2.1. Database searches

In fall 2010, I conducted systematic searches in the Education Resources Information Center (ERIC, Ebscohost) database, using the following search term combinations:

1. (“Attention Deficit Disorders”) AND (“Middle Schools”).
2. (“Attention Deficit Disorders”) AND (“Intermediate Grades”).
3. (“Attention Deficit Disorders”) AND (“Junior High Schools”).

The database searches found 27 articles that met the selection criteria (Bradley, Shapiro, & Dupaul, 1997; Barron, Evans, Baranik, Zewelani, & Buvinger, 2006; Barry, Lyman, & Klinger, 2002; Carroll, Houghton, Taylor, Hemingway, List, Cordin, & Douglas, 2006; Cook & Cameron, 2010; Demaray & Elliot, 2001; Evans, Langberg, Raggi, Allen, & Buvinger, 2005; Evans, Green, & Serpell, 2005; Evans, Timmins, Sibley, White, Serpell, & Schultz, 2006; Evans, Serpell, Schultz, & Pastor, 2007; Gau, Soong, Chiu, & Tsai, 2006; Gureasko, DuPaul, & White, 2007; Jones, Boon, Fore, & Bender, 2008; Langberg, Epstein, Altaye, Molina, Arnold, & Vitiello, 2008; Lewandowski, Lovett, Parolin, Gordon, & Coddington, 2007; Lonigan & Vasey, 2009; Mathers, 2005; Mattison & Schneider, 2009; Meyer & Kelley, 2007; Nowacek & Mamlin, 2007; Ota & DuPaul, 2002; Shapiro et al., 1996; Willard, 2002; Witzel & Allsopp, 2007; Zirkel & Gluckman, 1996a, 1996b).

2.2.2. Ancestral searches

To document ancestral searches the process involves reviewing the reference lists of works that have been previously published to find literature pertaining to one's topic of interest (Welch, Brownell, & Sheridan, 1999). After reviewing reference lists of the articles retrieved through my database searches, I conducted ancestral searches. These particular ancestral searches yielded three additional items that met my selection criteria (Miller & Kelley, 1994; Purdie, Hattie & Carroll, 2002; Wilson & Lipsey, 2007).

2.3. Coding procedures

I used a coding form to categorize the information presented in each of the 30 articles. This coding form was based on: (a) publication type; (b) research design; (c) participants; (d) data sources; and (e) findings of the studies.

2.3.1. Publication type

I used classification and evaluation of articles by publication type (e.g., research study, theoretical work, descriptive article, opinion piece/position paper, guide, annotated bibliography, review of literature). *Research studies* use systematic methods to analyze or gather qualitative or quantitative data. *Theoretical work* is a piece of writing that describes or develops theory. *Descriptive articles* describe phenomena or experience but do not use systematic methods to analyze or gather data. *Opinion piece/position paper* explains an opinion an author has about a certain issue; these articles may advocate or support particular political views, policy positions educational objectives, or philosophical ideas. *Guides* recommend strategies or explain how people of practice might implement curricula, programs, or policies. *Annotated bibliographies* are articles, documents about a topic, or a list of books that contain a citation of each item followed through a brief description or critical evaluation. *Review of literature* synthesize and summarize essential themes of previously published works on a topic (Table 1).

2.3.2. *Research design*

Classification of each empirical study was done through research design (i.e., qualitative research, quantitative research, mixed methods research). *Qualitative* researchers use language instead of numbers to tell people's stories and describe phenomena and experiences. *Quantitative* researchers analyze and collect numerical data. *Mixed methods* research is a combination of qualitative (i.e., non-numerical) and quantitative (i.e., numerical) research methods within a specific study (Table 2).

2.3.3. *Participants, data sources, and findings*

Participants were identified in each of these studies. (e.g., students with ADHD grades 6-9, parents, teachers). I also identified the data sources that were analyzed in each study (e.g.,

questionnaires, rating scales, behavior scales, transcripts, standardized tests, learning samples, reports, checklists, surveys). Finally, I summarized the findings of each study (Table 2).

2.4. Data analysis

A modified version of the Stevick-Colaizzi-Keen method employed by (Duke, 2011) and (Duke & Ward, 2009) was used to analyze the 30 articles incorporated in this meta-synthesis. I identified significant statements within each article. For the purpose of my meta-synthesis, I defined significant statements as statements that addressed issues related to teaching middle school students with characteristics of ADHD. Next, I developed a list of non-repetitive significant statements with formulated meanings. The formulated meanings indicate my understanding of each significant statement. Lastly, I clumped the formulated meanings from the 30 articles into emergent themes or theme clusters. The emergent themes that were discovered represented the soul of the entire body of literature included in (Table 3).

3.1. Publication type

I found 30 articles that fell into my selection criteria. The publication type for each article is differentiated in Table 1. Twenty-one of the 30 articles (70.0%) included in the meta-synthesis were research studies (Barron et al., 2006; Barry et al., 2002; Carroll et al., 2006; Cook & Cameron, 2010; Demaray & Elliot, 2001; Evans et al., 2005; Evans et al., 2007; Gau et al., 2006; Gureasko et al., 2007; Jones et al., 2008; Langberg et al., 2008; Lewandowski et al., 2007; Lonigan et al., 2005; Mattison & Schneider, 2009; Miller & Kelley, 1994; Meyer & Kelley, 2007; Nowacek & Mamlin, 2007; Ota & DuPaul, 2002; Upadhyaya et al., 2004; Wilson & Lipsey, 2007). Four of the articles (13.3%) were descriptive articles (Shapiro & e.g., 1996; Witzel & Allsopp, 2007; Zirkel & Gluckman, 1996a, 1996b). Three articles (10.0%) were guides (Bradley et al., 1997; Evans et al., 2005; Evans et al., 2006). One article (3.3%) was an opinion

piece/position paper (Willard, 2002). One article (3.3%) was a review of literature (Purdie, et al., 2002).

Table 1

Author(s) & Year of Publication	Publication Type
Bradley, Shapiro, & Dupaul, 1997	Guide
Barron, Evans, Baranik, Zewelanj, & Buvinger, 2006	Study
Barry, Lyman, & Klinger, 2002	Study
Carroll, Houghton, Taylor, Hemingway, List, Cordin, & Douglas, 2006	Study
Cook & Cameron, 2010	Study
Demaray & Elliot, 2001	Study
Evans, Langberg, Raggi, Allen, & Buvinger, 2005	Guide
Evans, Green, & Serpell, 2005	Study
Evans, Timmins, Sibley, White, Serpell, & Schultz, 2006	Guide
Evans, Serpell, Schultz, & Pastor, 2007	Study
Gau, Soong, Chiu, & Tsai, 2006	Study
Gureasko, DuPaul, & White, 2007	Study
Jones, Boon, Fore, & Bender, 2008	Study
Langberg, Epstein, Altaye, Molina, Arnold, & Vitiello, 2008	Study
Lewandowski, Lovett, Parolin, Gordon, & Coddling, 2007	Study
Lonigan & Vasey, 2009	Study
Mathers, 2005	Study
Mattison & Schneider, 2009	Study
Miller & Kelley, 1994	Study
Meyer & Kelley, 2007	Study

Nowacek & Mamlin, 2007	Study
Ota & DuPaul, 2002	Study
Purdie, Hattie, & Carroll, 2002	Review
Shapiro & e.g., 1996	Descriptive Article
Upadhyaya, Brady, & Wang, 2004	Study
Willard, 2002	Opinion Piece/Position Paper
Wilson & Lipsey, 2007	Study
Witzel & Allsopp, 2007	Descriptive Article
Zirkel & Gluckman, 1996a	Descriptive Article
Zirkel & Gluckman, 1996b	Descriptive Article

3.2. Research design, participants, data sources, and findings of the studies

There were 21 research studies that met my selection criteria. (Barron et al., 2006; Barry et al., 2002; Carroll et al., 2006; Cook & Cameron, 2010; Demaray & Elliot, 2001; Evans et al., 2005; Evans et al., 2007; Gau et al., 2006; Gureasko et al., 2007; Jones et al., 2008; Langberg et al., 2008; Lewandowski et al., 2007; Lonigan et al., 2005; Mathers 2005; Mattison & Schneider, 2009; Miller & Kelley, 1994; Meyer & Kelley, 2007; Nowacek & Mamlin, 2007; Ota & DuPaul, 2002; Upadhyaya et al., 2004; Wilson & Lipsey, 2007). The research design, participants, data sources, and findings of the studies are described in Table 2.

Table 2

Authors	Research Design	Participants	Data Sources	Findings
Barron, Evans, Baranik, Zewelani, & Buvinger, 2006	Quantitative	70 students in 6 th grade, ranging in age from 10 to 13 years old, from 5 middle schools in the Shenandoah Valley of Virginia	Diagnostic Interview Schedule for Children, Kaufman Brief Intelligence Test, Wechsler Individual Achievement Tests-II, Disruptive Behavior Disorders Rating Scale, Impairment Rating Scale, Pattern of Adaptive Learning Scales, grade point average	A number of interesting differences for students with ADHD, especially pertaining to performance-avoidance goals.
Barry, Lyman, & Klinger, 2002	Quantitative	66 children, ranging in age from 8 years 9 months to 14 years 5 months; the ADHD group consisted of 33 children (21 males and 12 females)	Tower of Hanoi – Wisconsin Card Sorting Test, Trail Making Test, Part B, Kaufman Brief Intelligence Test, Woodcock-McGrew-Werder Mini-Battery of Achievement, DCV-IV ADHD Checklist, Behavior Assessment System for Children – Parent Rating Scale, Home Situations Questionnaire	The more severe the behavioral symptomatology of children with ADHD is, the more negatively their school performance could be impacted.
Carroll, Houghton, Taylor, Hemingway, List, Cordin, & Douglas, 2006	Quantitative	70 children (35 with ADHD and 35 without ADHD), 3-8 years old, were matched according to age, grade, and school class	Parental reports, questionnaires, Response to Interpersonal and Physically Provoking Situations (RIPPS), Emotional Intensity Scale for Children	Children with ADHD display significantly more severe and frequent solitary off-task and challenging behaviors, and more frequent vocalizations and severe interactional off-task behaviors.

Cook & Cameron, 2010	Quantitative	Study #1: 14 inclusive teachers of 26 students with disabilities; Study #2: Students with learning disabilities (n=77), cognitive disabilities (n=44), attention-deficit disorder (n=20), behavioral disorders (n=19, and no disabilities (n=1,153) in 65 inclusive classes; the teachers of these students	Basic Scale of Disability Severity (BSDS), Inclusive Classroom Observation System (ICOS)	Study #1: Partial correlations and controlling for severity of disability, indicated that instructional-academic interactions corresponded with teachers' concern ratings and non-instructional-behavioral interactions corresponded with teachers' rejection ratings. Study #2: Students in all disability categories received higher concern ratings than nondisabled students, students with behavioral disorders and learning disabilities received higher rejection ratings than nondisabled students, and students with behavioral disorders received significantly higher rejection ratings than students with cognitive disabilities.
Demaray & Elliot, 2001	Quantitative	29 teachers and 94 boys, in Grades 3-6, and their parents from seven schools and three school districts in Minnesota, Nebraska, and Wisconsin.	Rating Scales: Inattention Overactivity with Aggression Conners, Attention-Deficit/Hyperactivity Disorder-IV, Social Skills Rating System, Student Self – Concept Scale, Social Support Questionnaires for Teachers and Parents	Data from the rating scales indicated children with ADHD perceived lower frequencies of overall social support when compared to a control group. Children with severe ADHD-type perceived less overall support and support from close friends and classmates.
Evans, Green, & Serpell, 2005	Quantitative	69 faculty and staff from 5 middle	Feasibility Questionnaire, Behavior	Data collected about the Community Development process

		schools in the Shenandoah Valley, Virginia, and included 48 regular-education teachers, 9 special-education teachers, 5 school counselors, and 4 school-level administrators; 3 did not report an occupation	Intervention Rating Scale (both use Likert-type and open ended questions specific to the Challenging Horizons Program)	indicate that the strengths out-weigh potential limitations.
Evans, Serpell, Schultz, & Pastor, 2007	Quantitative	79 young adolescents with ADHD, between the ages of 10 and 14 years in 6 th grade from 5 middle schools in rural Virginia.	Diagnostic Interview Schedule for Children-IV, Kaufman Brief Intelligence Test, Wechsler Individual Achievement Test-II, Services Use In Children and Adolescents – Parent Interview, Disruptive Behavior Disorders Rating Scale, Impairment Rating Scale, Social Skills Rating Scale, grades	There were cumulative long-term benefits for the treatment group in the study as measured by parent ratings of social functions and ADHD symptoms. Although, parent and teacher reports indicate no cumulative academic benefits, within-year analyses suggest a trend towards benefits of student grade point average.
Gau, Soong, Chiu, & Tsai, 2006	Quantitative	2,584 first to ninth graders in Taipei and 479 clinical participants (274 with ADHD)	Conners' Parent and Teacher Rating Scales – Revised: Short Forms (CPRS-R:S-C and CTRS-R:S-C), Chinese versions of the Swanson, Kotkin, Atkins, M-Flynn, and Pelham Rating Scales	Satisfactory factor structure, test retest reliability, internal consistency, and convergent validity in all sub scales for CTRS-R: S-C, and CPRS-R: S-C. The test clearly distinguishes clinical participants and ADHD from the ones that do

Gureasko, DuPaul, & White, 2007	Quantitative	6 male students ranging in age from 11 to 12 years	Classroom preparation behavior, homework behavior, behavior checklist.	not. The percentage of classroom homework behaviors and preparation skills increased for all participants as a function of self-monitoring. Parent, student, teacher acceptance of the self-management intervention were assessed to be high.
Jones, Boon, Fore, & Bender, 2008	Quantitative	7 6 th grade students with high-incidence disabilities between the ages of 12 years 1 month and 13 years 3 months	Baseline data, <i>Mystery Hero</i> intervention, maintenance probes, observation	The results suggest the intervention was effective in decreasing the frequency of the target behavior, as a significant reduction of verbally disrespectful behaviors was stated.
Langberg, Epstein, Altaye, Molina, Arnold, & Vitiello, 2008	Quantitative	Children between 7 and 9 years of age with diagnoses of ADHD (n=258) and grade- and sex-matched controls (n=112).	SNAP-IV Rating Scale	Environmental changes associated with middle school transitioning coincide with transient reversal ADHD symptom decline with children with ADHD.
Lewandowski, Lovett, Parolin, Gordon, & Coddling, 2007	Quantitative	65 middle school students (33 boys and 32 girls) initially recruited from 3 school districts in central and eastern New York	Background questionnaire, ADHD Symptom Rating Scale, observation	Even though students with ADHD tend to work with less overall efficiency in processing speed and task fluency, There is no significant difference compared to non-disabled students when given an extended amount of time on a speed math task.
Lonigan & Vasey, 2009	Quantitative	104 (49% female) children and	Positive and Negative Affectivity Schedule, Effortful	Effortful control moderated the relationship between

		adolescents from the 4 th to 12 th grades were selected from a screening sample of 722 children attending a university research school	Control Scale, Revised Children's Manifest Anxiety Scale	Negative affectivity and attentional bias; children with low level of EC and high levels of NA were the only children that showed attentional bias to treat stimuli.
Mathers, 2005	Quantitative	22 eight to twelve year-old children (11 with a diagnosis of ADHD and 11 matched peers) comprised the community-based sample	Clinical Evaluation of Language Function, Test of Pragmatic Language, transcripts of audio and video recordings	Differences are largely attributed to differences between group scores in written material.
Mattison & Schneider, 2009	Quantitative	24 middle school students with ED (Grades 6 to 8) were followed during their first year in a special self-contained ED program, in 2 groups of 10 and 14 students over consecutive years (during which the program did not change).	Measures of school functioning collected from previous year: grade point average and failures, absences (for any reason), days tardy, formal disciplinary referrals without out-of-school suspensions and with out-of-school suspensions, Global Family Environment Scale, Woodcock Reading Mastery Tests – Revised.	Significant improvement with average effect size of .61 was found for 5 of the 6 functional measures. As well as for ADHD (inattentive type) and for conduct disorder categories of Adolescent Symptom Inventory (ASI4T).
Miller & Kelley, 1994	Quantitative	4 parent-child dyads in which the child exhibited	Homework problem checklist, accuracy of completed homework, treatment	Two of the four subjects showed substantial improvements in on-task behavior.

		substantial homework problems	integrity checklist, parent's consumer satisfaction questionnaire, follow-up interview, observation	
Meyer & Kelley, 2007	Quantitative	42 students (36 boys, 6 girls) in grades 6 th -8 th and their parents	Conners' Parent Rating Scales, ADHD Rating Scale-IV, Anxiety Disorders Interview Schedule for DSM-IV, Parent and Child Versions (ADIS: P/C; Silverman & Albano, 1996), homework problem checklist, classroom performance survey, teacher reported homework grades, consumer satisfaction questionnaire.	Both interventions improved HPC AND CPS scores, and the percent of completed homework in comparison with the wait-list control group.
Nowacek & Mamlin, 2007	Qualitative	4 elementary school general education teachers' and 2 middle grade teams	Interviews asking semi-structured questions aligned with literature in the interview; tape-recorded and transcribed interviews verbatim, triangulated data by conducting classroom observations, and field notes.	Both middle and elementary school teachers knew key characteristics of needs of these students with ADHD. Although the teachers knew the characteristics and needs of these students there were few modifications that the majority or all of the teachers made a both grade levels.
Ota & DuPaul, 2002	Quantitative	Three 4 th to 6 th grade students with attention-deficit hyperactivity disorder	Computer software, Math Blaster, math skill probes, observations of classroom behavior	The hypothesis that math software with a game format would improve academic performance and increase attention of all participants was partially supported.

Upadhyaya, Brady, & Wang, 2004	Quantitative	16 adolescents, aged 12 to 19; 11 participants had ADHD	Rating scales, questionnaires, self-reports, diaries, follow-up visits	There was a decrease in carbon monoxide levels and the average number of cigarettes smoked over the course of the treatment. There was not a significant change in ADHD symptoms during the study. Intent-to-treat analysis showed that 31.25% of the adolescents had completely abstained after 4 weeks of taking bupropion SR.
Wilson & Lipsey, 2007	Quantitative	Not applicable; researchers did not collect primary data from human subjects	Meta-analysis of 249 experimental and quasi-experimental studies of school-based programs with outcomes representing aggressive and/or disruptive behavior were obtained	Positive intervention effects were found on aggressive and disruptive and other outcomes that were relevant. Universal and targeted programs for selected/indicated children were the most common and effective approaches.

3.2.1 Research design

Twenty of 21 studies (95.2%) reviewed for this meta-synthesis used a quantitative research design (Barron et al., 2006; Barry et al., 2002; Carroll et al., 2006; Cook & Cameron, 2010; Demaray & Elliot, 2001; Evans et al., 2005; Evans et al., 2007; Gau et al., 2006; Gureasko et al., 2007; Jones et al., 2008; Langberg et al., 2008; Lewandowski et al., 2007; Lonigan et al., 2005; Mathers, 2005; Mattison & Schneider, 2009; Miller & Kelley, 1994; Meyer & Kelley, 2007; Ota & DuPaul, 2002; Upadhyaya et al., 2004; Wilson & Lipsey, 2007;). One study (4.8%) used a qualitative research design (Nowacek & Mamlin, 2007).

3.2.2. Participants and data sources

The 21 studies in this meta-synthesis analyzed data collected from students with ADHD (Grades K-12), teachers of students with ADHD, and parents of children with ADHD. Seven of the 21 studies (33.3%) analyzed data collected from middle school students (Barron et al., 2006; Evans et al., 2007; Gureasko et al., Jones et al., 2008; Lewandowski et al., 2007; Mattison & Schneider, 2009; Meyer & Kelley, 2007;). Three of the studies (14.3%) investigated the data of elementary and middle school students with ADHD (Barry et al., 2002; Mathers, 2005; Ota & DuPaul, 2002;). Three of the studies (14.3%) analyzed data collected from students, parents, and/or teachers of students with ADHD (Cook & Cameron, 2010; Demaray & Elliot, 2001; Miller & Kelley, 1994;). Two studies (9.5%) analyzed data collected from elementary students with ADHD (Carroll et al., 2006; Langberg et al., 2008;). Two of the studies (9.5%) evaluated teachers of students with ADHD (Evans et al., 2005; Nowacek & Mamlin, 2007). Two of the studies (9.5%) examined data of K-12 students with ADHD (Gau et al., 2006; Lonigan et al., 2005). One study (4.7%) probed data on middle and high school students with ADHD (Upadhyaya et al., 2004).

The most frequent type of data that appeared in the studies for the meta-synthesis consisted of rating scales, questionnaires, and interviews. Six of these studies (29%) used observations in the data collection (Cook & Cameron, 2010; Jones et al., 2008; Lewandowski et al., 2007; Miller & Kelley, 1994; Nowacek & Mamlin, 2007; Ota & DuPaul, 2002;). Four of the studies (19%) used standardized testing in the data collection (Barron et al., 2006; Barry et al., 2002; Evans et al., 2007; Mattison & Schneider, 2009). Four of the 21 studies (19%) included checklists as part of data collection (Barry et al., 2002; Gureasko et al., 2007; Miller & Kelley, 1994; Meyer & Kelley, 2007;). One study (4.7%) was a meta-analysis of 249 experimental and quasi-experimental studies (Wilson & Lipsey, 2007). Besides rating scales, questionnaires, interviews, standardized test scores, and secondary data sources, additional methods were used to collect and/or analyze data for one or more of the 21 studies, including: schedules, probes, reports, grades, instruments, behavior, school performance, evaluation, transcripts, audio/video recordings, measures of school functioning, surveys, field notes, computer software, self-reports, diaries, follow-up visits, and bibliographic documentation.

3.2.3. Findings of the studies

The findings of the 21 studies incorporated in this meta-synthesis can be summarized as follows:

1. Differences between students with ADHD and without ADHD can be easily indentified. Furthermore, there is a significant difference between students with and without ADHD.
2. The severity of ADHD will have a large impact on student performance and the amount of social support the student receives. Students with lower levels of ADHD will perform at a higher rate and experience more social support when compared to students that possess higher levels of ADHD.

3. Students with ADHD can improve their classroom performance and behavior through specific intervention strategies.

4. There is no significant difference between school performance of students with ADHD and students without ADHD. In other words, there may be no academic difference between these two groups of students because the differences are too hard to differentiate.

3.3. Emergent themes

Six themes emerged from the analysis of 30 articles that were included in my review of literature. The emergent themes” (or theme clusters) include: (a) characteristics of students with ADHD; (b) teaching and learning strategies for students with ADHD; (c) behavioral strategies and characteristics of students with ADHD; (d) academic work and school performance of students with ADHD; (e) transition strategies inside and outside of school for students with ADHD; (f) medical interventions and psychotherapy for students with ADHD. The six theme clusters and their related formulated meanings are described in Table 3.

Table 3

Theme Clusters	Formulated Meanings
Characteristics of Students with ADHD	<ul style="list-style-type: none"> • Boys are more likely to show characteristics of ADHD compared to girls, but differences cannot be explained. • Symptoms of hyperactivity decrease with age but there is not a correlation between inattention and age. • There is a difference between the way students with ADHD use language compared to their peers. Academic underachievement of students with ADHD is a noticeable characteristic in the areas of reading, writing, and math.
Teaching and Learning Strategies For Students with ADHD	<ul style="list-style-type: none"> • Find the appropriate curriculum for student with ADHD. • Modify the curriculum as a way to change inappropriate behavior. • Use manipulatives when teaching students with ADHD to link prior knowledge. • Encouraging think-aloud modeling is a great way to verbalize the thinking process. • Help students understand relevance of concepts through verbal, visual and modeling. • Multi-sensory cueing is a fantastic way to teach students with ADHD. • Rewards are phenomenal ways to increase school performance, and behavior. • Collaborative consultation models with direct and indirect services are effective methods for teaching students with ADHD. • Using math software increases class participation and engagement while decreasing disruptive or off-task behaviors. • Integrating a game format with seatwork/worksheets can slightly improve students' math scores. • Contingency contracts help improve homework accuracy. • Goal setting is very important when managing the behavior of students with ADHD. • Important teaching strategies and effective delivery for students with ADHD can be discovered using a consultative model. • In-service training can help teachers learn more about how to better serve students with ADHD. • Parent, teacher, and student evaluation of self-management interventions concerning students with ADHD are high. • Audiotapes, reading material out-loud, differentiated assignments, extending time on assignments, changing environment, computer use, checking in with students, and using reminders are all great strategies for teaching students with ADHD. • The strengths of the CDT process outweigh its weaknesses. • Organization, note taking, study skills, are key aspects of CHP.

	<ul style="list-style-type: none"> • Interpersonal Skills Group (ISG) target social skills like skill development, problem solving, and social cues.
Behavioral Strategies and Characteristics of Students with ADHD	<ul style="list-style-type: none"> • Behavior and academic performance decrease as holiday or vacation time approaches. • Self-monitoring is as effective as parent monitoring when improving organization, test preparation, procrastination note taking etc. • Group contingency interventions help decrease disrespectful behaviors of students with ADHD. • Students with more severe cases of ADHD display a more negative impact on academic performance. • Universal programs work well for decreasing behavior problems with students with ADHD. • Challenging behaviors in students with ADHD are associated with positive emotional intensity. • Off-task behavior is directly related to environmental distractions. • Students with behavior disorders and learning disabilities receive higher rejection ratings compared to their peers. • Students with behavior issues receive higher rejection rating when compared to students with cognitive disabilities. • Increased homework behavior and self-preparation is apparent when students with ADHD use self-monitoring.
Academic Work and School Performance of Students with ADHD	<ul style="list-style-type: none"> • Students with ADHD often experience a decline in performance later in the school year compared to the beginning. • Students with ADHD show lower achievement, math fluency, and processing speed. • Given speed math tasks, students with ADHD do not benefit more from extended time when comparing them with their peers. • There is a large variation between the written texts of students with ADHD and students without the disability. • Using the CHP intervention treatment, students with ADHD can improve symptoms and the way in which they act socially. • Using specific CHP interventions there is trend of increased GPA with students that have ADHD. • With the implementation of self-management strategies students with ADHD are able to improve in the areas of organization, class preparation and homework completion. • Teachers of students with ADHD at the middle school and elementary school level fail to make modifications for these students even when teachers are educated on the characteristics of the disability.
Transition Strategies Inside and Outside of School for	<ul style="list-style-type: none"> • Middle school is extra challenging because there are high expectations, the students have lockers, students are expected to take notes, and students have to develop organizational skills. • Students with ADHD lack friends, have difficulty with

Students with ADHD	<p>authorities', and are not liked by peers at middle school.</p> <ul style="list-style-type: none">• Be careful when choosing the LRE for students with ADHD.• During the middle school transition, students with ADHD, show an association with developmental decline concerning impulsivity, inattention, and hyperactivity.• The transition for student with ADHD to middle school is more difficult than it is for their peers.• Parent and self-monitoring techniques improve study skill and homework performance.
Medical Interventions and Psychotherapy for Students with ADHD	<ul style="list-style-type: none">• Medical interventions work well when increasing behavior and memory for students with ADHD.• Psychotherapy improves academics, behavior, and attendance.• Children with more severe cases of ADHD see themselves as having less support from classmates and friends compared to other students.• Self-concept has much to do with how much support students with ADHD feel like they receive.• Brupropion SR and counseling are safe and effective ways to deal with nicotine dependency for individuals that do and do not have ADHD.• Children with high level of NA and low levels of EC showed attention bias as a means to threat the stimuli.

4. Discussion

For this section, I summarized the major themes from the analysis of my 30 articles in this metasynthesis. I related these emergent themes to my practice as a future teacher, and to my personal experience.

4.1. Characteristics of students with ADHD

For some unknown reason more boys show signs of ADHD compared to girls. What is interesting is that there is no evidence that explains why more boys have ADHD. It is said the individuals with ADHD become less hyper as they become older although, but there seems to be no correlation between the age of an individual and how inattentive they are. Lastly, students with ADHD show signs of underachievement in the areas of reading, writing, and math.

Teacher education is extremely important when trying to maximize our students learning potential. As a future teacher I need to continue to educate myself of the current characteristics of ADHD. To educate myself I plan to attend teaching conferences, in-service meetings and read professional journal articles. In addition, knowing the current characteristics of ADHD will help me become more aware of students that might be experiencing this disability because I will be able to identify as well as teach to these students. For example, after I discovered that more boys show signs of ADHD I realized that I was going to have to pay extra attention and differentiate gender specific curriculum in my future classroom. Specific ways I intend to differentiate instructions for boys in my classroom include: making observations, helping them with organization, breaking tasks into small steps or by making individual assignments more interactive. Also, since there is no apparent correlation between age and inattentiveness, I realized that I am going to have to use similar teaching strategies and sensitivity no matter what grade I teach. Finally, I plan to address the issue underachievement in reading, writing, and math

through the use of scaffolding and learning technologies such as computer programs. This way, students will know exactly what they are supposed to be doing and they will have fun doing it.

4.2 Teaching and learning strategies for students with ADHD

Finding appropriate instruction for students with ADHD can be challenging, but is much more manageable with collaboration. The best strategies for teaching students with ADHD include the use of: manipulatives, think-aloud activities, differentiated instruction, computer software, and variety of learning environments. Great ways to improve study skills with students with ADHD include teaching: organization, note taking, problem solving, and social skills. In addition, extending time for work completion, frequently checking in with students and reminding students helps reinforce excellent study habits. Above all, the strategies study skills teachers use to help promote the learning of students with ADHD increase academic performance and decrease undesirable behavior.

I have come to realize that sufficient collaboration might as well be the most important aspect of a successful special education program. I plan to use patience, humor, and awareness to experience successful collaboration with my colleagues. Next, I plan to incorporate and continue to gather strategies that will benefit the success of my students. Study skills, problem-solving skills, and social skills are the most important skills I want to incorporate at the middle school level. In my opinion, possessing these three skills influences success no matter how academically challenged you are. In closing, I want to teach students to “clear their minds” and focus on the present. By using this strategy student will have better concentration and will be less distracted.

4.3 Behavioral strategies and characteristics of students with ADHD

Off-task behavior is directly related to the kind of environment in which students learn. Students with this disability show decreased signs of academic and behavioral performance

around the holidays and at the end of the school year. Two ways to increase academic and behavioral performance is to incorporate group contingency contracts and to promote self-monitoring techniques. Behavioral characteristics directly related to ADHD include: poorer academic achievement compared to their peers, as well as standing a high chance of experiencing rejection.

Being aware of what classroom environments my students struggle in will help me become a more effective educator. In other words, I need to pay attention and observe what occasions specific students need to be working in quiet environments or involved in small group work. In addition, knowing what specific times of year my students lack performance will help me to monitor, understand, and investigate ways to improve student success. For instance I need to accept that before Christmas break or before summer vacation students are going to be more distracted any less likely to learn. As a result, I have learned that as a future teacher I need to push my students hard during the middle of the semester. This way, the students and I will be able to compensate for the loss of learning that occurs before vacation time. Behavior contracts have proven to be an effective way of increasing student behavior. This is because students are held accountable for their actions and are motivated to improve their behavior as they have the opportunity to receive rewards. I will defiantly incorporate some type of contingency contract in my classroom. As a result, my students will do better in school and will have more friends.

4.4 Academic work and school performance of students with ADHD

Studies have found that students with ADHD show low achievement in math fluency and processing speed. In addition, there is no concluding evidence proving that these students benefit from time extensions during speed math, and demonstrate a large variation in writing quality compared to their peers. Self-management was found to improve organization, class preparation,

and homework completion.

As I have become aware that students with ADHD struggle with math, processing speed and writing quality I intend to incorporate teaching strategies such as: manipulatives, computer software, varied learning environments etc. to accommodate struggling students with this disability. For example, computer software can help students learn because playing math games are interactive and fun. Also, computers can improve students' handwriting as well as spelling and grammar. This is because students have the opportunity to type their work as opposed to being forced to write legibly with pencil and paper. In addition, while using computers students have access to tools such as the spell checker the thesaurus. I will defiantly incorporate self-management techniques in my classroom as they have proven to be effective in improving the study skills of students with ADHD. Self-monitoring techniques work because this method requires students to document to their progress. When doing so, students are able to see what they are doing right and understand what they need to do to improve.

4.5 Transition strategies inside and outside of school for students with ADHD

Middle school is a challenge for all students and especially students with ADHD. Junior high school brings high expectations, locker arrangements, need for improved study skills and increased independence. Students at this level also experience a lack of friends and have difficulty with authority figures. Students with ADHD also demonstrate characteristics that display impulsivity, inattention, and hyperactive behaviors. Parent and student self-monitoring techniques can drastically improve the performance of students at this age.

As a future teacher I need to make my students transition to middle school as smooth as possible. To assure that students make a successful transition to middle school I need to incorporate visual schedules in my classroom as well as pre-teach, model and reinforce how to

organize folders, binders, lockers and planners as a means of increasing academic independence. In addition, I plan on teaching lessons that involve social skills, respect, and anger management. In regards to impulsivity, inattention, and hyperactive behaviors, I plan to have students act out appropriate and inappropriate behaviors as a way of teaching friendship and suitable social behavior. Lastly, I plan to collaborate with my students' parents on a regular basis. By doing so, my students' parents and I will be able to communicate with each other and make suggestions concerning how to help their students succeed.

Certain personalities gel better with specific groups of students. I feel I have found my calling at the middle school level. I have a general kinship with these students because I understand and am aware of what they are going through. Also, I have trust and rapport with junior high students due to similar humor and interests. Having the common knowledge and acceptance of students at this grade level will prove to be an interesting and enjoyable professional experience.

4.6 Medical interventions and psychotherapy for students with ADHD

Students with ADHD have been found to experience lack of self-concept and self-support from peers. Studies conclude that medication and psychotherapy improve student behavior, memory and academic performance. In addition, Brupropion SR and counseling can also improve addiction characteristics of individuals with nicotine dependence.

As a future teacher, being aware of the way students feel and the way they are treated by their peers is crucial in terms of teacher success. I need to create a supportive environment that helps students realize their potential while I need to act as a mentor and counselor. This way, my students' will feel comfortable talking to me about their problems triumphs as well as being motivated to be the best that they can be. In addition, I will give students suggestions and advice

that will help them in both academic and social fields. Lastly, to help students become successful in school it is important for teachers to promote and continue to research medication and psychotherapy methods. As a result, I will learn what current supplements and methods are most effective for helping students with ADHD become physically, mentally and academically well.

5. Conclusion

While participating in this metasynthesis I have been enlightened by teacher literature and it's ability to phenomenally improve my teaching strategy. As I completed this project I discovered that middle school students with ADHD are quite similar to their peers in that they all want to be well liked, feel normal, and fit in.

I have learned that the only real difference between students with ADHD compared to students without is that students without ADHD are able to focus on specific tasks and are able to interact with others in a positive manner. I also found out through this research that the most effective way to help students with ADHD is to help them develop a written plans for tasks and to reinforce students by encouraging them to focus on small sequential tasks.

One solution would be teaching students meditation so they would learn how to block out distractions around them so they can concentrate on the task that needs to be completed next. In terms of social problems concerning students with ADHD, I need to be supportive and need to build a strong rapport with students so they feel comfortable discussing social problems and are willing to accept my advise.

Deciding what curriculum to teach and what time of year to teach it can be extremely challenging for inexperienced teachers. I have learned that it is best to plan challenging teaching curriculum mid semester. This is because all student especially students with ADHD struggle when they are distracted by activities that take place outside of school such as holidays or

vacations. By focusing the core of my curriculum mid semester, students will learn more overall and I will need to worry less about holding students accountable for learning material that is taught later in a school semester.

Self-monitoring and parent-monitoring are great learning strategies for students.

Monitoring strategies not only encourage students to keep track of how they are learning but they also demonstrate what areas students can improve in; as parents are involved with monitoring their students performance, they have the ability to understand and experiment with strategies and rewards that will motivate their children. Regular communication between parents, teachers and students, will benefit all parties because everyone will have a clearer understanding of how the student learns.

Lastly, medication and psychotherapy are a large part of the wellness and academic success of student with ADHD. To help my students succeed I am going to build a rapport with my students' parents so I will be able to communicate what is going on at home, what treatment they are receiving or what prescriptions they are taking. If I become successful in communicating with my students' parents I will also be successful in helping their children become better students.

In closing, not only have I benefited from the knowledge from the literature but my future students will be able to improve their overall performance in school as a result of this study. Hopefully through the skills I have developed by completing this metasynthesis I will be able to quickly identify students' strengths and weaknesses so I can efficiently develop plans that will benefit my students.

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