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The Impact of Meditation and Mindfulness in the Elementary Classroom: A Review of Research Literature Across Five Disciplines

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THE IMPACT OF MEDITATION AND MINDFULNESS IN THE
ELEMENTARY CLASSROOM:
A REVIEW OF RESEARCH LITERATURE ACROSS FIVE DISCIPLINES

by

KAYLI ROUTHIER-MARTIN

A thesis submitted in partial fulfillment of the requirements
for the Honors in the Major Program in Education
in the College of Education and Human Performance
and in the Burnett Honors College
at the University of Central Florida
Orlando, Florida

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Thesis Chairs: Sherron Roberts, Ed. D. and Norine Blanch, M.S. Ed.

Abstract

Mindfulness meditation programs, benefits, and outcomes were examined through research previously conducted and published by professionals within five differing disciplines: health and wellness, psychology, elementary education, exceptional education, and medicine. The goal was to find common themes within the differing disciplines in order to gather information about the effectiveness of a mindfulness meditation program to be used in an elementary classroom. In this thesis, the chapter of Health and Wellness is a review of literature that tells the benefits found within meditators, which are not found within non-meditators. The chapter of Psychology explains the social-emotional needs of students, the causes of stress and anxieties amongst students, and the benefits that meditation provides in order to counter the negative effects of stress, anxiety, poverty, etc. The chapter of Elementary Education reviews research literature on the existing mindfulness meditation programs within the United States. This chapter also describes the implementation of such a program in an elementary school, as well as the documented data of the outcomes of the programs. The chapter of Exceptional Education is a review of the research literature on the benefits mindfulness meditation has on students with exceptionalities, such as specific learning disabilities, attention deficit hyperactivity disorder, and autism spectrum disorder. The chapter of Medicine is a retelling of previously published scholarly articles that list the neurological benefits of meditation, and also references the negative side effects to the currently prescribed medications that are being used in the treatment of ADHD.

Dedication

To my current and future students, may you always believe in yourself the way that I believe in you. I want you to know that you possess the strength to achieve whatever it is you set your mind to no matter what obstacles may lay ahead. Bring with you the tools to be patient, mindful, and always kind. With these you will succeed.

To my family and friends, I cannot express into words what your laughter, support and encouragement mean to me. Thank you all for providing a listening ear and an open heart.

Acknowledgments

“There are two kinds of teachers: the kind that fill you with so much quail shot that you can’t move, and the kind that just give you a little prod behind and you jump to the skies.”

– *Robert Frost*

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I am particularly grateful for my incredible thesis chairs, Dr. Sherron Killingsworth Roberts and Mrs. Norine Blanch. Without your guidance, intelligence, expertise, and vision, none of this would have been possible. You were both there when I needed your advice the most, and knew when to let me run with an idea and be the guide to my own learning. Because you believed in me and my goal for this project, I have not only become a well-equipped educator, but a more self-driven and dedicated lifelong learner.

I wish to acknowledge the help and advice given by my wonderful committee, Dr. Cynthia Hutchinson and Dr. Deidre Englehart. Your input has been a great help to the authenticity and credibility of my work. You have both been a source of reassurance throughout this process and

I am filled with gratitude to have you work alongside me on this journey.

A special thank you is extended to my boyfriend, Alexander Edelman, for being my biggest supporter during my entire college career. Your kind and patient spirit alongside your pride in me have truly made this experience unforgettable.

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Chapter One: Introduction

On New Years Day of 2013, I attended my first meditation class hosted by none other than a Tibetan Monk. It was hosted in a relatively busy part of town, in a small clothing boutique. During the meditation I was surprised to find myself becoming more present than distant. At this point, I had been practicing yoga for a few years, and had always lost myself in the calmness of the atmosphere. During this meditation, though, I could feel the movement in the wood floorboards when someone shifted their sitting position. I could hear individual cars on the street instead of the combined rumble. The monk's mantra consumed my body and mind, almost instantly. His mantras and my presence in everything that was going on around me were all I could pay attention to. After the activity, while eating vegan cupcakes, I spoke to one of his advisors. She was ecstatic to hear I'm an education major and told me about a boy on the autism spectrum in the village in Tibet. His parents would drop him off in town while they went to work and he would hang around the temple. At first the monks at the Temple were disturbed by the boy, but soon taught him to meditate. He eventually started coming to the temple to meditate every day and started bettering other aspects of his life. Meditation helped him become more focused and aware of social norms, and some monks were even teaching him how to read. Since this experience, I have become infatuated with the idea that meditation and mindfulness can have an impact in the classroom, specifically for students who struggle with attention disorders or behavioral challenges.

Therefore, this thesis seeks to understand the impact meditation and mindfulness have on students' behavior and their overall achievement in the elementary classroom. This research was

gathered by studying scholarly publications from across the multiple disciplines of Health and Wellness, Psychology, Elementary Education, Exceptional Education, and Medicine.

Chapter Two: Rationale

The National Institute of Mental Health [NIMH] defines attention deficit hyperactivity disorder (ADHD) as, “one of the most common childhood disorders that can continue through adolescence and adulthood. Symptoms include difficulty staying focused and paying attention, difficulty controlling behavior, and hyperactivity” (NIMH, 2015). Since the diagnosis of this disorder, western medicine has created medications that help students stay focused and on task. Although these medications work in keeping students attentive and honed into what the teacher is saying, many medications are too harsh and can fundamentally change one’s behavior, especially if introduced at a young age. *Clinical Evidence Journal* (CEJ) reinforces this point by saying that the drug Atomoxetine, which is used to treat ADHD, “has been associated with decreased appetite, suicidal ideation, depression, liver changes, and seizures”(Keen, 2011, p.3). The cons associated with the medications prescribed to children with ADHD outrageously outweigh the benefits of keeping the students quiet and attentive. A healthier alternative to medicating children is greatly needed.

One of the possible solutions is to introduce meditation and mindfulness to children. Mindfulness can be defined as, “deliberately focusing attention in the present moment, without judgment, to the experience that unfolds” (Waters, Barsky, Ridd & Allen, 2014, p.3). When a student becomes more mindfully aware, he/she can pick up on cues that they associate with zoning out, and can consciously and mindfully become focused on the task at hand. The *International Journal of Psychophysiology* (IJP) describes Transcendental Meditation (TM) technique as a process where the repeated mantras increase awareness. The mantras eventually

go away; leaving the secondary, present reality in focus even while not actively practicing meditation (IJP, 2015).

This thesis is a synthesis of scholarly articles spanning multiple disciplines that explore the effects that meditation and mindfulness have on students' behavior and their overall achievement in the elementary classroom. You will find in the upcoming chapter on Health and Wellness, a broad point of view of the benefits that meditation and mindfulness bring to people who meditate. This will be followed by a chapter on the psychology behind meditation to hone in on the brain waves associated with meditating and the outcomes of how people feel after a meditation session. The chapters on elementary education and exceptional education take the concepts described in the first two chapters and relate the information to students in the elementary classroom and that have special needs. Also, there is mention of currently existing mindfulness programs, which are taking place in schools around the nation. The last chapter, from the discipline of medicine, is an extension to the purpose of this study. The side effects of taking prescribed medications to treat the symptoms of ADHD are listed, as well as the neuroscience behind certain diagnosed learning disabilities, and the neuroscience behind the effect meditating has on the brain.

Chapter Three: Methodology

In order to examine the academic and behavioral effects of meditation and mindfulness in an elementary classroom setting, a multidisciplinary review will be conducted. Examining the effects that meditation has on students, whether in elementary school or college will be conducted first. This research will be pulled from online databases relating to the disciplines of Health and Wellness, Psychology, Elementary Education, Exceptional Education, and Medicine. Subsequently, attention deficit hyperactivity disorder symptoms and treatments are examined, as well as the effects meditation and mindfulness have on academia.

These findings within the multiple disciplines were compared and I came to a consensus of the possible impact that meditation and mindfulness can have in the elementary classroom. This research also contains a subset of information gleaned from this research on how the methods of meditation or mindfulness have been considered to help treat the symptoms of attention deficit hyperactivity disorder compared to prescribed medications.

As I began researching for my topic, I first met with Terrie Sypolt, a research librarian who specializes in research pertaining to education. I first met with her in December 2014 where she showed me how to navigate the UCF library home page and database filter. For a couple of months I navigated through the databases as shown in Figures 1-3. In this time frame, I gathered about 13 articles from across all disciplines I was looking to investigate. However, in my second meeting with her in February 2015, she aided my researching skills by exposing me to new key terms and terminologies, such as, metacognition and specific learning disabilities, that I had not previously thought of on my own, and actually honed in my research so that I could find more articles that related specifically to what I needed.

When I first started typing in my key terms in EBSCOhost I was sometimes pulling up thousands of articles that had anything and everything, and sometimes not so directly related to my research, yet had to do with the key term I put in the search box. I had a distinct method of filtering through this overwhelmingly amount of research by using four main criteria that the article had to follow before I determined to include it in the study by downloading the Portable Document Format (PDF).

1. The article mentioned meditation or mindfulness in the abstract.
2. The article was published within the past 10 years (from 2005-2015) from a reputable source, such as the *Journal of Child and Family Studies*.
3. The article or research had a focus on human subjects, no matter the age, gender, or race.
4. At least some if not all of the research in the article could be related to education. For instance, the article “ADHD in Children and Adolescents” (Keen, 2011) is a medical reference found in the *Journal of Clinical Evidence*. The article is simply a list of tables that describe the purpose for and side effects of medications prescribed to children and adolescents diagnosed with ADHD. Although it may seem irrelevant at first, I used this article to show the need to use meditation as a safer alternative to help treat the symptoms of attention deficit hyperactivity disorder.

The three key terms that stayed consistent throughout all of the disciplines while I was searching within the databases were meditation, mindfulness, and metacognition. This thesis seeks to understand the impact meditation and mindfulness have in the elementary classroom by studying the disciplines of health and wellness, psychology, elementary education, exceptional

education, and medicine. I, therefore, need to keep those three key terms the core of my research and a central common ground between the disciplines I synthesized.

To better understand my process of research, Figures 1-7 will show the specific steps taken to reach the articles used for my research. All sources originated from the University of Central Florida's Article and Database page on the library website. From there I chose my specific discipline to research: elementary education, exceptional education, psychology, health and wellness, or medicine. Most of the time this initial search would send me to EBSCOhost, where I could there narrow the databases once again. In EBSCOhost I narrowed my search to find journal articles published between the dates of 2005-2015. Only one article was found to be outside this parameter, and was published in the *Journal of Black Studies*, "The Effect of Meditation on the Academic Performance of African American College Students" (Hall, 1999). I still chose to include this article because it was the only one that stated how meditation directly affected academic performance, specifically grade point average. Although the article is focused on college-aged students rather than the elementary aged students I am focusing on, the fact that they showed evidence that meditation had a direct impact on academic performance was enough reason to include the article. Once I gathered the articles and journals that I knew I wanted to use for my thesis, I organized them by discipline and topic into Mendeley, a reference and PDF organizer. This way I could highlight, make notes, and add annotations to the articles before citing them in my thesis.

In order to get an idea of the research process for the thesis, I reviewed 11 articles for the proposal portion across the disciplines of elementary education and exceptional education. After my proposal was approved, I went on to review 5 articles per the remaining disciplines of health

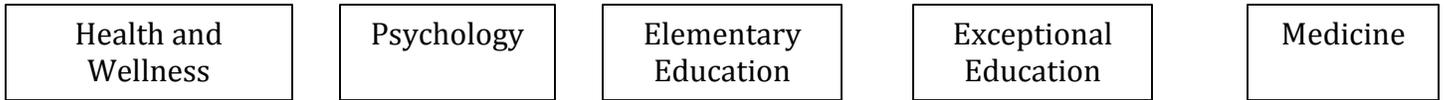
and wellness, psychology, and medicine, thus having a total of 25 articles between five disciplines. Some chapters have references of supplemental resources to clarify definitions or concepts.

Chapters four through eight are the body of the research literature pertaining to each discipline. You will read the literature pertaining to health and wellness first in order to have insight of what mindfulness meditation is, and the benefits long term and short-term meditators experience in particular trials. This will then lead you to the research literature of the discipline of psychology, which builds off of the evidence and research from health and wellness. Only this chapter explains about the brain waves that are activated while a person is meditating. The discipline of psychology also describes the reasons for why people seek meditation as an intervention to their problems. This chapter leads to the discipline of elementary education.

Once you understand the causes of stresses for students as described in the psychology chapter, then you can relate that information to the application of mindfulness meditation in the elementary school classroom. This chapter provides a focus to the research of 3 meditation programs, which are already being implemented in schools across the United States, as well as the research found from authors Waters, Barsky, Ridd, and Allen on the impact of 15 other meditation programs in the United States. The chapter of elementary education is followed by the research literature from the discipline of exceptional education. After learning about meditation programs in schools, this section deepens the findings to support how the methods help students with learning disabilities, attention deficit hyperactivity disorder, and autism spectrum disorder. The last discipline you will read, is the research literature pertaining to medicine. This chapter seeks to showcase the evidence to support my rationale for writing this

thesis. In this chapter you will find information on how current prescribed medications that treat ADHD effect peoples bodies and potential side effects to these medications. The neuroscience behind mindfulness meditation is also provided and explains the benefits of using mindfulness meditation as an alternative to prescribed medications to help treat the symptoms of ADHD.

Figure 1: Literature map of the disciplines used to examine meditation & mindfulness



Key Ideas:

- Meditation/ Mindfulness
- Academic Achievement
- Attention Deficit Hyperactivity Disorder
- Alternative Medicine
- Relaxation Therapy
- Quantitative Data: Meditating increases GPA
- Qualitative Data: Meditating makes urban youth feel calm and more motivated to learn.
- Medication prescribed to students with ADHD has side effects such as seizures and depression.
- Types of meditation such as Transcendental-Sidhi.
- Meditation and mindfulness programs used in elementary schools.
- Treatment
- Atomoxetine/Methylphenidate
- Metacognition
- Pervasive developmental disorders
- Special Education

Major Issues:

- The need for an alternative treatment for elementary students diagnosed with attention deficit hyperactivity disorder.
- The need for non-invasive treatments to improve behavior for students diagnosed with attention deficit hyperactivity disorder.
- Increasing metacognition in students during a time where critical thinking skills are crucial to be successful.
- Methods to help students in urban neighborhoods to find relaxation and a place to feel calm.
- Methods to promote self-monitoring and focusing skills for students to be academically successful.

Key Sources:

- PsychInfo Database
- ERIC Database
- Cochrane Database
- Medline Database
- Education Full Text
- Science Direct
- National Institute of Mental Health
- Clinical Evidence Journal
- International Journal of Psychophysiology
- Journal of Positive Psychology
- Journal of Child and Family Studies
- Journal of Child and Adolescent Psychiatric Clinics of North America
- Journal of Consciousness and Cognition
- Journal of Educational Psychology Review
- Journal of Alternative and Complimentary Medicine.

Chapter Four: Review of the Research Literature Related to Health and Wellness

The purpose of this section is to introduce the benefits of meditation as witnessed by health professionals and experienced meditators. Other sections in this thesis have perspectives related to the benefits of mindfulness or meditation with people with learning disabilities, in regard to education, to neuroscience, and the outcomes of meditation seen from the perspectives of psychologists. The results found in this health and wellness section are taken from trials comparing long-term meditators to non-meditators, and briefly trained meditators to non-meditators. These trials and results have been published in clinical journals, such as *Consciousness and Cognition* and *Cognitive Therapy and Research*. The authors of these articles do not have a bias towards education; however the results do match research that has an educational influence. For the purposes of this thesis, information from five disciplines will be explored to determine the usefulness of meditation or mindfulness in the elementary classroom.

Therefore, even though the study “Mindfulness meditation improves cognition: Evidence of brief mental training” (Zeidan et al., 2010) was conducted on college-aged students, the findings are promising to help younger people who are struggling to access working memory as well. The study examined the cognitive abilities of 49 non-meditators before prepping 24 subjects to a brief mindfulness meditation training, while the remaining 25 participants received no training, and were still considered non-meditators. The training lasted for four days, with meditation occurring only 20 minutes per day. The trainer, a facilitator with ten years of meditation experience, had the meditation group first focus on their breath at the tip of their nose and “if a random thought arose, they were told to passively notice and acknowledge the thought and to simply let ‘it’ go, by bringing the attention back to the sensations of the breath” (Zeidan et

al., 2010, p. 599). The training then moved on to the meditators focusing on the breath from their nose to the way it felt on their back while inhaling. This technique would make the meditator more aware about their surroundings and more focused to minute details. The cognitive abilities of both groups were examined again after the training. “The meditation group exhibited a significantly greater number of processing runs involving accurate and sustained working memory discriminations. The meditators were able to maintain focus and accurately retrieve information from working memory under conditions that require more rapid stimulus processing” (Zeidan et al., 2010, p. 603). Educators are trained to use repetition and multiple exposures of new information with students to encourage foreign information to move from working memory into long-term memory. According to this study by Zeidan and fellow colleagues, mindfulness and meditation has the power to enhance student’s achievement, not only in the short term, but also in the long-term.

Comparatively, an article published in the *Journal of Cognitive Therapy and Research* in 2012 studied the impact meditation has on long-term memory in participants who have spent years studying and practicing mindfulness meditation. The article, *Performance-based tests of attention and memory in long-term mindfulness meditators and demographically matched nonmeditators* (Lykins, Baer, & Gottlob, 2012) compares to the study done by Zeidan, Johnson, Diamond, David, & Goolkasian in that trained meditators were compared to non-meditators. Lykins (2012) used a sample of 33 adults who were trained meditators and 33 adults who classified as nonmeditators. Although the conductors tested multiple factors such as attention, memory functioning, elaborative processing, and short- and long-term memory, the study concludes by stating “The only significant group differences were in short-term memory and

long-term memory” (Lykins, Baer & Gottlob, 2012, p. 103). This information is not to say that the meditators scored low in their cognitive abilities; it just so happened that there was no significance between both groups scores. However, significance was found between the short-term memory scores, specifically short delayed free recall, and cued recall “meditators scored significantly higher on two measures of short-term memory” (Lykins, Baer & Gottlob, 2012, p. 110). Although these outcomes were with adults, more research might focus on an elementary classroom when facilitating a class discussion or giving an oral test. With this data in mind, perhaps the student who is trained in meditation will respond faster when asked a question about recalling events and when they are prompted to give a correct answer. This study also researched whether or not accuracy to an oral answer was compromised for speed, “these results...provide no indication of a speed/accuracy trade off” (Lykins, Baer & Gottlob, 2012, p. 111). It was however noted that meditators were slightly slower, but more accurate on continuous performance tasks.

Another study was conducted with adult participants from a local Buddhist center, who are well rehearsed in meditation; these members were then compared against participants who classified as nonmeditators. Moore and Malinowski (2009) investigated whether or not long term meditation training had an impact on the participants’ answers to the questionnaire, Kentucky Inventory of Mindfulness Skills (KIMS) which consisted of four subscales: observing, describing, acting with awareness, and accepting without judgment (Moore & Malinowski, 2009). The study concluded, “Meditators showed higher levels of mindfulness, better attentional performance and higher cognitive flexibility” (Moore & Malinowski, 2009, p. 184). Cognitive flexibility is defined by The Center on Brain Injury Research and Training (CBIRT) as a way to

interpret information in multiple ways, to change approaches, or to select a new strategy if the first one is not working (Meltzer, Pollica, & Barzillani 2007). Cognitive flexibility is a skill set that is important for people to be able to think critically and to problem solve effectively. Meditation is one tool to use to help increase cognitive flexibility. The authors conclude their research by saying “Meditators performed significantly better than non-meditators on all measures of attention. Furthermore, self-reported mindfulness was higher in [experienced] meditators than non-meditators and correlations with all attention measures were of moderate to high strength” (Moore & Malinowski, 2009, p. 182). This is yet another study which shows how being mindful by meditating can increase attentiveness and focus.

Additionally, the article “Meditation and Mindfulness in Clinical Practice” (Simkin & Black, 2014) suggests that body adjustments will have a greater impact on your ability to meditate or achieve mindfulness. These methods include, “Posture, Breathing, Attention, and Visualization. Posture assists with body management. Breathing helps calm participants in preparation for ‘brainstorming or free writing’. Attention develops recall, and Visualization helps with imagination”. (Simkin & Black, 2014, p. 499-500). I immediately related this information to an elementary classroom. It would be a simple task to remind students to adjust their posture, focus on breathing, pay attention to what is happening in the present moment, and visualize what you want to accomplish. As an educator, one goal is to have students be aware of what is happening and be able to visualize or predict what will happen next, particularly when discussing a piece of text or literature. Simkin and Black even mention how to help children understand these concepts. “Methods for Posture for elementary school ages include imagining a thread holding you up” (Simkin & Black, 2014, p. 500). I am happy that the authors included these

suggestions and tips on how to easily relate these methods to children and have them understand what is asked of them. Included also are different ways to teach students how to breath properly to help get into a meditative state as well as how to promote the methods of attention and visualization, “Methods for Breathing include alternating inhaling and exhaling, slowly and quickly. To train for Attention, I suggest playing concentration games with children. Finally, for Visualization use guided imagery” (Simkin & Black, 2014, p. 500). All of the methods and ways to show these methods can be easily grasped by elementary children of all ages. I personally would use these methods in specific curriculum like reading or writing. The methods coincide with good reading habits and enforce critical thinking skills.

Most of the articles mentioned throughout this thesis use or talk about Transcendental Meditation (TM) or Vipassana Meditation, where the purpose of meditating is primarily focused on the improvement of the self. This contrasts to another method of meditating, Kindness-Based Meditation (KBM), which has a focus of showing compassion to others.

Traditional (Loving-Kindness Meditation) LKM advocates the following structured approach: directing caring feelings toward oneself, then toward loved ones, then toward acquaintances, then toward strangers, then toward someone with whom one experiences interpersonal difficulties, and finally toward all beings without distinction (Galante, Galante, Bekkers et al., 2014, p. 1101-1102).

The purpose for meditating this way is to not better yourself, but also to better the ones around you. Of course, starting with the one person you have the most control over, yourself. This method has an outward approach where the love and kindness starts from within and will end with the people who need love and compassion the most. This method of meditating will align

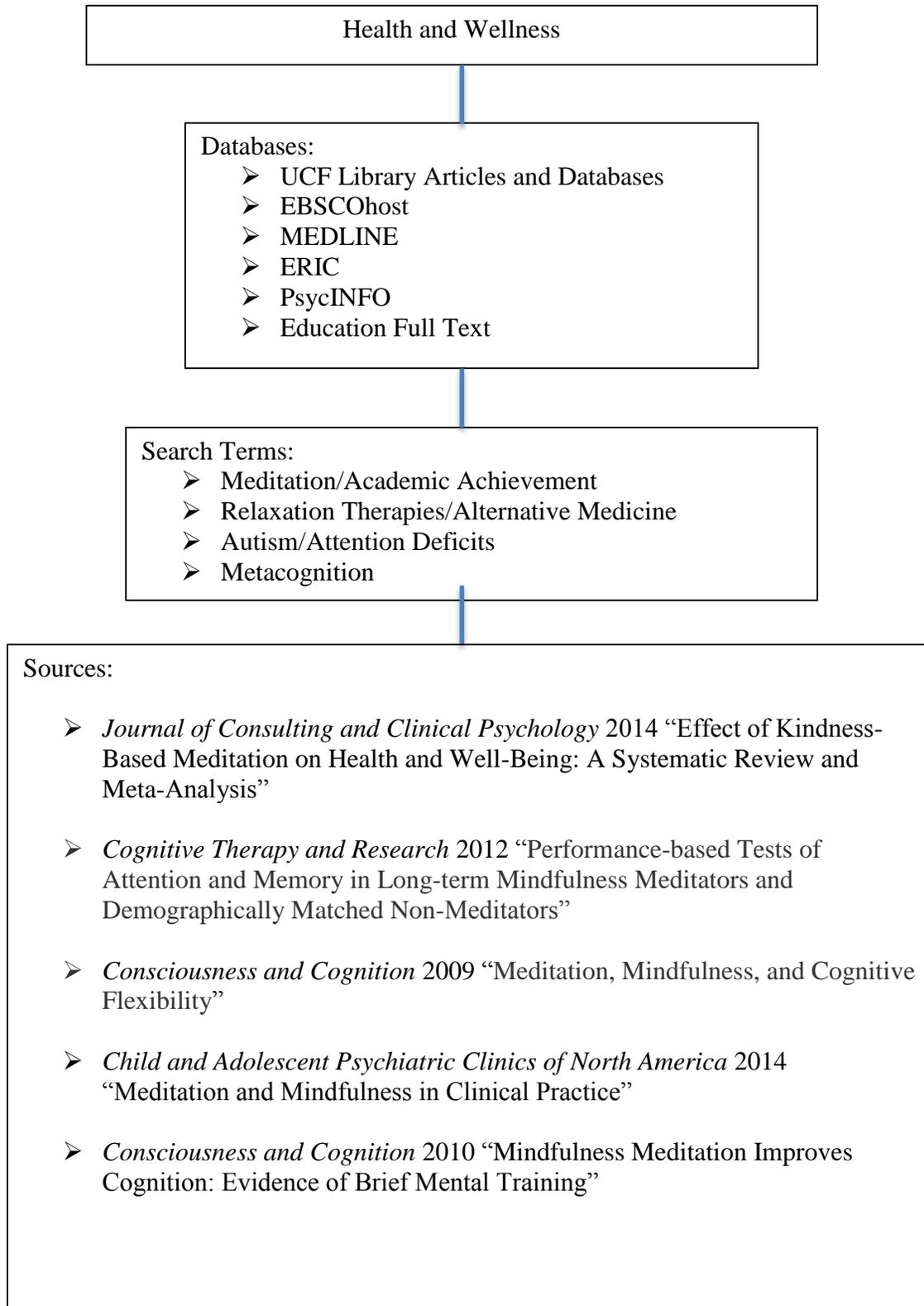
with a lot of anti-bully movements that have been springing up recently, and can not only create more attentive and respectful students, but a classroom environment that welcomes and shows compassion to all. However, it is not expected for students to grasp these concepts and be willing to adapt this lifestyle within the nine months they are in one teacher's classroom. This set up would probably be best suited in a school where the program is site wide, and every student, parent, teacher and staff are on the same page with the same goal. Some of the strategies to become a kindness based meditator included, showing forgiveness, being compassionate, weekly meditation practices, practicing self-compassion, and discussing healthy habits (Galante, Galante, Bekkers et al., 2014). The strategies listed on how to meditate contrast to other methods that have been mentioned. The main difference here is that there is a need to complete the action with other people. Breathing exercises, fixing postures, and creating mantras which are the basis of TM, are personal actions that affect the person doing the action. Therefore, these actions would not be good techniques to promote showing kindness and giving a loving environment inclusive of all people, as is the goal of LKM.

The KBM program did include weekly meditation practices solely to reaffirm the self and for the individual to get back to loving themselves and showing self-compassion. All other methods are showing love and compassion to other people. This can be done in a number of ways like helping someone, giving a compliment, or standing up for a friend. These are all goals that educators want to instill in their students. There is no better way to make sure they uphold these values than to teach them and make their practice part of the everyday routine.

The upcoming chapter of the research literature of psychology will go further to explain the brain waves that are activated while a person is meditating, which will describe the physical

component of why the meditators feel and act a certain way that is different from the non-meditators.

Figure 2: Health and Wellness Literature Map



Health and Wellness Articles

- Galante, J., Galante, I., Bekkers, M.-J., & Gallacher, J. (2014). Effect of Kindness-Based Meditation on Health and Well-Being: A Systematic Review and Meta-Analysis. *Journal of Consulting and Clinical Psychology*. American Psychological Association.
- Lykins, E. L. B., Baer, R. A., & Gottlob, L. R. (2012). Performance-based tests of attention and memory in long-term mindfulness meditators and demographically matched nonmeditators. *Cognitive Therapy and Research*, 36(1), 103-114.
- Moore, A., & Malinowski, P. (2009). Meditation, mindfulness and cognitive flexibility. *Consciousness and Cognition*, 18(1), 176-186.
- Simkin, D. R., & Black, N. B. (2014). Meditation and mindfulness in clinical practice. *Child and Adolescent Psychiatric Clinics of North America*. W.B. Saunders.
- Zeidan, F., Johnson, S. K., Diamond, B. J., David, Z., & Goolkasian, P. (2010). Mindfulness meditation improves cognition: Evidence of brief mental training. *Consciousness and Cognition*, 19(2), 597-605.

Health and Wellness Supplemental Resources

Meltzer, L., Sales Pollica, L., Barzillai, M., (2007). Executive Function in the Classroom
in Executive Function in Education: From Theory to Practice, Lynn Meltzer Ed. New
York: Guilford Press. Retrieved from www.cbirt.org

Chapter Five: Review of the Research Literature Related to Psychology

For the purposes of this thesis, articles related to the discipline of psychology came from reputable scholarly articles from psychology journals and pertain to the effects meditation and mindfulness have on a person's brain waves, as well as their outlook and attitude on life. While the articles related to medicine relate more towards neuroscience and the effects prescribed medications have on humans. People who meditate say that the act of meditation brings them to a different level of consciousness than what is usually experienced in the every day. Meditation is defined as "an exercise during which the individual enters an extended state of contemplation and reflection over a specific subject or their general existence, sometimes with a view to attain a differing state of consciousness" (Psychology Dictionary, 2015). Thankfully with present day technology, we do not have to just take meditators word for it that they are knowingly altering their levels of consciousness. Travis (2011) published an article containing the electroencephalogram (EEG) scans of a brains exact low-resolution brain electromagnetic tomography (eLORETA) patterns. Doctors have captured and studied the electrical currents and brain waves that occur while someone is in the practice of TM. "The description of sanyama [the simultaneous experience of fixity, transcending, and pure consciousness] includes specificity or content, which has been associated with beta1 EEG, and transcending or changing levels of consciousness, which has been associated with alpha1 activity" (Travis, 2011, p. 202). Therefore, alpha and beta brain waves were activated when a person was meditating. These brain waves show that there was a change in levels of consciousness, which is the purpose and goal of TM.

It is not enough to know which brain waves are activated during meditation. It is important to understand how we behave when a particular brain wave is present. "Alpha brain

waves are most present in a wakeful state that is characterized by a relaxed and effortless alertness. Alpha states have been described variously as sublime, flying, floating, lightness, peace, and tranquility” (Biocybernet Institute, 2015). This description of alpha waves coincides with the description of what people feel while they are meditating. The correlation is not surprising, since the EEG scans show an increase of alpha waves when the subject was practicing TM. Alongside alpha waves, beta waves, specifically beta1 waves were detected on the EEG and are described by brainworksneurotherapy.com as, “The brainwaves that dominate our waking state of consciousness when working towards cognitive tasks and the outside world...Low Beta (Beta1) can be thought of as ‘fast idle’, or musing” (Brainworks, 2015). When looking back at the brain scans, it is important to not only recognize what waves are present during meditation, but also which parts of the brain are being activated. In the currently discussed psychophysiology study:

The eLORETA analysis identified sources of alpha1 EEG in right sub-cortical and temporal cortices—parahippocampus gyrus, fusiform gyrus, lingual gyrus, and inferior and medial temporal lobes. These structures are associated with object recognition, face and body recognition, word recognition, memory encoding, and retrieval of objects and scenes (Travis, 2011, pg. 201).

This evidence supports using TM in the classroom, because its practice naturally enhances students’ ability to recall information and to encode new knowledge. Although brainworks.com defines delta and theta brainwaves as the ones associated with deep meditation and dreamless sleep, the purpose of using meditation in the classroom is to make the students more aware and attentive to the upcoming tasks. TM activates alpha and beta waves, which are better suited for

attentiveness and relaxation.

Meditation is an activity to include in the classroom that promotes attentiveness and relaxation, but also, encourages and fosters mindfulness. When students are mindful of what they are feeling and thinking, they can acknowledge and solve problems in a healthy way. Defined in the article *Being Present at School*, mindfulness is “different than psychotherapy, because mindfulness is not about changing one’s thoughts or experiences, but instead about being aware of thoughts and feelings as they flow without being reactive” (Bostic, et al., 2015, p. 245). Educators would not use meditation to change a student’s experience or to tell them how to think, rather to teach how to acknowledge and be mindful of what is happening around them. This is an important skill to use inside and outside of the classroom, especially for students who have learning disabilities, social anxieties, or come from low social economic status, which can cause stresses on the students every day life. An article published in the *Journal of Applied School Psychology* (Frank, Bose & Schrobenhauser-Clonan, 2014) found that when using a school-based yoga program to promote stress coping strategies, the activities “helped youth develop essential emotion regulation skills that can be applied across contexts. These simple practices have been found to reduce stress and tension, dissipate excess energy, relieve tiredness, and strengthen children’s attention span concentration” (Frank, Bose & Schrobenhauser-Clonan, 2014, p. 34). This evidence shows more support for the many reasons why mindfulness meditation is an important skill to teach students in the every day elementary classroom. Similarly, Bostic, Nevarez, Potter, Prince, Benningfield, and Aguirre, the authors of *Being Present at School* (2015) concluded, “mindfulness-based interventions in school settings hold promise, particularly in relation to improving cognitive performance and resilience to stress”

(Bostic, et al., p. 248). For the study conducted by Bostic et al (2015), a pre and post survey was issued to students before mindfulness training and after mindfulness training on how they reacted while they were feeling anxious. In the pre survey student's responses were "This is bad, I will always get anxious, this is awful, this will never end, and asking themselves 'what is wrong with me?'" (Bostic, Nevarez, Potter, et al., 2015, p. 247). The responses show the students getting increasingly anxious and causing that "closing in" feeling that they will be trapped within their anxiety, which they believe is their fault. However, after the mindfulness training the students were asked again to describe how they were feeling when they were becoming anxious. They responded, "My heart is racing, my palms are sweating, I am breathing faster, my thoughts are racing, and I feel hot" (Bostic, Nevarez, Potter et al., 2015, p. 247). The difference in the responses is clear. Before the mindfulness training, the student's were freaking out and blaming themselves for the anxiety and getting wrapped up in what they were feeling, creating an ongoing downward spiral. This contrasts to after the training where the students learned to acknowledge what was happening to them and could find comfort in staying calm and describing the outside effects of the anxiety, removing the blame from an inside source.

When researching the outcomes of the mindfulness based intervention (MBI) named Move-Into-Learning, Dr. Maryanna Klatt discovered the benefits of reducing stresses that are common in children of poverty, "Stress prevention/reduction interventions embedded into school curricula can help children improve self-esteem, increase concentration, decrease behavior problems, and improve academic performance" (Klatt, Harpster, Browne et al., 2013, p. 233). The goal of most educators is to foster a love for learning. Finding joy in the classroom is difficult if the student is sitting stationary for hours at a time with only the thoughts of their

anxieties clouding their mind. Incorporating movement with mindfulness training will engage students, raise their endorphins, and make them feel safe and happy in their classroom. This is why mindfulness is only one element of the Move-Into-Learning curriculum. The goal of the program is to “(1) provide organized movement with emphasis on body awareness, rhythm, and coordination, (2) encourage relaxation and mindfulness, and (3) encourage self-expression through art” (Klatt, Harpster, Browne et al., 2013, p. 234). The program goes on to make a point that the inclusion of music is to energize the students and then relax them. If students are zoning out then they are already in a relaxed state. The purpose is to engage students to be more attentive. Playing music will activate their energy levels, and then including yoga movements will relax the muscles at the same time as engaging mind and body. This is one teacher’s comment on how the Move-Into-Learning curriculum impacted her classroom:

As soon as that music turned on, everything just stopped. You could hear a pin drop, it was amazing. The music was critical; it was a good start to the day, it started everything out calmly. The music determined the pace of the movement, and the movement seemed to relax the children so that they could focus on what I was trying to teach them next (Klatt, Harpster, Browne et al., 2013, p. 238).

The music and yoga movements are ways to help students feel less stressed and feel more attentive once the action is completed. The mindfulness portion is the key to giving the students an open mind to what is occurring in the present moment. Again, the purpose of mindfulness is not to have the students forget or repress their stresses, but to acknowledge their presence, yet choose to focus on schoolwork.

It should be noted that mindfulness and meditation would not cure anyone of anxiety, so

that they never feel anxious again. Moreover, the training and practice help people cope with how they deal with outside occurrences and situations beyond or even within their control. The training can also be beneficial to help students in test preparations and methods to be better test takers. In this day and age with high stakes testing, our students can definitely benefit from feeling less anxious about a test score. Mindfulness training is one way to help reduce anxiety and clear their mind. Napoli (2008) studied students in a classroom where the teacher promoted mindfulness training, “They were better able to focus and relax, reduce anxiety before taking a test, make better decisions when in conflict, and were more easily able to redirect their attention when off-task” (Napoli, Krech & Holley, 2008, p. 103). One of the keys here is that the students were able to redirect themselves when they noticed they were off task. This was self-directed and without the prompting of a teacher. This not only ensures students stay focused in the classroom during a lesson, but also focused while taking an individual test. Still, mindfulness has been shown to decrease “binge eating, numbness/avoidance in posttraumatic stress disorder, chronic pain, stress levels, and even blood pressure” (Bostic, et al., 2015, p.247). These outcomes appear preferred over the side effects to the alternative route of taking prescribed ADHD medications, eating disorders, and the side effects associated with popular medications, such as Ritalin. An important point for educators to remember is that using mindfulness strategies in the classroom will help some students. Whether they are diagnosed with ADHD or not, or if they are and are already prescribed medication to alleviate hyperactive symptoms, mindfulness training through meditation can combat some of the side effects to the medication.

A study by Bostic and colleagues (2015) also showed more evidence to support the use of mindfulness meditation in the classroom to help students with ADHD, autism, and other learning

disabilities (LD). “In individuals with autism spectrum disorder, studies showed improvements in social interactions and impulsive behavior, and decreases in aggression...Patients with ADHD showed improvements in hyperactivity symptoms and significant changes in neurocognitive measures. A study of mindfulness in adolescents with LD and anxiety showed significant differences in anxiety and social skills, and academic achievement” (Bostic, et al., 2015, p. 248). Certainly, learning social skills can be considered just as important to learn in school as any other content or curriculum. This is especially true for students who have social anxieties, learning disabilities, or other struggles that could prove to have negative outcomes in social settings without guidance. Teaching these students, alongside every student in the classroom to be mindful about every situation they encounter, will not only ensure academic metacognition, but also promote a safe and welcoming classroom environment, which will reflect on the way they treat and act around others outside of the classroom.

Most believe that students with autism spectrum disorder benefit from sticking to a set routine. They often feel more comfortable when they know what to expect and may become disorientated or confused when not properly warned about a schedule change. Mindfulness has been found to enact the same behaviors, as when following a habit or routine, however, the difference is that a mindful person can enjoy the comfort of habit even when the routine is changed. “The same behaviors resulting from habits, mindsets, and other routines may be enacted when in a mindful state; however, these routines are now available for revision if the situation warrants” (Napoli, Krech & Holley, 2008, p. 102). This information is essential to an educator who may have a student with autism in the classroom. As most educators are aware, there are some occurrences that change the classroom without warning and could never be

planned for. These instances may upset a student who is on spectrum, if the student has a mindful mind, they may be more perceptive to accepting the change. Napoli continues to say “mindfulness can be defined as a personality trait where one has the propensity to be open to novelty, attentive to distinctions, sensitive to context, aware of multiple perspectives and oriented in the present” (Napoli, Krech & Holley, 2008, p. 102). By creating an environment with introductions to multiple perspectives and open mindedness, it is possible that the effects will help a student with autism more easily cope with a change in routine.

Although there are many benefits to incorporating mindfulness into the curriculum, promoting meditation to the public elementary school classroom often bring innocently concerned parents, as well as naysayers to the discussion. The teacher should be well prepared to answer these questions and come with a defense as to why the practice is important to include in their daily routine.

Some of the potential obstacles include: “Perceptions that the program competes with religious principles, competition with other academic priorities, feasibility, safety, age appropriateness, and retention” (Bostic, et al., 2015, p. 253). In regards to concern about religious principles, education for parents, staff, and students is key. Inform parents and staff of the nature of using the practice, as well as provide sample lessons to show that religion is not the focus of the teachings, and that the practice ties in to promoting metacognition and mindfulness to what content is being taught. This conversation can also tie in to explaining that teaching meditation and mindfulness does not eat up into other curriculums, because they are intertwined, and the plan to teach mindfulness is to help students retain subject area material in a more meaningful way.

For example, if there is a program that uses yoga or martial arts to promote mindfulness, it can be included as promoting health or physical education inside of the classroom. When faced with a concern about how exactly the program will be implemented and delivered, it is crucial to be well prepared in showing lessons of proposed programs, and how they have been implemented at other locations. Try and form a committee to help form a plan that will work for your specific school and students. It is understandable for parents to question the safety and age appropriateness of the program within an everyday classroom setting. One can eliminate postures that may be too difficult or too vulnerable to risk, also providing descriptors and examples of how to properly do the pose to eliminate confusion and awkwardness. Also, teachers should inform the school nurse of the program and tell them about potential aches that may occur with some yoga and martial arts postures.

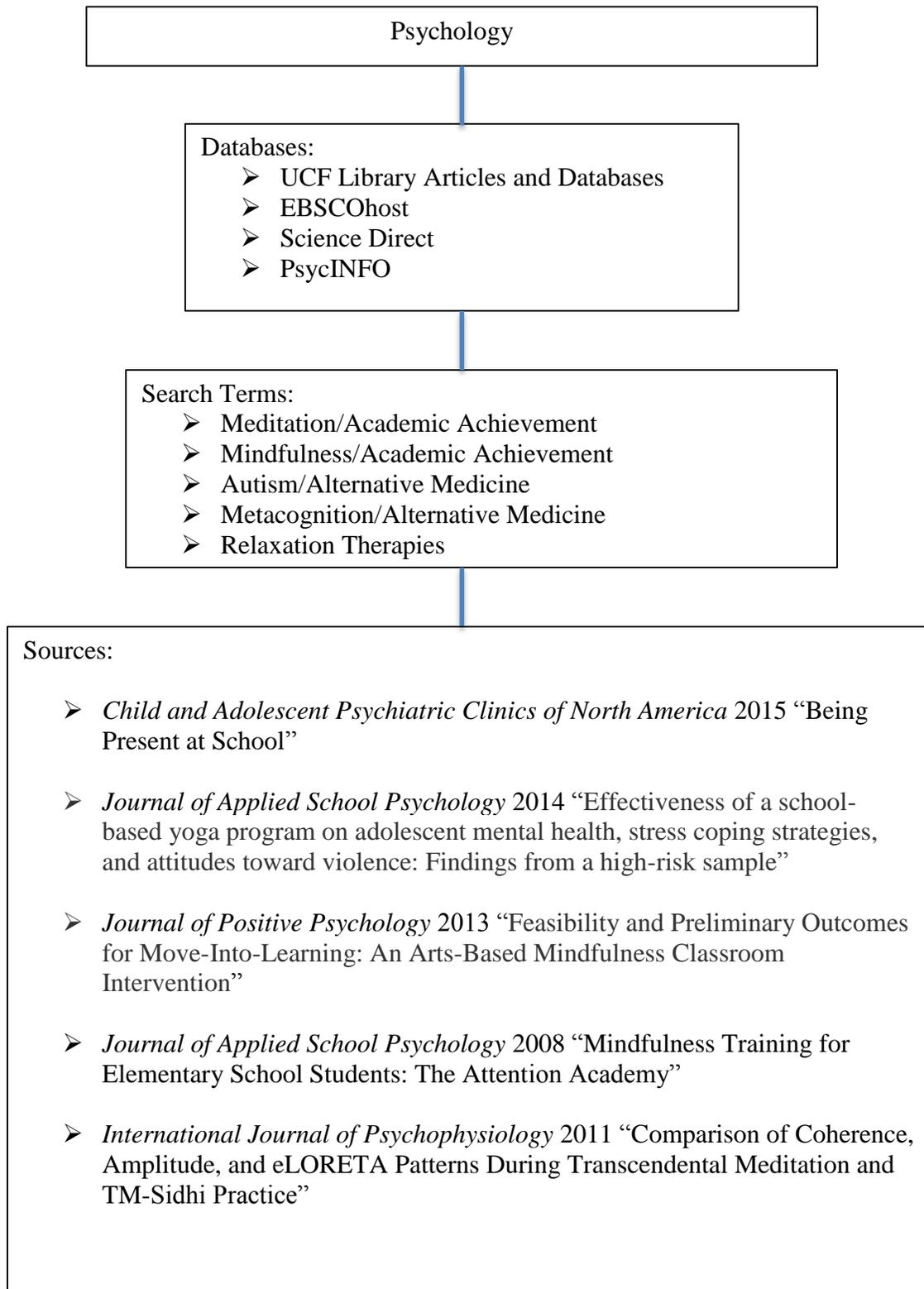
Another task that will be crucial for the teacher is to ensure that your students become engaged and actually want to become mindful through meditation. Using reinforcements or rewards is a good strategy to promote the program, as well as allowing make-ups for students who were absent and want to learn the new skill (Bostic, et al., 2015, p. 253). With obstacles inevitable, it is crucial for the teacher to be well versed and well prepared to be able to overcome these roadblocks, and at the end of the day do what s/he feels best for the students.

Most of the programs that teach mindfulness in schools use meditation, yoga, or martial arts as the catalyst to engage students and keep them motivated to learn how to be mindful. To some onlookers, it may seem strange to use an exercise to engage and transform a mental state of mind. However, according to the authors of *Effectiveness of a School-Based Yoga Program on Adolescent Mental Health, Stress Coping Strategies, and Attitudes Toward Violence: Findings*

From a High-Risk Sample say that although misunderstood, the motions are necessary to promote mindfulness training. “Although the mechanisms of action are not fully understood, it appears that yoga and meditative practices evoke a calming effect, which helps students get into a frame of mind conducive to learning and distinctive from the effects of physical exercise alone” (Frank, Bose & Schrobenauser-Clonan, 2014, p. 34). Although benefits to being active in the classroom are numerous, the use of yoga poses or the flow of martial arts is intended to calm students and activate them to become mindful, not just to get a little exercise. Yoga exercises would not replace the need for physical education held during specials or other designated parts of the students’ day, nor should it replace recess time or other designated times that students spend outdoors. These meditation techniques are to be used within the walls of the classroom at the beginning of the day, or for a couple minutes as a transition throughout the day between subjects, or for students when they are feeling restless and need a short break to regroup.

In the following chapter of the research literature of elementary education, you will find how these benefits of mindfulness meditation can help students cope with their every day stresses when the teacher implements meditation practices as an in school intervention.

Figure 3: Psychology Literature Map



Psychology Articles

- Bostic, J. Q., Nevarez, M. D., Potter, M. P., Prince, J. B., Benningfield, M. M., & Aguirre, B. A. (2015). Being present at school. *Child and Adolescent Psychiatric Clinics of North America*, 24(2), 245-259.
- Frank, J. L., Bose, B., & Schrobenhauser-Clonan, A. (2014). Effectiveness of a school-based yoga program on adolescent mental health, stress coping strategies, and attitudes toward violence: Findings from a high-risk sample. *Journal of Applied School Psychology*, 30(1), 29-49.
- Klatt, M., Harpster, K., Browne, E., White, S., & Case-Smith, J. (2013). Feasibility and preliminary outcomes for Move-Into-Learning: An arts-based mindfulness classroom intervention. *Journal of Positive Psychology*, 8(3), 233-241.
- Napoli, M., Krech, P. R., & Holley, L. C. (2005). Mindfulness training for elementary school students: The attention academy. *Journal of Applied School Psychology*, 21(1), 99-125.
- Travis, F. (2011). Comparison of coherence, amplitude, and eLORETA patterns during Transcendental Meditation and TM-Sidhi practice. *International Journal of Psychophysiology*, 81(3), 198-202.

Psychology Supplemental Resources

Alpha Brain Waves. (n.d.). Retrieved from www.biocybernaut.com. Retrieved July 13, 2015.

What are Brainwaves? (n.d.). Retrieved from www.brainworksneurotherapy.com. Retrieved July 13, 2015.

What is meditation? Definition of meditation (Psychology Dictionary). (n.d.). Retrieved from www.psychologydictionary.org Retrieved July 13, 2015.

Chapter Six: Review of the Research Literature Related to Elementary Education

Since this thesis seeks to understand how meditation impacts the academic performance and behavior of students in an elementary classroom, I first need to review what existing literature has to say about the use of meditation and mindfulness in an elementary classroom setting. It was very astounding for me to read in “Mindfulness Training and Classroom Behavior Among Lower-Income and Ethnic Minority Elementary School Children” (Black & Fernando, 2013) that there already exists a five-week long mindfulness program in a Richmond, California public elementary school using the Mindful Schools curriculum. Their website provides an example of an introductory lesson to mindfulness. The first step was the instructor using a vibratone to create a mellow mantra. Another activity was to have the students sit still and close their eyes for one minute to activate mindful bodies. “The Mindful Schools (MS) curriculum was delivered to students in 15-minute sessions running three times per week for a total of five weeks. MS included the MS curriculum plus additional once-weekly classes for 15 minutes for a total of seven weeks (in total, 12 weeks of intervention)” (Black & Fernando, 2013, p.2).

The biggest take away was how this school implemented the program. It wasn't time intrusive or demanding. It only took 45 minutes per week of mindfulness training for the students and teachers to see drastic results in terms of student attention, self-control, participation, and respect. Although I would have liked to see the researchers examine the direct impact the program had on students academic achievement, we can surmise from the outcomes of this study that the students higher levels of attention, participation, and self-control might lead them to do better on their classwork, homework, and test grades. The data gathered from Black and Fernando (2013) reveal in numbers ranging from a Low 1.0 to High 4.0 on the Student Behavior

Rubric by Kinder Associates, that the programs results indicated students increase their attention level from a 2.6 all the way to a 3.0, self-control from a 2.8 to a 3.2, participation from a 3.0 to a 3.2, and the students respect scores went from a 3.0 to a 3.2 (Black & Fernando, 2013, p.4).

Without a doubt the mindfulness program positively impacted student behavior and focus in this school. The use of meditation techniques and mindfulness training, combined with effort and lessons on metacognition, the student's behaviors improved. Not only in regards to their attitudes and respects, but also their desire to pay attention and focus on the tasks at hand.

In addition to researching the effects of the Mindfulness School curriculum, I found a second program that involved elementary aged students. However, instead of a school-wide initiative, 97 fourth and fifth graders from four different public elementary schools, volunteered to be a part of a 12-week yoga-inspired mindfulness intervention developed by the Holistic Life Foundation, Inc. The students that participated in this program were urban youth who were exposed to stressful home-lives and had depressive and/or aggressive behaviors (Gould, Dariotis, Mendelson & Greenberg, 2010). The intervention didn't disrupt class time since an instructor came directly to one of the four schools and pulled the children during the time the students went to specials: music, PE, drama, art, etc. Similar to an exercise the children might see at PE, they practiced "breathing techniques, yoga-inspired postures and movement series, including bending, stretching, and fluid movement, as well as mindful breathing" (Gould, Dariotis, Mendelson & Greenberg, 2010, p.973). In comparison to the Mindfulness School curriculum (Black & Fernando, 2013), the Holistic Life Foundation took a more active approach to the students' meditation and mental awareness. For these select students it raised their confidence to be a part of a select group to receive special instruction in yoga meditation. At the end of each class the

students “lay on their backs with their eyes closed while the instructors guided them through a mindfulness practice, such as paying attention to each breath or sending out positive energy to others” (Gould, Dariotis, Mendelson & Greenberg, 2010, p.973). The last component is what leaves the students with the greatest impact, especially coming from rough backgrounds where universal love may not always be shared or expressed. Some of these students were facing anger management problems and depressive behaviors. Allowing them time during the day to relax, clear their minds, and be positive towards one another had a tremendous impact on their social well-being, and ideally their academic performances will increase because of it. The study concludes that youth who started the study with low to medium levels of depressive symptoms reduced involuntary engagement stress responses at the same rate as students who did not take part of the program. However, these same students who took part of the intervention had a reduction in their impulsive action stress responses compared to those who did not take part of the intervention at all (Gould, Dariotis, Mendelson & Greenberg, 2010). Students with low-medium depressive symptoms had a positive outcome from the program but the youth with higher levels of depressive symptoms need a more intense intervention to help them. All in all, the 12-week program helped most students with depressive symptoms find a way to cope and relax when in a stressful environment.

The two programs that I mentioned are not the only programs or interventions that have been studied and implemented into public schools. Reviewing all of the individual meditation and mindfulness programs that have existed is not the purpose of this thesis, yet, thankfully was the purpose of a review already conducted. In 2014, The Educational Psychology Review Journal featured a 32-page review of 15 different meditation and mindfulness programs held in

public schools around the world. The article “Contemplative Education: A Systematic, Evidence-Based Review of the Effect of Meditation Interventions in Schools” (Waters, Barsky, Ridd & Allen, 2014) is an exceptional resource that holds the information of 15 studies in one document. I learned that the “Collaborative for Academic, Social, and Emotional Learning in the USA allocated \$7 million to the development of curriculum that promotes social-emotional learning” (Waters, Barsky, Ridd & Allen, 2014, p.2). This information infers that these programs will start popping up in many schools and communities to improve students over all well-being and academic achievement. The article supports my assumptions when it says that “Student well-being has become a key agenda for schools, and many now consider it an educational outcome that is of equal importance to academic achievement” (Waters, Barsky, Ridd & Allen, 2014, p.108). I couldn’t agree more with this statement, and I support that by conducting this thesis to examine how mediation and mindfulness promote students overall success in elementary schools, including social and behavioral achievement. It should also be noted that according to Maslow’s Hierarchy of Needs (McLeod, 2007), when students are no longer consumed by stress, whether it be physical or emotional, they have more time to focus on self-enlightenment and the pursuit of knowledge. Therefore, when these articles are only discussing the behavioral and emotional benefits that meditation and mindfulness can have on students, I speculate that students’ academic achievement improve as well.

As previously mentioned, I have two main meditation practices in mind: mindfulness and Transcendental Meditation (TM). Mindfulness can be defined as, “deliberately focusing attention in the present moment, without judgment, to the experience that unfolds” (Waters, Barsky, Ridd & Allen, 2014, p.3). The terms meditation and mindfulness interchangeably

throughout this thesis because the act of meditating promotes mindfulness, and mindfulness can happen mainly through the act of meditating. For classrooms, having your students be mindful of their learning and metacognitively aware in their learning of what they're discovering is the ideal end goal that most teachers hope their students will achieve. Meditation is a nonintrusive and multi-beneficial way to implement these qualities. TM can be defined as "Silently repeating a word or mantra to achieve a meditative state. When distracting thoughts arise, attention is repeatedly redirected back to the mantra" (Waters, Barsky, Ridd & Allen, 2014, p.106). This practice of meditation takes more time to teach and may be criticized by some parents or guardians that the act borders on being a religious or spiritual practice for consumption in public schools. However, the review of 15 different meditation methods and programs shows that TM is the method that proves to be the most effective in overall well-being and academic achievement for elementary students in public schools. "The evidence to date shows that TM has more consistent significant effects on well-being (83%) in comparison to mindfulness and other meditation techniques" (Waters, Barsky, Ridd & Allen, 2014, p.119). A success rate of 83% was achieved without the intrusion of medications or costly interventions. The programs do not even take much time, the past two experiments that I mentioned took about 15 minutes per day for 3 days a week, and only 2 minutes during the other two days of the week.

After reading all of these articles which stated the emotional and behavioral benefits of meditation and mindfulness in the classroom, with the assumption that academic progress existed, it was a relief to find an article that straightforwardly showed the direct impact of meditation to grade point average. The study titled "The Effect of Meditation on the Academic Performance of African American College Students" (Hall, 1999) is not about students in public

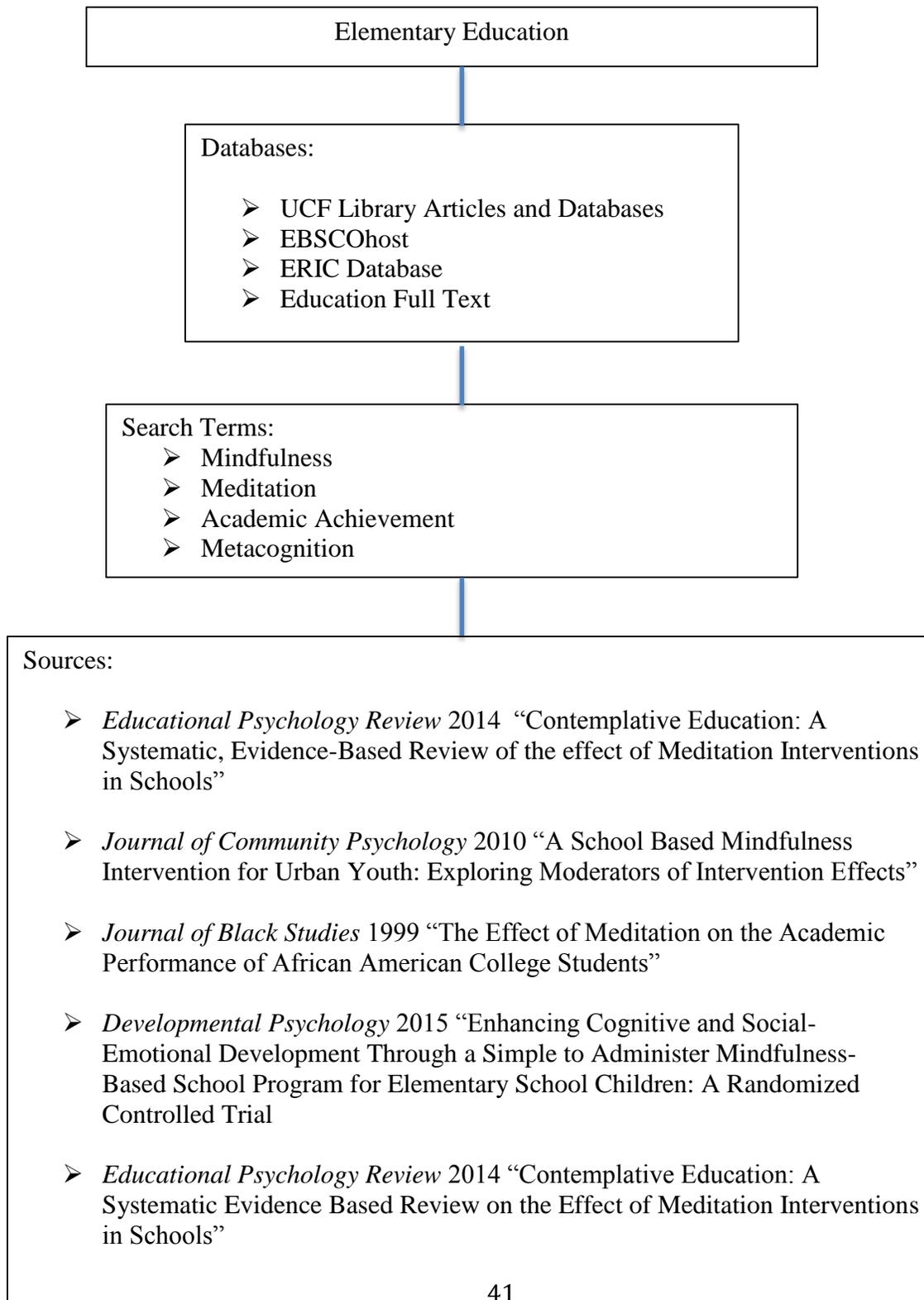
elementary schools. However, the findings from their study are undeniable. The experiment had 56 college students participate in Transcendental meditation for 10 minutes before a one-hour study period, and 10 minutes after the study period, as well as prior to taking an exam. Like the other studies, their main goal was to reduce stress, which would then promote cognition and improved memory (Hall, 1999). They quoted another article, which stated “children in public schools who were taught to meditate displayed an increase in academic performance” (Hall, 1999, p.500). Alongside having a mantra to stay focused and regain attention, the subjects participated in natural breathing techniques and relaxation. The study also included a control group of students who spent the same amount of time studying for an exam, but did not participate in the meditation techniques. Both groups had Grade Point Average (GPA) averaging 2.77 and 2.64, showing that they started the experiment roughly at the same spot (Hall, 1999). The study started at the beginning of fall semester. At the beginning of the spring semester the meditation groups GPA was .3 points higher than the non-meditative group, 2.85 versus 2.55 (Hall, 1999). This statistic analysis shows that the non-meditative groups overall GPA decreased over the fall semester. By the end of the spring semester, the gap widened with the meditative groups’ GPA at 2.93 and the non-meditative groups GPA at a 2.48 (Hall, 1999). Yet again, the non-meditative group who spent the same amount of time studying the same material for the same exams as the meditative group had a drop in their average grade point averages from the start of the semester. This study suggests the strong and direct impact Transcendental Meditation has on academic achievement.

To summarize, multiple mindfulness and meditation programs have been implemented in elementary schools around the United States. Some schools take the more mindful approach and

follow a mantra, like in TM and Mindful Schools curriculum. Other programs, like the Holistic Life Foundation, take a more active approach and include yoga inspired techniques into their interventions. The consensus of the articles I read was that TM was the hardest to implement, but the most effective in increasing students attention and bettering their behavior than any other type of mindfulness training. One study done with college students showed a direct increase to students GPAs when they partook in TM before studying and before taking a test (Hall, 1999)

The research surrounding meditation and mindfulness information is imperative to address as its methods are nonintrusive, neither physically to the student, nor intrusive on teachers' time. With the shown impact of meditation and mindfulness on people's attention and behavior, the following chapter on exceptional education will further examine how these interventions can impact students who struggle with attention disorders and behavioral challenges.

Figure 4: Elementary Education Literature Map



Elementary Education Articles

- Black, D. S., & Fernando, R. (2013). Mindfulness training and classroom behavior among lower-income and ethnic minority elementary school children. *Journal of Child and Family Studies, 23* (7), 1242-1246
- Gould, L. F., Dariotis, J. K., Mendelson, T., & Greenberg, M. T. (2010). A school-based mindfulness intervention for urban youth: Exploring moderators of intervention effects. *Journal of Community Psychology, 40* (8), 968-982.
- Hall, P. D. (1999). The effect of meditation on the academic performance of African American college students. *Journal of Black Studies, 29* (3), 408-115
- Schonert-Reichl, K. A., Oberle, E., Lawlor, M. S., Abbott, D., Thomson, K., Oberlander, T. F., & Diamond, A. (2015). Enhancing cognitive and social-emotional development through a simple-to-administer mindfulness-based school program for elementary school children: A randomized controlled trial. *Developmental Psychology, 51*(1), 52-66.
- Waters, L., Barsky, A., Ridd, A., & Allen, K. (2014). Contemplative education: A systematic, evidence-based review of the effect of meditation interventions in schools. *Educational Psychology Review, 27* (1), 103-134.

Elementary Education Supplemental Resources

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<http://www.simplypsychology.org/maslow.html>

Chapter Seven: Review of the Research Literature Related to Exceptional Education

Inclusion of students who have been diagnosed with ADHD, autism, behavior, and other learning challenges in the classroom nowadays is mandatory. Studying and understanding learning disabilities is the responsibility of every teacher. A main resource to understand learning disabilities is to be knowledgeable in exceptional education. Exceptional education focuses on specific modifications and accommodations that need to be made in the every day classroom to help provide equal access to all students. A parental guide found on the Florida Department of Education (FLDOE) website simply defines modifications as changes made to what students are expected to learn, and defines accommodations as the changes made to the way students learn and how they are tested (Harford County, 2003). These modifications and accommodations can be found on students Individualized Education Plans (IEP) and on students' 504 Plans.

However, these methods should be implemented in classrooms all the time whether there are students with exceptionalities or not. Research has shown that it is possible to include meditation and mindfulness programs in classrooms. When this was done, the methods improved the student's attention and behavior, and other research suggests that the same tools will be beneficial to students on the autism spectrum. The article "Back to basics: Working with young children with autism in inclusive classrooms" (Deris & DiCarlo, 2013) lists the adaptations needed in an inclusive classroom to accommodate to a student on the autism spectrum. The third item on their list was to have a quiet, comfortable area set up in the classroom where the student can relax and take themselves out of an undesirable situation, where they can take a break from stimuli (Deris & DiCarlo, 2013). A great way to incorporate this section of a classroom is to

create a sort of meditation center, perhaps one that is sectioned off with pillows and a yoga mat. If meditation is used as a tool in the inclusive classroom, then any student, specifically with autism, who needs a break can go to this designated section to cool off and allow themselves time to become mindful of the task they need to complete. A study done at Chelsea School Silver Spring, Maryland provided an intervention of TM to 10 students with ADHD. Like the studies mentioned before, the intervention did not take up much time, as it only lasted for “ten minutes twice daily for three months” (Krisanaprakornkit, Ngamjarus, Witoonchart, & Piyavhatkul, 2010, p.5). The study compared the students before and after the intervention and the concluding results showed that the 10 students were less stressed, calmer, less distracted, and better able to control their frustration (Krisanaprakornkit, Ngamjarus, Witoonchart, & Piyavhatkul, 2010). Using this information and implementing it to an inclusive classroom with students who are on spectrum, a classroom teacher would be able to effectively use TM as a tool to adapt the classroom for differing exceptionalities.

In the modern classroom there are students who differ in terms of ability levels and learning disabilities. It is rarely seen that one class consists of every student on the same level of achievement. It can become a tricky feat for one teacher to adhere to every one of the student’s individual needs. Sometimes, a student will have a diagnosis of more than one disability. An article published in the *Journal of Child and Family Studies* “Using Integra Mindfulness Martial Arts to Address Self-regulation Challenged in Youth with Learning Disabilities: A Qualitative Exploration” (Milligan, Badali, & Spiroiu, 2013) explored an after school program for students diagnosed with varying learning disabilities such as ADHD, Generalized Anxiety Disorder, and other behavior and social problems and how this program integrated mindful martial-arts (MMA)

to help these students cope with their challenges outside of the classroom, and also within a school environment, which was previously viewed as stressful. The goal of the MMA program was to incorporate mindfulness techniques that “serve to enhance awareness of the present moment and to increase nonjudgmental observation. From this present-focus, youth learn that they can choose how they react to challenges rather than reacting in an automatic or reflexive manner” (Milligan, Badali, & Spiroiu, 2013). Although this afterschool program differs from the previous programs mentioned in terms of measuring achievement in the classroom, it is crucial to note that students with learning disabilities face the challenges in the classroom, and also when they leave. The ultimate goal is to provide students with strategies to live successful lives and to overcome undesirable circumstances. MMA is one tool that can be used to help students with various learning disabilities cope and manage the struggles.

Although helping students cope with behavioral and social challenges is a core part of helping students achieve academically, researchers, and teachers also need to know how to help students who have neurodevelopmental disorders, or deficits. One deficit that is prevalent in students with some learning disabilities is their ability to retrieve information from their working memory (WM), also known as short-term memory. To better understand the following studies that I reviewed, it’s imperative to know the definition of working memory. Medicinenet.com is a website that provides terms and information that’s related to the medical field. They define working memory as “a system for temporarily storing and managing the information required to carry out complex cognitive tasks such as learning, reasoning, and comprehension” (MedicineNet, 2013). Without this ability, it is a giant strain on some students to hold on to new

information without rigorous repetition or other tools to help move the information into long-term memory.

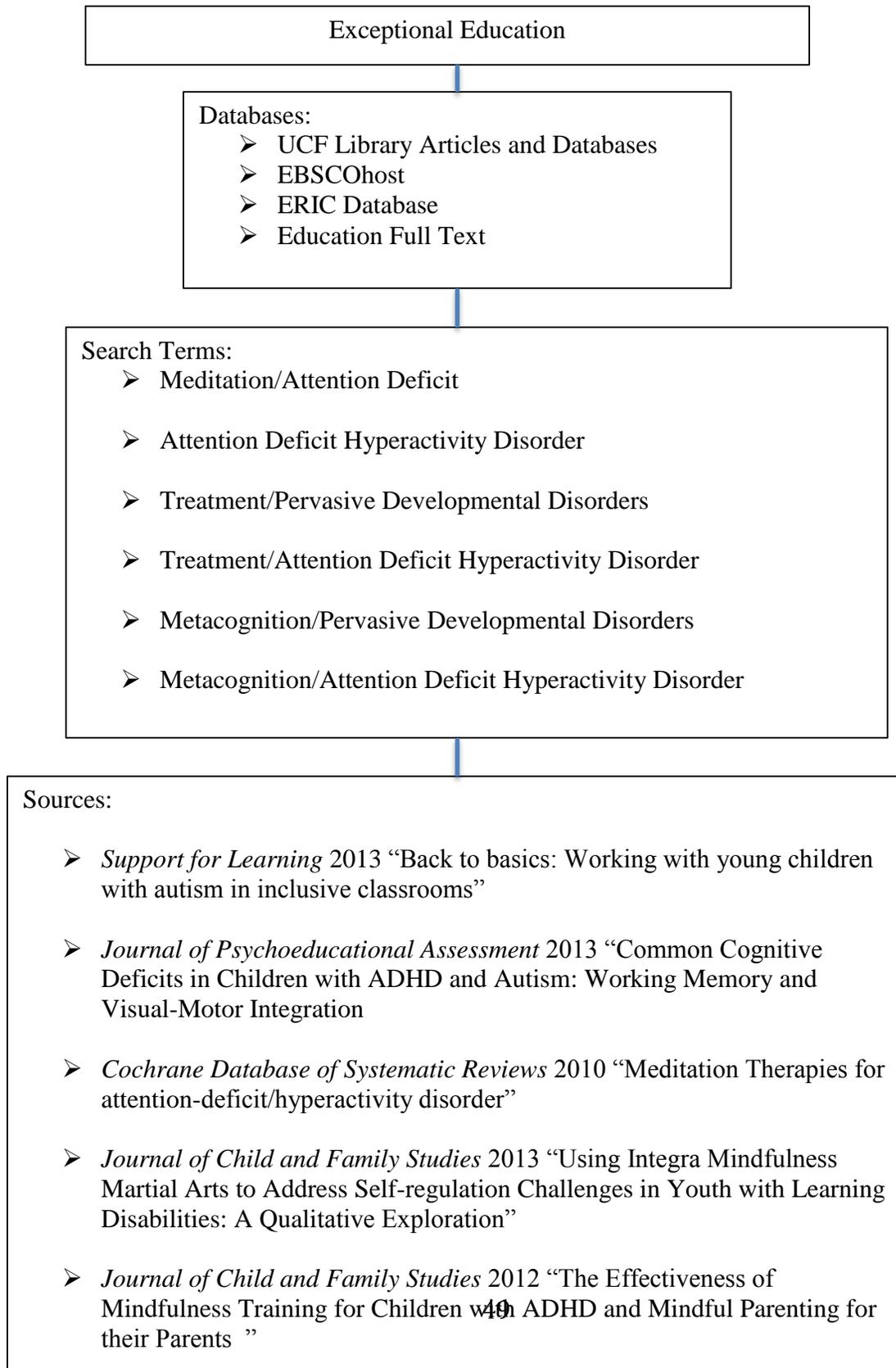
A study out of the *Journal of Psychoeducational Assessment*, “Common Cognitive Deficits in Children with Attention-Deficit/Hyperactivity Disorder and Autism: Working Memory and Visual-Motor Integration” (Englund, Decker, Allen, & Roberts, 2013) determined that there is a similarity in the cognitive deficits in children who have ADHD, and in children who are on the autism spectrum. “[These similarities] may be explained by the similarity in frontal lobe abnormalities found in both groups... These findings are important because abnormalities in the frontal lobes are also linked to observed cognitive deficits in working memory (WM) and executive functions” (Englund, Decker, Allen, & Roberts, 2013, p.96).

To sum up, teaching students with varying achievement levels is a difficult task, especially when there are students included in the class with exceptionalities, such as learning disabilities, ADHD, or autism. There are many strategies, accommodations, and modifications that are listed on these students individual plans to help them succeed in the classroom. However, these methods are most of the time beneficial to everyone in the classroom. As evident in the study by Englund, Decker, Allen, and Roberts, sometimes there are similar challenges that different students will face. For example, the same frontal lobe deficit is noted in children with autism, and in children with attention deficit hyperactivity disorder, which decreases the retention of working memory. Thankfully, mindful meditation has shown to be a useful tool in increasing short-term memory, thus improving long-term memory, which can in turn lead to academic success. Implementing meditation in the classroom, whether it be in the

form of yoga, martial arts, or mindfulness training, can help some students, specifically those with learning challenges, be able to have the tools to succeed in an inclusive classroom.

The following chapter of the review of the research literature of medicine will go further on to explain the possible side effects of prescribed medications to treat the symptoms of ADHD and explain how the benefits of mindfulness meditation can help treat the symptoms of some learning disabilities as well as the possible side effects to taking medications.

Figure 5: Exceptional Education Literature Map



Exceptional Education Articles

Deris, A. R., & Di Carlo, C. F. (2013). Back to basics: Working with young children with autism in inclusive classrooms. *Support for Learning, 28* (2), 52-56.

Englund, J. a, Decker, S. L., Allen, R. a, & Roberts, a M. (2013). Common cognitive deficits in children with attention-deficit/hyperactivity disorder and autism: Working memory and visual-motor integration. *Journal of Psychoeducational Assessment, 32*(2), 95-106.

Krisanaprakornkit T, Ngamjarus C, Witoonchart C, Piyavhatkul N. (2010). Meditation therapies for attention-deficit/ hyperactivity disorder (ADHD). *Cochrane Database of Systematic Reviews, 16* (6), 1-36

Milligan, K., Badali, P., & Spiroiu, F. (2013). Using integra mindfulness aartial arts to address self-regulation challenges in youth with learning disabilities: A qualitative exploration. *Journal of Child and Family Studies, 24* (3), 562-575.

Oord, S. van der, Bögels, S. M., & Peijnenburg, D. (2012). The Effectiveness of mindfulness training for children with ADHD and mindful parenting for their parents. *Journal of Child and Family Studies, 21*(1), 139-147.

Exceptional Education Supplemental Resources

Harford County [MD] Public Schools Special Education Programs. (2003).

Accommodations and modifications guide. Retrieved from www.fl DOE.org

MedicineNet (2013). Definition of Working memory. Retrieved from

<http://www.medicinenet.com>

Chapter Eight: Review of the Research Literature Related to Medicine

This chapter provides a particular focus on meditation and mindfulness from the viewpoint of the discipline of medicine. For the purposes of this paper, medication will be defined as the substances or pharmaceuticals used in medical treatments, which are usually prescribed by a doctor and filled by a pharmacist. Medicine will be defined as the science of healing, or the profession of medicine. Many studies have shown that stimulant medications are the most effective in the treatment of ADHD, and also tend to be the most popular choice for parents in the treatment of their child who is diagnosed with the disorder. In 2001, the American Psychological Association (APA) published to their online journal an article titled *The Ritalin Debate* where it stated, “One child in every U.S. classroom has been diagnosed with attention-deficit/hyperactivity disorder (ADHD)--a number equal to 3 to 5 percent of all school-age children. To treat the condition, more than two million prescriptions for Ritalin--methylphenidate--are written each year” (APA, 2001).

Even though Ritalin is a commonly prescribed treatment, there are trials showed the possible side effects of taking methylphenidate. “At least one RCT [Randomized Control Trial] included in the first systematic review found that sleep disorders, anorexia or appetite disturbance, headache, motor tics, irritability, and abdominal pain were significantly more common in children receiving methylphenidate compared with placebo” (Keen & Hadjikoumi, 2011, p. 12). When looking at the data, it can be alarming to think that we are exposing these side effects to almost three to five percent of all school-aged children.

Therefore, interest is mounting in non-pharmacological treatments, as some patients experience intolerable side effects or do not respond to the treatment at all (Zylowska, Ackerman, & Yang et al., 2007). Even when medically prescribed medications are the most

effective and popular choice to use in the treatment of ADHD, the medicinal treatment route is not for everyone.

The *Journal of Alternative and Complementary Medicine* conducted a study on the methods used to treat children aged four to ten who were diagnosed with both autism and ADHD. While compiling information on what treatments worked best, they separated the symptoms caused by autism and symptoms associated with ADHD. “Autistic spectrum disorders are complicated conditions that may require an integrative treatment protocol involving many factors including behavioral and social therapy, pharmacotherapy, environmental control, and nutritional therapy” (Patel & Curtis, 2007, p. 1092). Meditation and mindfulness could be used as an aid in behavior and social therapy by increasing relaxation while decreasing stress responses. The *Journal of Pediatrics* published an article review of multiple studies about the effect of sitting-meditation in youth.

They concluded, “Our review of 16 studies provides initial evidence that sitting meditation can be an effective intervention for the treatment of physiologic, psychosocial, and behavioral problems among children and adolescents” (Black, Milam, & Sussman, 2009, p. 538). Also, keeping a mindful-meditation curriculum within the classroom or school will create a more stable and relaxed environment. This environment would evoke a calm demeanor within students and create a sense of community and one-ness between the classroom and school. “Likewise, ADHD is a multifactorial disorder that is usually treated with stimulants and other medications plus behavioral/educational therapy” (Patel & Curtis, 2007, p. 1092). The doctors found that a multi-method approach was the best overall treatment for these patients. Some of the multiple treatment plans included medication, but an important point to be made in this study

is that the use of medication is suggested to be paired with other treatments, meaning that prescribed medications are not the end-all, be-all answer to these patients problems, and taking medications can sometimes create other problems for the patients such as side effects.

The clinical study published by the *Journal of Clinical Evidence* lists the results of medication prescribed to children and adolescents diagnosed with ADHD. The side effects of taking the drug Atomoxetine, which is the main ingredient of the prescribed medication Strattera, included decreased appetite, nausea, vomiting, suicidal ideation, depression, liver disease, and seizures (Keen & Hadjikoumi, 2011, p. 3). Although these side effects may not occur in every person who takes the medication, people and parents who do not like the risk involved in prescribing this medication to themselves, or to their child often resist. Zylowska, Ackerman, Yang, and fellow authors (2007) describe mindfulness meditation as “a technique that emphasizes an observant and nonreactive stance toward one’s thoughts, emotions, and body states” (Zylowska, Ackerman, & Yang et al., 2007, p.738). These are the outcomes that are associated with taking prescribed medications, but can also be achieved in a noninvasive way through meditation and mindfulness. The authors continue to say, “Mindfulness meditation involves experiential learning via silent periods of sitting meditation or slow walking and purposeful attention to daily activities” (Zylowska, Ackerman, & Yang et al., 2007, p. 738). None of these techniques will cause the same harmful side effects as the ones associated with taking Ritalin or Strattera.

Meditation, whether it be in the form of sitting, slow walking, yoga, or martial arts is an activity that can be done by everyone no matter age or ability level. Pediatric doctor Kalpana Patel and medical researcher Luke Curtis say, “Intensive behavioral interventions beginning at

an early age seem to have considerable future promise in treating autism” (Patel & Curtis, 2007, p. 1091). This information makes a stronger support for including mindfulness meditation therapies in elementary classrooms when the students are young, especially if the student has any neurodevelopment disorders.

A good point to think about in relation to starting students on mindfulness meditation therapies when they are young was mentioned by Tang, a psychology professor at Texas Tech University, Holzel, a doctor of neuroscience at Massachusetts General Hospital and Posner, a professor of neuroscience at the University of Oregon. They collected previously recorded data on the effects of mindfulness meditation on the brain; specifically what sections of the human brain are affected when the subject is actively meditating. Published in the *Journal of Neuroscience* (2015), they state, “[correlational studies] still cannot prove that meditation practice has caused [brain function changes] because it is possible that individuals with these particular brain characteristics may be drawn to longer meditation practice” (Tang, Holzel, & Posner, 2015, p. 214). An argument could be made that if people are exposed to the methods early at an early age, they will be accustomed to mentally rely on mindfulness meditation as a source of calmness and continue to use a mantra to regain focus, in ways advocated by TM. The continued practice could then become a future lifestyle for these students once they became adults.

Technology is amazing, especially in the field of medicine and now neuroscientists are able to scan and monitor patients’ brain functions using noninvasive MRI technologies while patients perform various activities, such as meditation and mindfulness. Doctors can then record which areas of the brain are activated during specific activities. In the article titled “The Neuroscience

of Mindfulness Meditation” plainly states which parts of the brain are being activated during a state of meditation that were not activated during a baseline state:

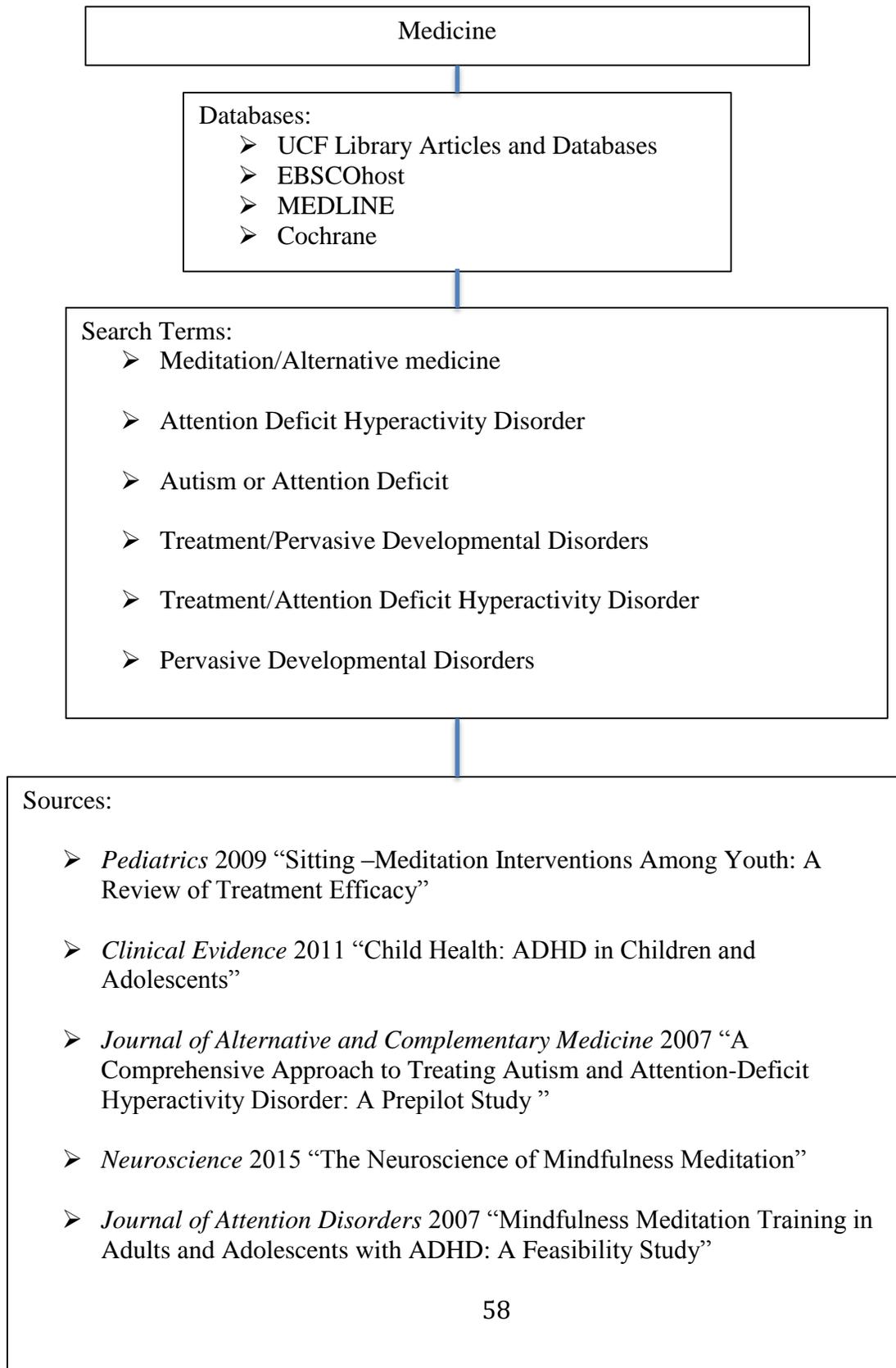
The caudate, which is thought (together with the putamen) to have a role in attentional disengagement from irrelevant information, allowing a meditative state to be achieved and maintained; the entorhinal cortex (parahippocampus), which is thought to control the mental stream of thoughts and possibly stop mind wandering; and the medial prefrontal cortex, which is thought to support the enhanced self-awareness during meditation (Tang, Holzel, & Posner, 2015, p. 215).

These findings align with other research in this field in that all researcher would agree that when people are in a meditative state, they become more aware and more focused to the present moment. With the use of neuroscience and brain scans, researchers can now validate that the stories told by meditators are true. The findings of brain sections and their functions which are activated during meditation correlate with what meditators describe happening during and after meditation, “TM practice uses the sound value of a mantra to draw attention within the mind, experience quieter levels of thinking, and draw forth a restful state of awareness referred to as ‘clear consciousness’” (Black, Milam, & Sussman, 2009, p. 533).

The techniques and different forms of meditation can be incorporated into any classroom without the consent of a doctor or the process of a physical evaluation. It should also be noted that although meditation promotes relaxation, this is not the sole goal of including a mindfulness curriculum into an elementary classroom. “The main activity is a cognitive and intention-based process characterized by self-regulation of attention to the present moment with an open and accepting orientation toward one’s experiences” (Zylowska, Ackerman, & Yang et al., 2007, p.

738). A relaxed mind can alleviate the stresses students can face on a daily basis. When students have a rough home life, learning disabilities, or social anxieties it is hard for them to remain focused on what is happening at that moment in the classroom. However, educators are turning towards mindfulness meditation to teach and promote self-regulation, so that students can continue to be mindful and present even while not in a meditative state.

Figure 6: Medicine Literature Map



Medicine Articles

Black, D. S., Milam, J., & Sussman, S. (2009). Sitting-meditation interventions among youth: a review of treatment efficacy. *Pediatrics*, *124*(3), e532-e541.

Keen, D., & Hadjikoimi, I. (2011). Child health: ADHD in children and adolescents. *Clinical Evidence*, *2*(August 2009), 1–34.

Patel, K., & Curtis, L. T. (2007). A comprehensive approach to treating autism and attention-deficit hyperactivity disorder: a prepilot study. *Journal of Alternative and Complementary Medicine (New York, N.Y.)*, *13*(10), 1091-1097.

Tang, Y., Hölzel, B. K., & Posner, M. I. (2015). The neuroscience of mindfulness meditation. *Nature Reviews. Neuroscience*, *16*(4), 213-225.

Zylowska, L., Ackerman, D. L., Yang, M. H., Futrell, J. L., Horton, N. L., Hale, T. S., ... Smalley, S. L. (2007). Mindfulness meditation training in adults and adolescents with ADHD: A feasibility study. *Journal of Attention Disorders*, *11*(310), 737–746.

Chapter Nine: Synthesis of the Literature

The goal of this thesis was to research the outcomes a variety of mindfulness meditation programs have on students within the elementary classroom. The research was taken from five different perspectives: health and wellness, psychology, elementary education, exceptional education, and medicine. Overall, research within the discipline of health and wellness seems to echo the idea that, “Meditators performed significantly better than non-meditators on all measures of attention. Further more, self-reported mindfulness was higher in [experienced] meditators than non-meditators” (Moore & Malinowski, 2009, p.182). These thoughts are similar to what the discipline of psychology has to offer about students following a meditation curriculum, “They were better able to focus and relax, reduce anxiety before taking a test, make better decisions when in conflict, and were more easily able to redirect their attention when off-task” (Napoli, Krech & Holley, 2008, p.103).

Similarly, research from the discipline of elementary education discusses the long-term effects of implementing a program focused on using Transcendental Meditation, “[Students will] silently repeat a word or mantra to achieve a meditative state. When distracting thoughts arise, attention is repeatedly redirected back to the mantra” (Waters, Barsky, Ridd & Allen, 2014, p.106). The department of exceptional education expands the benefits of promoting mindfulness meditation programs from increasing attention, to a coping mechanism for students facing social-emotional disorders, “[Mindfulness techniques] serve to enhance awareness of the present moment and to increase nonjudgmental observation. From this present-focus, youth learn that they can choose how they react to challenges rather than reacting in an automatic or reflexive manner” (Milligan, Badali, & Spiroiu, 2013, p.564). The research from the discipline of

medicine backs this claim by inclusively saying “Our review of 16 studies provides initial evidence that sitting meditation can be an effective intervention for the treatment of physiologic, psychosocial, and behavioral problems among children and adolescents” (Black, Milam, & Sussman, 2009. P.538). To summarize, all five disciplines are at a mutual consensus that mindfulness meditation can have a positive impact on students within the elementary classroom.

This is important because there is a need to find a safe and non-invasive alternative to prescribed medications, which are currently being used by some students who are diagnosed with ADHD, to treat the prevalent symptoms. One non-invasive intervention, meditation, can also be used as a tool to relieve stress and anxiety, increase focus and awareness, and counter the potential side effects that can occur from taking prescribed medications, such as Ritalin. Benefits which come from meditating are not only beneficial to students diagnosed with ADHD, but other students within the elementary classroom, including those with other specific learning disabilities, students on the autism spectrum disorder, and students facing poverty or other life struggles.

Therefore, the topics of specific learning disabilities, stresses, and every day struggles that our students can face need to be addressed. The *Psychology Today* website, defines the word stress as, “Stress is simply a reaction to a stimulus that disturbs our physical or mental equilibrium”. This means that any particular situation that entices change in someone’s life can stimulate stress responses in their brains. Some stress may be considered good, since it creates a “fight-or-flight” scenario and can save people from bad situations. However, long-term stress, stemming from a multitude of situations can have negative effects on people’s health. According

to the Anxiety and Depression Association of America (ADAA), “Stress is a response to a threat in a situation. Anxiety is a reaction to the stress” (ADAA). Ergo, students will become anxious as a result of a situation that caused them to be stressed. This stress and anxiety can interfere with a student’s ability to focus and be present in the classroom, since their mind may wander back to what is making them feel anxious.

Consequently, when students are not paying attention to the new material, or are not actively aware of what is happening, there is a less likely chance of the new information being transferred into long-term memory. Long-term memory is defined by Medicinenet.com as “A system for permanently storing, managing, and retrieving information for later use. Items of information stored as long-term memory may be available for a lifetime”. New information becomes stored into long-term memory through repetition and exposure of the information. Hence the importance of students staying focused during the presentation of the material. Without their focus, the information cannot be as easily retained.

All in all, sufficient research literature exists spanning across multiple disciplines, which tell the possible impacts that mindfulness or meditation has on students’ stress and anxiety levels, self-directed relaxation abilities, teacher-directed and self-directed attention and focus, all of which can lead to increased student academic achievement. Proof of the effect meditation has on the brain, and how the activated brain waves correlate to the noted impacts on students’ focus and memory. Also evidence that tells of negative side effects associated with prescribed medications used to address the symptoms of ADHD.

When the process of this thesis first began, I hoped to learn more about the possible

impacts that meditation or mindfulness might have on students' levels of focus and memory. As I complete this research across five related, but different disciplines, my research has shown that meditation or mindfulness is found to be a safe and non-invasive way to help some students succeed in the elementary classroom.

Synthesis References

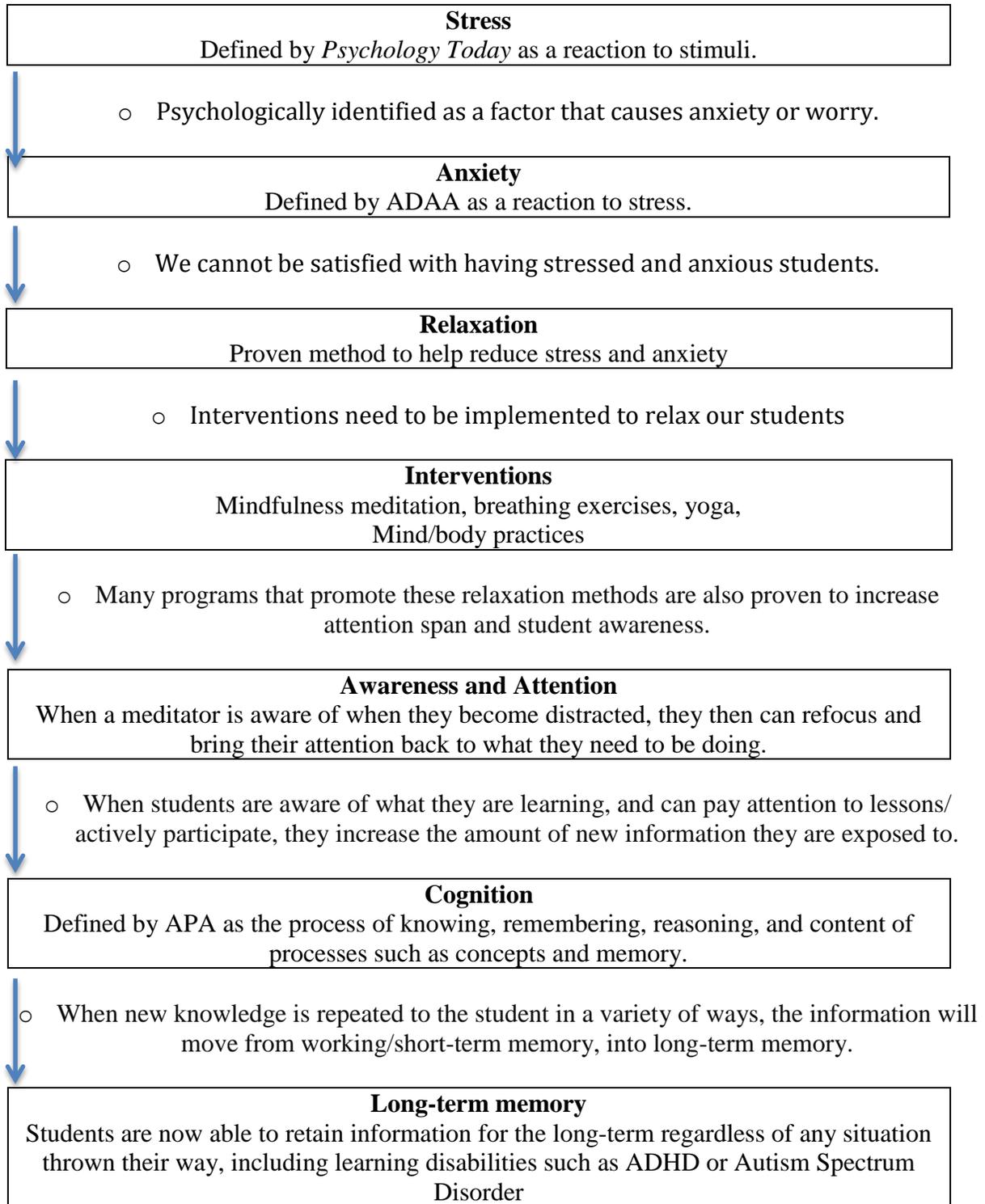
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Figure 7: Flow Map of Related Themes From Across the Disciplines



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