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**Teachers' Knowledge, Use, and Opinions of Online Resource Centers for Evidence-Based
Practices for Students with Learning Disabilities**

Arcadia University

Ed.D. Program in Education

Meredith A. Gapsis

A DISSERTATION

IN

EDUCATION

Presented to the Faculties of Arcadia University in Partial Fulfillment of the Requirements for
the Degree of Doctor of Education

2017

Dedication

I dedicate this dissertation to my daughter, Evelyn. This work, like my life with you, is a labor of love. Let it show you what can be accomplished through perseverance, hard-work, and dedication. You can achieve anything you set your mind to. Dream Big, Princess.

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Abstract

Students with learning disabilities represent a group of students who are frequently most in need of high-quality instruction in order to meet the academic goals consistent with their non-disabled peers (Kretlow & Blatz, 2011). Despite the existence of several easily accessible, free online resources and federal mandates in laws such as those in the Every Student Succeeds Act (ESSA, 2015) and the Individuals with Disabilities Education Improvement Act (IDEIA, 2004), research has found that teachers still fail to implement evidence-based practices in their instruction (Cook, Smith & Tankersley, 2012). The purpose of this study was to measure the level of knowledge held by teachers about online resource centers, their use of five particular online resource centers, and their opinions of the value of the resources at these sites. To this end, 410 teachers in one suburban district in the mid-Atlantic region of the United States were invited to participate in a quantitative survey. This instrument was developed by the researcher for the purpose of this study. Results indicated that the majority of teachers lacked familiarity with these online resource centers. However, those who were familiar and had used such resources reported them as being somewhat to very valuable in determining instructional practices for students with learning disabilities.

Keywords: learning disabilities, students with disabilities, evidence-based practices, educational research, online resource centers, research-to-practice gap

Chapter I

Introduction

Background

Evidence-Based Practices (EBPs) are those which have been shown by high-quality research to produce meaningful outcomes (Torres, Farley & Cook, 2012). While EBPs have a long-standing history in fields such as medicine, nursing, and psychology, their application in the field of education is still in its infancy (Cook, Smith & Tankersley, 2012). Federal mandates in the Every Student Succeeds Act (ESSA, 2015) and the Individuals with Disabilities Education Improvement Act (IDEIA, 2004) require teachers of students with disabilities, including learning disabilities (LD), to consider research evidence when making educational decisions related to curriculum and instruction. These mandates have resulted in extensive work among researchers to define the term “evidence-based practice” and to identify EBPs to support classroom instruction (Cook, Smith, & Tankersley, 2012; Odom et al., 2005; Spooner, Knight, Browder, & Smith, 2012). Adherence to policy is a critical step toward improving academic outcomes for students, especially for those special education students whose academic and behavioral challenges can serve as impediments to making adequate progress (Kretlow & Blatz, 2011). Despite the long standing, effective use of EBPs in other fields, there remains skepticism among educators about the relevance of research in the educational decision-making process (Cook, Smith, & Tankersley, 2012). Research has consistently found that teachers over report both the use of EBPs and the efficacy of non-EBPs in their classrooms. Therefore, concern exists among researchers and practitioners regarding the quality of practices implemented in classrooms and the best methods through which to identify and disseminate effective practices (Odom et al., 2005).

Research and evidence-based practices in special education. Special education research is especially complex due to the variability among participants and diverse contextual settings in which instruction takes place (Odom et al., 2005). Therefore, determining EBPs in special education poses unique challenges that are not a concern in general education research. In an effort to establish a set of clearly defined, consistently implemented guidelines for use in determining EBPs in special education, the Division for Research of the Council for Exceptional Children (CEC) commissioned a series of papers that proposed a set of quality indicators for various types of research (Cook, Tankersley, & Landrum, 2009). The resulting quality indicators for group-experimental/quasi-experimental and single-subject research were then put to the test in five meta-analyses of special education practices (Cook, Tankersley, & Landrum, 2009). These analyses found that the rigorous quality standards set by the CEC were not met in the majority of existing studies, and appropriate modifications to the quality indicators were suggested (Cook, Tankersley, & Landrum, 2009). Though there is still no consensus on what standards should be used to determine EBPs in special education, these studies serve as a first step in creating a universal set of guidelines.

While most of the online resource centers (ORCs) for EBPs rely heavily upon group experimental research to determine effective practices, special education research frequently implements case studies or single-subject design to measure the efficacy of educational interventions and instructional strategies (Horner et al., 2005). Single-subject research often better meets the needs of special educators through its focus on: students as individuals; replicable methods of testing interventions; cost effective strategies; and a frequent focus on external and social validity providing practical, generalizable findings (Horner et al., 2005). Despite the benefits of single-subject research for classroom teachers, a lack of consensus exists

on the use of single- subject research in determining EBPs (Horner et al., 2005; Spooner et al., 2012). Acknowledging this as furthering the research-to-practice gap, Horner and colleagues (2005) offer standards for utilizing single-subject research in the determination of EBPs and characterize single-subject research as “a rigorous scientific methodology used to define basic principles of behavior and establish evidence-based practices.”

Establishment of evidence-based research and ORCs. In an effort to make EBPs readily available to practitioners, multiple research organizations have established free ORCs which present the findings of evidence-based syntheses and make recommendations for practice. Among the most widely utilized databases are the What Works Clearinghouse (WWC) and the Best Evidence Encyclopedia (BEE) (Kretlow & Blatz, 2011). Additional ORCs for students with LD include the Alerts Series, National Center on Intensive Intervention, and the National Technical Assistance Center on Transition. Each of these research organizations has identified their own criteria for EBP designation and for determining research quality (Odom et al., 2005).

The need for EBPs in education. Despite the availability of information regarding EBPs which is available through ORCs, teachers report a lack of knowledge on how to access evidence-based research and a lack of time to seek out this information independently (Burns et al., 2010; Kretlow & Blatz, 2011; Mazzotti, Rowe, & Test, 2012). For classroom teachers, access to evidence-based research holds the potential to increase student educational outcomes (Mazzotti et al., 2012; Torres et al., 2012), but this potential has gone largely unrecognized as only 13.5% of educators report regularly using the internet to explore research on teaching and learning (Santangelo, Ruhaak, Kama, & Cook, 2013). The need for implementation of EBPs in the classroom is further strengthened by a concern in education that a continuous focus on practices with no empirical basis often results in wasted funds. Furthermore, educators perceive

their time and energy is wasted on “fads,” leading to a mistrust of future research-based practices, and a lack of positive student outcomes (Horner et al., 2005). The application of EBPs to instruction may bridge this research-to-practice gap for students with disabilities (Spooner et al., 2012).

Current use of EBPs in schools. Teachers are placed in the position of making decisions about which strategies and practices to implement in their classroom (Kretlow & Blatz, 2011). Despite EBPs potential to provide instructional strategies and interventions for improved student outcomes, special education teachers have recently communicated that they do not knowingly implement practices designated as evidence-based (Burns et al., 2010; Mazzotti et al., 2012). Additionally, special education teachers report that they are more likely to use strategies that work for their students than to utilize practices or curricula that they are required to teach (Boardman, Arguelles, Vaught, Hughes, & Klingner, 2005). This reluctance among special educators to allow research to guide practice poses a significant hurdle in the effective implementation of EBPs. Guidelines for determining if a practice is evidence-based are often difficult for teachers to interpret (Kretlow & Blatz, 2011). Mazzotti et al. (2012) report that special education teachers often lack the tools to select and implement practices which have been determined through research to be successful. This reveals a need to support the use of professional judgment in selecting practices based on student need in conjunction with the identification and implementation of EBPs. Furthermore, the existing discrepancy in criteria used to classify practices as evidence-based has understandably led to a lack of clarity for teachers as to what constitutes an EBP (McDuffie & Scruggs, 2008).

The research-to-practice gap. The factors outlined above have combined to create a research-to-practice gap in education. While a vast amount of information has been generated in

the field of EBPs, including the identification of specific practices as evidence-based, few teachers are aware of where to find, or how to make use of these resources (Stormont, Reinke, & Herman, 2011). Also, despite over a decade of research behind EBPs in education, skepticism among educators remains high, and the research-to-practice gap is as broad as ever. There are many factors which contribute to the research-to-practice gap. Clearinghouse sites such as the WWC and the BEE, among others produce and publish EBP resources free of charge through their websites. Though these resources are readily available, a majority of educators may be unaware of this body of information. While nearly 90% of educators report using one or more EBP in their weekly instruction (Burns & Ysseldyke, 2008), fewer than 10% could accurately identify EBPs when given a list from which to select practices (Stormont, Reinke, & Herman, 2011). Novice special education teachers who have just completed their training programs reported a lack of knowledge related to EBPs and often believe that practices are evidence-based when indeed they are not (Jones, 2009). Even when teachers are informed about EBPs and take the time to research practices for their classroom, a lack of adequate support and professional development can lead to low fidelity of implementation.

Statement of the Problem

The current literature on EBPs for students with LD demonstrates clear areas of need related to improving practitioner knowledge of and access to EBPs. Further research is needed to identify the extent of knowledge held by educators regarding the EBP resources which are available to them. This research should aim to identify which ORCs are most frequently utilized and for what purposes, as well as explore how useful teachers find such resources to be when they access ORCs for educational research. Once research is able to identify what teachers

know, or more accurately what they do not know, steps can be taken to fill in these informational gaps.

Purpose of the Study

This dissertation study fills gaps in the research related to practitioner knowledge, use, and opinions of ORCs for EBPs for students with LD. This study utilizes quantitative sample survey research to answer the following research questions:

1. Do K-12 teachers of students with learning disabilities know about and use the five online resource centers?
 - a. What resources do K-12 teachers of students with learning disabilities make use of at these sites to determine classroom practice?
2. Do K-12 teachers of students with learning disabilities believe that the five online resource centers in this study are a valuable tool to use in determining practice?
3. Does a teacher's level of education, area of certification, number of years teaching, grade levels taught, subject areas taught, and/or type(s) of students taught impact their self-reported level of knowledge, use, or opinions of online resource centers for EBPs?

Summary of Methods

This dissertation study was conducted using quantitative survey research. Data collection took place through the email distribution of a web-based questionnaire to teachers in one suburban school district located in the mid-Atlantic region of the United States. The questionnaire was hosted through Qualtrics and distributed via school district email. Potential participants received three recruitment emails: an initial contact and two follow-up contacts. All

participants were teachers currently employed by the school district in which the researcher is employed and represent a convenience sample.

Definition of Terms

6S Model – a hierarchical decision making model originally developed by Haynes (2001), and grounded in the field of medicine, with potential application to education, which practitioners can use to determine the quality of research findings.

Best practice – instructional practices which have been recommended by experts but may or may not meet the standard to be evidence-based or effective (Cook, Smith, & Tankersley, 2012). In the hierarchy of educational practices, best practices have less empirical support than effective practices, research-based practices, and evidence-based practices.

Effective practice – instructional practices that actually result in meaningful outcome gains for the majority of students, yet may not be recognized as evidence-based due to the quantity or quality of the supporting research (Cook et al., 2012). Effective practices are second in the hierarchy of educational practices, with more empirical support than best practices, but less empirical support than research-based practices and evidence-based practices.

Effect size – measures the magnitude of a treatment effect and is generally calculated as the standard difference between two means (Becker, 2000). Effect size is used to report treatment effects in meta-analytic research.

Every Student Succeeds Act (ESSA) – an act of congress signed into law on December 10, 2015 which reauthorized the 50-year-old Elementary and Secondary Education Act, most recently known as No Child Left Behind (ESSA, 2015). Significant changes to NCLB in ESSA include allowing states the power to determine how to test students and how to intervene in failing schools.

Evidence-based practice – an instructional practice that is supported by a sufficient number of research studies that (a) meet high methodological quality standards, (b) make use of research designs that allow for assessment of effectiveness, and (c) demonstrate meaningful effect sizes indicating that the practice works (Cook et al., 2012). Evidence-based practices represent the highest level in the hierarchy of educational practices and have a greater amount of empirical support than research-based, effective, or best practices.

Individualized Education Program - a written document for each child with a disability that is developed, reviewed, and revised in a meeting in accordance with Sec. Sec. 300.320 through 300.324 of the Individuals with Disabilities Education Act (2004), and that must include (1) a statement of the child's present level of academic achievement and functional performance; (2) a statement of measurable annual goals; (3) a description of how the child's progress toward meeting annual goals will be measure and when reports of progress will be provided; (4) a statement of special education and related services and supplementary aides and services to be provided to the child; (5) an explanation of the extent to which the child will participate with nondisabled peers in the regular education class; (6) a statement of any individual appropriate accommodations; and (7) the projected data for beginning services, and the anticipated frequency, duration, and location of those services and modifications (IDEA, 2004, § 300.320).

Individuals with Disabilities Education Improvement Act (IDEIA) – an act of congress reauthorized in 2004 that mandates equity, accountability, and excellence in the education of students with disabilities (IDEA, 2004). IDEA mandates the use of scientifically based instructional practices to the maximum extent possible in the education of students with disabilities across subject areas.

Knowledge Translation - the process of moving from what has been learned through research to

application in different decision-making contexts such as identifying appropriate instructional practices to support students' needs (Curran et al., 2011).

Learning Disability – a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, which may manifest itself in the imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations (IDEA, 2004, § 602.30).

No Child Left Behind Act (NCLB) – a 2001 act of congress which reauthorized the Elementary and Secondary Education Act (NCLB, 2001). NCLB supports standards-based education and requires the use of scientifically based research to determine classroom practice.

Online Resource Center – the term I will use to designate an online source of pre-appraised evidence pertaining to educational practices.

Peer-reviewed research – a scholarly work (such as a paper or a research proposal) which has been checked by a group of experts in the same field to make sure it meets the necessary standards before it is published or accepted (Merriam-Webster, 2016).

Practice – the term I will use to designate the implementation of an educational idea, belief, or method. Practices are not published curricula and do not follow a prescribed method of implementation. Practices include direct instruction, flexible grouping, mnemonic devices, and group contingency incentives, among others.

Pre-appraised evidence – practitioner resources which have been created by various online resource centers and other academic organizations to facilitate ready access to high quality research (DiCenso, Bayley, & Haynes, 2009).

Program – the term I will use to designate a curriculum or other educational practice with a prescribed method of implementation. A program is more formalized than a practice and has

been published and/or distributed for use through a company or organization. Programs include Read 180, Everyday Math, or Second Step, among others.

Research-based practice – instructional practices that are supported by research findings of some sort that have greater empirical support than best and effective practices but do not have the level of empirical support necessary to become an evidence-based practice (Cook, Smith, & Tankersley, 2012).

Scientifically based research – as defined in NCLB (2001), this is research that involves the application of rigorous, systematic, and objective procedures to obtain reliable and valid knowledge relevant to education activities and programs (NCLB, 2001, § 9101).

Students with disabilities – all students who have been diagnosed with one or more of the 13 disabilities defined in IDEA, including: autism, deaf-blindness, deafness, emotional disturbance, hearing impairment, intellectual disability, multiple disabilities, orthopedic impairment, other health impairment, specific learning disability, speech or language impairment, traumatic brain injury, and visual impairment.

Significance of the Study

EBPs have a well-established place in the fields of medicine, nursing and clinical psychology, and they are gaining importance in special education and education as a whole as well. Due to legal mandates set forth in the Every Student Succeeds Act (2015), it is clear that research is gaining significance in the educational decision-making process at a national level. As these mandates begin to trickle down and gain acceptance at the local level, educators will have no choice but to utilize EBPs in the classroom. Many educators still believe that research should not take the place of professional judgment when it comes to determining what is best for students, and therefore, they are reluctant to adopt EBPs in their classrooms. But, research has

proven that EBPs offer students the best opportunity to demonstrate meaningful gains in the classroom. However, in order for EBPs to positively affect student performance, they must be appropriately selected and implemented with fidelity. Unfortunately, due to the current attitudes held by many educators, and the lack of clarity among teachers when it comes to accessing EBPs, appropriate selection and implementation are unlikely to occur until more work is done to build an infrastructure to support the identification and use of these practices. While research has begun to identify ways to support teachers' implementation of EBPs through practices such as coaching, the research-to-practice gap will remain until educators are given the tools necessary to locate and interpret appropriate EBP research for themselves.

This dissertation study aims to identify teachers' knowledge, use, and opinions of online EPB resource centers in order to determine whether these tools represent a useful means through which the research-to-practice gap can begin to close.

Chapter II

Literature Review

This literature review will explore the concept of EBPs for students with LD. Information will be presented in seven main sections. In section one, I will focus on the historical events and legislation that have led to the mandated use of research in determining instructional practices. In section two, I will explain the different processes in use to identify high-quality research and how this research is applied to the identification of EBPs for students with LD. Section three will introduce the leading ORCs where EBPs for students with LD can be found. In section four, I will present the 6S Model (DiCenso, Bayley, & Haynes, 2009; Santangelo, Novosel, Cook, & Gapsis, 2015), a suggested model for teachers to use in the identification and implementation of appropriate EBPs. In section five, I will discuss how EBPs are currently influencing classroom practice, teachers' reported knowledge and use of EBPs, and their attitudes towards educational research. Section six will detail the issue of the research-to-practice gap that affects the implementation of EBPs. Section seven will discuss the concept of knowledge translation in the health sciences and its potential application to education. In conclusion, I will present the current need to evaluate teachers' use of available EBP resources for students with LD to improve knowledge translation and classroom practice in education, leading to the research questions for this research study.

Section 1: Legal Mandates for Research-Based Education

The legal history of educational policy is long and complex (Yell, Rogers, & Rogers, 1998). Throughout this history, many different pieces of legislation have come together to ensure that students with disabilities¹ receive the same, high-quality education as their

¹ In Section 1, the phrase students with disabilities is used to designate students with all types of disabilities including LD.

nondisabled peers. While students with disabilities today are afforded equal access to education as their peers without disabilities, this has not always been the case. Prior to the compulsory education laws of the late 19th and early 20th centuries, students with disabilities were not even guaranteed an education at all. Despite the passage of compulsory education laws, students with disabilities continued to be denied access to education until the mid-1970s when two significant acts were signed into legislation. The first of these was Section 504 of the Rehabilitation Act of 1973. Section 504 mandates that people with disabilities cannot be excluded from participation in programs that receive federal funding, including public education. Yet another critical piece of legislation came in 1975 with the issuance of the Education for All Handicapped Children Act (also known as P.L. 94-142). The Education for All Handicapped Children Act mandated that “students with disabilities had the right to (a) nondiscriminatory testing, evaluation, and placement procedures; (b) be educated in the least restrictive environment; (c) procedural due process, including parent involvement; (d) a free education; and (e) an appropriate education” (Yell et al., 1998, p. 12). The concepts of least restrictive environment and a free and appropriate education remain critical concepts in special education law today. Not only did the Education for All Handicapped Children Act bring about important and lasting ideas in special education, but it also mandated the use of educational research in the development of programs for students with disabilities. Specifically, the act called for “effective procedures for acquiring and disseminating to teachers and administrators of programs for handicapped children significant information derived from educational research” (Education for All Handicapped Children Act, 1975, § 613). This call for the use of educational research set the groundwork for later laws to mandate the use of research in the education of students with disabilities, including LD.

Individuals with Disabilities Education Improvement Act. In 1990, the Education for All Handicapped Children Act was renamed as the Individuals with Disabilities Education Act (IDEA; Yell et al., 1998). President Clinton reauthorized IDEA in 1997 with amendments that mandated the participation of students with disabilities in state and local assessments. The amendments also made changes to the Individualized Education Program (IEP) goals section and to the handling of discipline for students with disabilities. Another reauthorization of IDEA took place in 2004, changing the name to the Individuals with Disabilities Education Improvement Act (IDEIA, 2004). IDEIA (2004) states that, “special education and related services and supplementary aids and services [be] based on peer-reviewed research to the extent practicable” (IDEIA, 2004, §614). Throughout IDEIA, 2004, there are repeated references to “scientifically-based” research and practices, though the text of the law gives no definition of what is meant by scientifically-based research. Specifically, the law requires the use of scientifically-based practices in academic instruction, early literacy, reading, and behavioral interventions. Additionally, the law mandates scientifically-based research be used in professional development to provide teachers and administrators with the necessary knowledge and skills to best support the students in their schools and classrooms. While not going as far as to mandate the use of EBPs, IDEIA does require teachers and administrators to use research to determine practice. Since students with disabilities require the most effective instructional strategies in order to succeed, this legal mandate to use scientifically-based research is critical to the academic success of such students (Cook et al., 2009).

Ridley School District v. M.R. and J.R. ex rel. E.R. The above mandate in IDEIA (2004) that “special education and related services and supplementary aids and services [be] based on peer-reviewed research to the extent practicable” (IDEIA, 2004, §614), was challenged

in 2012 in the *Ridley School District v. M.R. and J.R. ex rel. E.R.* court case. In this case, the parents of a second-grade student with LD and other health related concerns filed a due process complaint against the Ridley School District alleging the district failed to identify their child for special education services in a timely manner, did not propose an appropriate IEP, and discriminated against her under Section 504 of the Rehabilitation Act (Yell, Katsiyannis, Losinski, & Marshall, 2016). The parents claimed the district's proposed reading program, Project Read, was inadequate because it was not validated through peer-reviewed research. In the due process hearing, the impartial hearing officer found in favor of the parents on grounds that the proposed IEP failed to provide a free, appropriate public education (FAPE) because the reading program was not supported by peer-reviewed research. The school district appealed this decision in federal district court, and it was overturned. The district court judge declared that Project Read was validated through peer-reviewed research. Further, the U.S. Court of Appeals upheld the district court decision that Project Read was a peer-reviewed program. In the appeals court decision, it was determined that "IDEA does not require the school district to choose the program supported by the optimal level of research as long as the program is 'calculated to enable the child to receive meaningful education benefit'" (Yell et al., 2016, p. 255). This case is significant for upholding the mandate in IDEA that special education services be grounded in research, and also for setting the precedent for the courts to consider the research behind proposed practices when determining FAPE.

No Child Left Behind Act. Another seminal law related to the mandate for using scientifically-based research to guide instructional decisions for all students – including those with disabilities – is the No Child Left Behind Act (NCLB). NCLB (2001) defined scientifically-based research as "research that involves the application of rigorous, systematic,

and objective procedures to obtain reliable and valid knowledge relevant to education activities and programs” (NCLB, 2001, § 9101). The phrase “scientifically-based research” is mentioned over 100 times throughout the text of NCLB and is a mandated part of nearly every program outlined in the law (Cook et al., 2009). For example, one goal outlined in section 1115 states that programs under that section shall, “use effective methods and instructional strategies that are based on scientifically-based research that strengthens the core academic program of the school” (NCLB, 2001, § 1115). This type of language appears throughout the law relating to programs for school improvement, English language learners, economically disadvantaged students, and many other groups (NCLB, 2001).

Every Student Succeeds Act. NCLB was reauthorized on December 10, 2015 and renamed the Every Student Succeeds Act (ESSA; US Dept. of Education, 2015). ESSA builds upon the mandate established in NCLB for using scientifically-based research to determine educational practices; however, the language and intention of ESSA also differs from its predecessor in several important ways (Pak, 2016). In ESSA, the phrase “evidence-based” appears 70 times, where it did not appear at all in NCLB. Similarly, the phrase “scientifically-based” appears just twice in ESSA, but was referenced 119 times in the previous authorization. For the first time in educational policy, ESSA defines the term ‘evidence-based’ as “an activity, strategy, or intervention that demonstrates a statistically significant effect on improving student outcomes or demonstrates a rationale based on high-quality research findings that such an activity, strategy, or intervention is likely to improve student outcomes or other relevant outcomes” (ESSA, 2015, §8002). Though the term ‘scientifically-based’ was defined in NCLB, the definition lacked clarity, and thus, the inclusion of the term did little to shape school practice. This definition is not only clear in what constitutes an evidence-based practice, it also recognizes

that not all forms of evidence are equal by giving tiers of evidence similar to those which will be discussed in the following section on identification of high-quality research.

Response to Legal Mandates. In response to the mandates in IDEIA and NCLB, several organizations began establishing ORCs where teams of researchers identify and catalogue instructional practices that are backed by sound research, including EBPs. Preeminent among such ORCs is the WWC, founded in 2002 and funded through the U.S. Department of Education's Institute of Educational Sciences. The WWC publishes evidence reviews for various target areas of education, including students with LD (Trybus, 2007). The WWC and several other ORCs that will be discussed in more detail in a later section offer a vast amount of information to teachers and administrators related to EBPs and can aid the process of instructional decision-making. These ORCs do the important work of identifying high-quality, pre-appraised research evidence for teachers, so that they need not rely on their own knowledge of educational research to make practice decisions.

Section 2: Identification of High-quality Research Evidence for Use in Identifying EBPs

The policies set forth in IDEIA, NCLB, and ESSA have the potential to bring about changes in the way educational research is applied to practice (Slavin, 2002). The progressive, systematic improvement that has been characteristic in fields such as medicine, agriculture, and technology could begin to arise in education as well. In 2002, Slavin stated that, "applications of the findings of educational research remain haphazard, and that evidence is respected only occasionally, and only if it happens to correspond to current educational or political fashions" (p. 16). With the 2015 passage of ESSA, the political fashions to which Slavin refers are beginning to change.

Development of Quality Indicators for Research. Since IDEIA and NCLB mandated that classroom instruction be grounded in scientifically-based research, teams of experts in special education research have worked to establish guidelines that can be universally applied to published studies in order to identify high-quality research for use in identifying EBPs. In January 2003, the Council for Exceptional Children's (CEC) Division for Research, assembled a task force to determine the different types of research questions and methodologies that can best answer the pertinent issues in special education (Odom, Brantlinger, Gersten, Horner, Thompson, & Harris, 2005). The task force identified four separate research methodologies in special education: (a) experimental group, (b) correlational, (c) single subject, and (d) qualitative designs. After identifying the relevant methodologies, the task force then set out to identify quality indicators for each methodology and to determine how evidence from each methodology could be applied to the identification of effective practices in special education. Four research teams were assembled to address the four different research methodologies. Their findings were published in a special edition of the journal *Exceptional Children* in 2005.

For each of the four methodologies, quality indicators and guidelines for how the methodology contributes evidence for the effectiveness of practices in special education were developed (Odom et al., 2005). Quality indicators are the features of research that represent the rigorous application of methodology. Quality indicators can be used by researchers to design high-quality research studies, by reviewers to evaluate the believability of research findings, and by practitioners to determine the usability of research findings. When a greater number of quality indicators are represented in a study, researchers and practitioners can place greater confidence in the research findings. In similar fashion to the quality indicators and guidelines laid out by these research teams, ORCs and other academic organizations have also begun to

create standards that can be used to identify high-quality research evidence that can then be applied to the identification of EBPs.

While each of the four methodologies can contribute to the identification of high-quality research, the two most pertinent to the identification of EBPs in special education are experimental and single subject designs (Odom et al., 2005). True random experiments represent the gold standard for research methodology that can address questions of effectiveness. However, in the field of special education, single-subject research may be a better fit than an experimental design and can still address the question of effectiveness. Therefore, when true random experiments are not available, single subject designs or quasi-experimental designs are used. The process of applying these quality indicators to research studies will be explored in more detail after the quality indicators are presented.

Quality Indicators for Experimental and Quasi-Experimental Research. The research team of Gersten, Fuchs, Compton, Coyne, Greenwood, and Innocenti (2005) identified quality indicators for experimental and quasi-experimental research. They presented a set of essential quality indicators in four different areas: describing participants, implementation of the intervention and description of comparison conditions, outcome measures, and data analysis (see Table 1; Gersten et al., 2005). Each of these categories included a number of subtopics for a total of 10 separate quality indicators. In addition to these 10 essential quality indicators, Gersten et al. (2005) also proposed eight desirable quality indicators to be included when identifying high-quality research. According to Gersten's (2005) team, a study must meet all but one of the essential quality indicators and at least four of the desirable quality indicators in order to be considered high-quality research. To be considered acceptable quality, a research study

must meet all but one of the essential quality indicators and at least one of the desirable quality indicators.

Quality Indicators for Single-Subject Research. Horner, Carr, Halle, McGee, Odom, and Wolery (2005) comprised the team of experts who identified quality indicators for application to single-subject research. Horner et al. (2005) presented quality indicators within seven areas of focus, including: description of participants and settings, dependent variable, independent variable, baseline, experimental control/internal validity, external validity, and social validity (see Table 2). As with Gersten et al.'s (2005) criteria, each category had a number of subtopics that focus on specific criteria. Unlike Gersten's team, Horner et al. (2005) do not differentiate between essential and desirable quality indicators or specify how many of the quality indicators must be met for research to be considered high-quality. Rather, Horner et al.'s (2005) standards document a practice as evidence-based when it meets five specific criteria which will be described in the following section on Application of the Quality Indicators.

Application of the Quality Indicators. The quality indicators and guidelines laid out by Gersten et al. (2005) and Horner et al. (2005) set the groundwork for developing criteria in the field of special education to determine EBPs, including EBPs for students with LD. In order to be considered an EBP through group experimental research, the extant literature must include at least four acceptable, or two high-quality experimental studies, and the weighted effect size must be greater than zero (Gersten et al., 2005). With regard to the identification of EBPs when utilizing single-subject research, Horner et al. (2005) proposed:

Single-subject research documents a practice as evidence-based when (a) the practice is operationally defined; (b) the context in which the practice is to be used is defined; (c) the practice is implemented with fidelity; (d) results from single-subject research document

the practice to be functionally related to change in dependent measures; and (e) the experimental effects are replicated across a sufficient number of studies, researchers, and participants to allow confidence in the findings. (pp. 175-176)

More specifically, for the fifth criteria listed above, a practice may be considered evidence-based if at least five studies meet minimally acceptable methodological criteria and document experimental control, the studies are conducted by at least three different researchers from three different locations, and the five or more studies include at least 20 subjects. Research studies identified as high-quality using these criteria can then be used by ORCs and other scholarly organizations to identify EBPs. However, despite the identification of these quality indicators, each individual ORC establishes their own set of guidelines to use in the identification of EBPs. You will read more about each method in the forthcoming section on ORCs.

In a later special issue of *Exceptional Children* published in the spring of 2009, the guidelines presented above were applied to the evaluation of five instructional practices for students with disabilities (Graham, 2009). The five studies representing the application of Gersten et al.'s (2005) quality indicators for experimental research and Horner et al.'s (2005) quality indicators for single-subject research are discussed in more detail below to illustrate the process by which the quality indicators can be used in the identification of EBPs. The studies are presented alphabetically by primary author with a description of methods, findings, and authors' reflection on the process of applying the quality indicators being provided for each review. The author's reflection presents the author's thoughts as stated in each article.

Baker, Chard, Ketterlin-Geller, Apichatabutra, and Doabler, 2009. Baker et al. (2009), applied the quality indicators for group-experimental/quasi-experimental research and single-subject research to evaluate the quality of the research evidence for a writing intervention called

Self-Regulated Strategy Development (SRSD). SRSD is a writing intervention that focuses on the role of self-regulation in the development of written works.

Method: The research team carried out its work in four phases:

(a) identifying intervention studies on SRSD in writing with students with LD or at-risk for LD; (b) screening the studies to ensure they met inclusion criteria; (c) development, refinement, and application of a quality indicator rubric, based on published standards, for evaluating the methodological quality of the studies; and (d) application of published quality indicators and standards to determine whether the studies were of sufficient quality to deem SRSD an EBP. (Baker et al., 2009, p. 306)

In phase 1, in order to identify studies focused on SRSD in writing, the researchers implemented a thorough, three-step search process (Baker et al., 2009). They first searched scholarly databases using defined search terms. Next, they conducted an ancestral search using the reference lists from three secondary sources. Finally, they conducted a hand search of recent literature in major journals of special, remedial, elementary, and secondary education. This search process identified 49 research articles pertaining to SRSD in writing. Of these, 21 studies met the inclusion criteria for their analysis developed in phase two of the research process.

Following the identification of studies for inclusion in their analysis, in phase 3, the research team developed a four-point rubric for each research design on which to evaluate the proposed quality indicators (Baker et al., 2009). Prior to rating the studies for the final review, the research team practiced applying the rubric to two studies in order to identify any ambiguities. Once the final rubric was agreed upon, two independent reviewers reviewed each of the 21 studies, and scores were aggregated across components to generate a single score for each quality indicator. “A study met the overall quality indicator if it (a) received a minimum

mean score across two reviewers of 3 or better averaged across the components for that specific quality indicator and (b) received no component score of 1 from either reviewer” (Baker et al., 2009, p. 308).

Phase 4 of Baker et al.’s (2009) practice determined whether the 21 studies were of sufficient quality to deem SRSD an EBP. Five of the studies evaluated employed an experimental or quasi-experimental research design, and the remaining 16 employed a single-subject design.

Results: All five of the group experimental and quasi-experimental SRSD studies met the standards for high-quality research proposed by Gersten et al. (2005), each meeting all but one of the essential quality indicators (Baker et al., 2009). All five studies also provided adequate evidence of at least four desirable quality indicators. The effect sizes for the group experimental/quasi-experimental studies ranged from 0.80 to 1.85. Therefore, SRSD meets the evidence standards for being evidence-based. Of the 16 single-subject studies reviewed, nine earned a mean score of 3 or above in each of the seven quality indicator categories, and earned no component scores of 1. Additionally, these nine studies were conducted by at least three different researchers across three different geographical locations and had at least 20 total participants. Therefore, Baker et al. (2009) concluded SRSD also met the single-subject criteria to be evidence-based.

Authors’ reflection: Baker et al. (2009) identified the measurement of the quality indicators as a challenge in their application of the standards. While Gersten et al. (2005) and Horner et al. (2005) are specific in what constitutes a high-quality study, they do not indicate how to measure the presence or absence of each indicator. Baker et al. (2009) determined that rather than creating a dichotomous rating scheme, a four-point rating scale would more

accurately represent the presence of the essential quality indicators. Many of the studies they reviewed contained only partial descriptions of the quality indicators.

Browder, Ahlgrim-Dezell, Spooner, Mims, and Baker, 2009. Browder et al. (2009) applied the quality indicators for single-subject research to studies of the application of Time Delay as an instructional procedure to teach word and picture recognition to students with severe developmental disabilities.

Method: Browder et al.'s (2009) literature search began with a list of articles identified in a literature review on teaching reading to individuals with significant cognitive disabilities conducted by Browder et al. (2006), and yielded 24 experiments that used Time Delay for sight word instruction. Additional studies were identified through an expanded search process using terms related to Time Delay. After meeting initial inclusion criteria, each identified article also underwent a second round of review to ensure the study focused on a Time Delay intervention. A total of 99 new articles were located and reviewed. Ninety-three studies were excluded for not meeting specific inclusion criteria, resulting in the identification of six additional experiments. These were added to the original 24 studies for a total of 30 experiments in this study.

Browder et al. (2009) considered each methodological component of the seven quality indicators for single-subject research designed by Horner et al. (2005) to be essential (Browder et al., 2009). Therefore, if one component was not met, the entire quality indicator was not met. Specific definitions and clarifications of the quality indicators and methodological components were developed for the purpose of this review. A coding form was developed including the Time Delay indicators, study characteristics, and quality indicators. A second-year doctoral student and a second individual each coded the first five articles independently, and then compared results to determine common definitions and applications of the coding form. Once

initial agreement was obtained, the primary coder recoded the first five experiments and all additional experiments.

Results: Of the 30 studies included in Browder et al.'s (2009) review, 22 were found to meet all seven quality indicators of single-subject research. Therefore, Time Delay met the minimum requirement of five high-quality studies. A total of 41 authors contributed to this body of work, though four main groups of authors published the majority of the articles. However, these findings still exceeded the minimum requirement of three different groups of authors presented by Horner et al. (2005). The locations of the studies represented five different states with 66 total participants across all studies (Browder et al., 2009). Therefore, this review determined that Time Delay met the criteria to be an EBP. Additionally, there were a sufficient number of studies representing each type of Time Delay (constant Time Delay and progressive Time Delay) to determine that each sub-type was, in fact, an EBP.

Authors' reflection: Browder et al. (2009) proposed an additional question be added to those proposed by Horner et al. (2005) when using the quality indicators to identify EBPs: "How does the literature compare with the theoretical foundations for the practice?" Additionally, Browder et al. (2009) suggest that the first step in identifying any practice as an EBP should be to develop a comprehensive definition of the practice to be used during the review. This ensures that any studies under review are focused on the target intervention as defined by the research team. Like Baker et al. (2009), Browder et al. (2009) also found that they were able to operationalize each of the quality indicators based on their own intents rather than using prescribed definitions set by the original researchers. The research team had to make the difficult decision whether to require the presence of all criteria (dichotomous rating) in order to meet each quality indicator, or to adopt a scale similar to that designed by Baker et al. (2009).

Most of the eliminated studies missed inclusion by only one indicator. The more rigorous the application of the indicators, the more confidence can be placed in the findings.

Chard, Ketterlin-Geller, Baker, Doabler, and Apichatabutra, 2009. Chard et al. (2009) applied the quality indicators for group-experimental and quasi-experimental designs and those for single-subject designs to evaluate the use of Repeated Reading interventions for students with learning disabilities. Chard et al. (2009) defined Repeated Reading as “any intervention procedure that requires students to read passages in connected text or word lists more than once” (p. 266). Repeated Reading was selected due to its well-documented history in research literature, its application to students with disabilities, including those with LD, and the fact that several literature syntheses and meta-analyses documenting strong effect sizes have been published on the topic. Though meta-analytic research has already demonstrated the effectiveness of Repeated Reading, it has not been evaluated using the rigorous application of quality indicators needed to earn a rating of evidence-based.

Method: Chard et al.’s (2009) research process started with the identification of studies of Repeated Reading interventions. Prior to conducting the literature search, the research team developed a priori criteria for what would qualify as a Repeated Reading intervention. An intervention was eligible if students were required to read connected texts or word lists more than once with the intention of improving rate and accuracy, and the intervention did not include components related to other reading skills such as comprehension or vocabulary development. The first step in identification of relevant studies was an exhaustive search of electronic databases for relevant articles published between January, 1975 and December, 2006. Next, the research team conducted an ancestral search using the reference lists of several pertinent studies. Finally, the team conducted a manual search of relevant, major academic journals from 2004 to

2006. This three-tiered search process resulted in the identification of 92 articles pertaining to Repeated Reading. After applying inclusion criteria, 11 studies were identified for inclusion in the review.

Following the recommendations by Horner et al. (2005) and Gersten et al. (2005), Chard et al. (2009) created rubrics to evaluate the methodological rigor of the studies. The rubrics rated each of the essential quality indicators for high-quality research recommended by the original research teams on a 4-point continuum. This Likert scale rating system was adopted in place of a dichotomous rating in order to capture the varying degrees to which methodological standards were met. Members of the research team who were not involved in the development of the rubrics evaluated them to ensure proper alignment with the quality indicators proposed by Horner et al. (2005) and Gersten et al. (2005). The rubrics were also applied to sample studies in order to establish consistency of ratings across evaluators.

Results: Six of the qualifying studies were of a single-subject research design (Chard et al., 2009). None of these studies met the minimum requirements for rigorous research in all seven quality indicators. Based on the criteria proposed by Horner et al. (2005), these studies do not provide sufficient evidence of methodological rigor. Because no studies qualified as high-quality single-subject research, Repeated Reading does not qualify as an EBP for students with LD.

The remaining five studies were of experimental or quasi-experimental research designs (Chard et al., 2009). Only one of the reviewed studies provided acceptable documentation of methodological rigor across all four categories. Because only one study was found to demonstrate sufficient evidence of methodological rigor, one additional high-quality study with

an effect size significantly greater than zero would be needed in order to classify Repeated Reading as an EBP based on the experimental and quasi-experimental research.

Authors' reflection: Chard et al. (2009) indicated that the prior consensus in special education literature would likely have identified Repeated Reading as an EBP. However, the findings of this review indicate otherwise. The researchers believed the methodological rigor of the single-subject studies evaluated for this review was lacking in several areas including the description of participant selection, descriptions of measurement validity, and measures of implementation fidelity, among others. This suggests that, overall, the single-subject research on Repeated Reading needs to be more rigorous. Several issues were consistent across the experimental research as well. These included limited information about interventionists, omitted details about students' disability categories, and limited reporting on implementation fidelity.

Chard et al. (2009) believe that moving forward, it will be important to encourage researchers to publish studies that strive to meet the criteria set forth by Horner et al. (2005) and Gersten et al. (2005). The researchers stated that the application of a dichotomous rating scale, rather than using a rubric, would have resulted in the identification of a greater number of high-quality studies. However, the researchers believe that their approach likely overestimated the quality of the research rather than underestimated it (Chard et al., 2009). While the criteria for high-quality research are rigorous, the authors believe that they represent the fundamental features of research and do not set the bar too high.

Lane, Kalberg, and Shepcaro, 2009. Lane and colleagues (2009) applied the quality indicators for single-subject research developed by Horner et al. (2005) to the literature on

Function-Based Interventions for Secondary Students with Emotional and/or Behavioral Disorders (EBD).

Method: Lane et al.'s (2009) evaluation process began with a systematic search of psychological and educational databases to identify studies on Function-Based Interventions for Secondary Students with EBD. Following the search of databases, the researchers conducted a hand search of journals in which had previously published relevant studies in order to identify additional studies. This process identified 33 potential studies for further review, all of which employed a single-subject design. Of the initial 33 studies identified through the search procedures, 12 studies met the inclusion criteria defined by the research team.

Each study was coded independently by the first and third authors on 21 components aligned to the seven quality indicators described by Horner et al. (2009; Lane et al., 2009). Each criterion was coded as being either present or absent. Following the coding process, the five standards for an EBP proposed by Horner et al. (2009) were applied to the body of literature to determine if the practice is evidence-based.

Results: Only one of the qualifying studies met all seven quality indicators (Lane, et al., 2009). Across studies, the number of quality indicators met in entirety ranged from zero to seven. One study met four indicators, two studies met three indicators, one study met two indicators, and four studies met one indicator. According to the standards set forth by Horner et al. (2005), Function-Based Interventions for Secondary Students with EBD does not meet EBP standards.

Authors' reflection: Lane et al. (2009) found that although all studies met their inclusion criteria, there was variability in the specific functional tools applied, student characteristics, and instructional settings. Additionally, the students included in the reviewed studies exhibited

different facets of EBD. Therefore, the researchers determined that even if Function-Based Interventions for Secondary Students with EBD had qualified as an EBP, more research would still be needed to determine for whom each individual intervention is best suited. The authors of this review contend that the standards presented by Horner et al. (2009) may be too rigorous. Specifically, they propose that the requirements for describing participants, establishing repeated measurement of the dependent variable, repeated measurement and established pattern for baseline, and stating cost-effectiveness as a component of the social validity indicators may need to be revised to a lower standard. The authors suggest that instead of a 100% standard, perhaps an 80% minimum criteria for each indicator could be more appropriate for single-subject studies.

Montague and Dietz, 2009. The research team of Montague and Dietz (2009) applied the quality indicators proposed by Horner et al. (2005) and Gersten et al. (2005) to five single-subject and two group experimental studies exploring the effects of Cognitive Strategy Instruction on the mathematical problem solving of students with disabilities.

Method: Montague and Dietz (2009) began their review by conducting a literature search of the PsycINFO and Education Full Text electronic databases from 1969 to 2006 and examining the reference lists of articles found through this search. This process resulted in 42 potential studies for inclusion in this review. Of these 42 potential studies, seven met all criteria for inclusion. Five studies used a single-subject design, and two studies used a group experimental design. The majority of excluded studies did not meet the definition for cognitive strategy instruction.

Each study was reviewed by three independent raters using a list of questions developed based on the quality indicators presented by Horner et al. (2005) and Gersten et al. (2005; Montague & Dietz, 2009). These questions generated a dichotomous yes/no response for each

quality indicator. In areas where more than one component was included in a single indicator, the components were rated independently. Final ratings for items on which all three raters did not agree reflected the ratings of the two raters in agreement.

Results: All five single-subject studies failed to meet the quality indicators for dependent and independent variables, and none measured treatment fidelity (Montague & Dietz, 2009). Additionally, four of the five studies did not sufficiently report interrater agreement. Based on these results, Cognitive Strategy Instruction does not meet the proposed EBP standards to improve mathematical problem solving for students with disabilities. Neither of the group-experimental studies addressed the required three out of four essential quality indicators. The studies were not reviewed for the presence of the eight desirable indicators and weighted effect size was not calculated. Because neither study was of high- or acceptable-quality according to the standards proposed by Gersten et al. (2005), Cognitive Strategy Instruction in math for students with disabilities cannot be considered an EBP.

Authors' reflection: Apparent in Montague and Dietz's (2009) review were issues related to the reporting of reliability of the outcome measures, treatment fidelity, establishing baseline performance, and reporting of effect sizes. The studies under review were primarily conducted in the 1990s when methodological guidelines were not as rigorous as they are today. The authors agreed that applying such stringent standards might require some additional clarification. Additionally, the authors questioned the relative importance of the desirable quality indicators. While it was clear that the essential quality indicators were all of equal importance, since all had to be met for a study to be considered high-quality, it was not clear to the authors why one could pick and choose from among the desirable quality indicators. The authors believed that the inability to rate Cognitive Strategy Instruction as an EBP for improving mathematical problem

solving was due in large part to the fact that the original research was conducted long before standards for acceptable research methodology were known in the field of educational research. They believe that if research that is more current were to be added to the review, this rating could potentially change.

Summary of the 2009 Exceptional Children reviews. Based on the systematic reviews conducted by the five research teams, it was determined that SRSD and Time Delay can be considered EBPs (Baker et al., 2009; Browder et al., 2009). Repeated Reading, Function-Based Interventions for Secondary Students with EBD, and Cognitive Strategy Instruction did not meet criteria to be considered EBPs (Chard et al., 2009; Lane et al., 2009; Montague & Dietz, 2009).

The above studies demonstrate how the quality indicators identified by Gersten et al. (2005) and Horner et al. (2005) can be applied to the identification of EBPs for students with disabilities, including those with LD. As the researchers on these review teams described, these quality indicators are not without issue. Among the insights offered by each of the five research teams, two themes emerged. First, research teams reported that the quality indicators were overly stringent and limited their ability to identify practices commonly accepted as effective as EBPs (Lane et al., 2009; Montague & Dietz, 2009). Additionally, other authors found it necessary to interpret the suggestions made by Gersten et al. (2005) and Horner et al. (2005) and adapt the application of the quality indicators to meet their teams' research purpose (Baker et al., 2009; Chard et al., 2009). Though the guidelines set forth by Gersten et al. (2005) and Horner et al. (2005) were not without criticism, they do represent a move towards a clear and consistent set of standards which can be applied to the identification of EBPs. However, there remain other obstacles in place which must be overcome before EBPs will be universally accepted into classroom practice.

Despite the mandates laid out in IDEIA and ESSA for teachers to use scientifically-based research to guide their instructional practices; many teachers continue to question what this really means. Due to the fact that each ORC uses a different set of standards, the same practice can be rated as evidence-based in one case, but not in another (Cook et al., 2012). Unfortunately, this can lead to confusion among teachers, as you will see in greater detail in the section on Reported Use and Opinions of EBPs and Research in Special Education, and points to the potential benefit of adopting a universal set of standards. Despite these shortcomings, the ORCs still provide a wealth of information that teachers can access, free of charge, to help identify EBPs and Research-Based Practices (RBPs) for use in the classroom. In the following section, you will be introduced to five such ORCs that publish resources for students with LD.

Section 3: Online Resource Centers

Since the legal mandates set forth in ESSA and its predecessors created a need for educational practices which are grounded in high-quality research, ORCs have emerged as a tool which teachers can turn to in order to identify EBPs and other RBPs for use in the classroom (Powers, Bowen, & Bowen, 2011). Through these ORCs, teachers can gain access to pre-appraised research evidence on instructional practices. Each of the ORCs hosts a different body of research evidence, though there is some overlap across sites. A number of these ORCs exist, but not all include resources² for students with LD. Five ORCs which include reviews of practices which have been studied including students with LD in the samples are the Alerts Series, the Best Evidence Encyclopedia (BEE), the National Center on Intensive Intervention (NCII), the National Technical Assistance Center on Transition (NTACT), and the WWC (Santangelo, Ruhaak, Kama, & Cook, 2013; Santangelo et al. 2015). While not every resource

² In Section 3, the term resource will refer to any materials that have been pre-appraised or evaluated through systematic review. This term does not include professional materials such as lesson plans or classroom activities which have not undergone systematic review.

available through these ORCs is applicable to students with LD, these five centers are the primary sources of free, online information about EBPs for students with LD. Table 3 provides a summary of the resources available at each ORC that are applicable to students with LD. In the following sections, I will provide more detail on each of these five ORCs. For each center, I will detail general information about the purpose, affiliations, and funding, available resources, and the evaluation processes and procedures used by each center so that the reader can become familiar with how and why each center reviews each practice or program. The five ORCs that will be the focus of this study will be presented below in alphabetical order. I will present only the resources available at each ORC applicable to students with LD.

Alerts Series.

Affiliations and funding. The Alerts series is published through a joint initiative sponsored by two divisions of CEC—the Division for Learning Disabilities and the Division for Research. CEC is a professional organization committed to improving the education of students with disabilities and special talents or gifts (CEC, n.d.). The Alerts Series is intended to provide practitioners and parents with an objective, independent, and authoritative review of what is known about practices and programs intended for students with LD. These Alerts can be used by parents and practitioners as a way to review the available options for instructing students with LD.

Available resources. As of April, 2017, Alerts have been published for 26 different practices and programs (Teaching LD, n.d.). Each Alert has a consistent format including nine sections. These sections are: 1) What Is It? 2) For Whom Is It Intended? 3) How Does It Work? 4) How Adequate Is The Research Knowledge Base? 5) How Practical Is It? 6) How Effective Is

It? 7) What Questions Remain? 8) How Do I Learn More? and 9) About The Authors (Alerts Series: Alert 1, 1999).

As of April, 2017, 20 practices and programs have earned the “Go For It” rating, explained below (Teaching LD, n.d.). These include Class-Wide Peer Tutoring, Cognitive Strategy Instruction, Collaborative Strategic Reading, Content Enhancement Routines, Direct Instruction, Explicit Instruction in Math, Fluency Instruction, Formative Evaluation, Functional Behavioral Assessment, Graphic Organizers, Mnemonic Instruction, Peer-Mediated Instruction for Secondary Students, Phonics Instruction, Phonological Awareness, Self-Determined Learning Model of Instruction, Self-Regulated Strategy Development, Strategy Instruction that Primes the Problem Structure, Reading Comprehension Instruction, the Alerts Series, and Vocabulary Instruction. An additional six practices have earned the “Use Caution” rating, including Cooperative Learning, Co-Teaching, High-Stakes Assessment, Learning Styles, Reading Recovery, and Social Skills Instruction.

Evaluation protocols. Each Alert is prepared based on a rigorous review process which has been designed and maintained by CEC (Alerts Series: Alert 1, 1999). This process was created in order to assure the rigor, objectivity, and validity of reviews. No specific protocol or guidelines are published outlining this process. The professional judgment of the review team is used to determine the evidence rating given. Each Alert offers one of two recommendations based on the level of supporting evidence for each practice. The “Go For It” rating is given to practices and programs for which there is solid research evidence of effectiveness. A rating of “Use Caution” is given to practices and programs for which the research evidence is preliminary, incomplete, mixed, or negative.

Best Evidence Encyclopedia.

Purpose, affiliations, and funding. The BEE was created by the Johns Hopkins University School of Education's Center for Data-Driven Reform in Education and receives funding from the U.S. Department of Education's Institute of Education Sciences (BEE, n.d.). The purpose of the BEE is to give teachers and researchers fair and useful information about the strength of the evidence supporting a variety of practices and programs available for students in grades K-12.

Available resources. The BEE has three types of resources (BEE, n.d.). Program Reviews (full reports) are meta-analyses or other quantitative syntheses that apply consistent, scientific standards to bodies of evidence that both meet high standards of methodological quality and evaluate realistic implementations of practices and programs currently available to teachers. Two additional resources available on the BEE's website are Educator's Summaries and Educator's Guides, each of which present information from the Program Review in a more practitioner friendly format. The Educator's Summary provides a quick look at information about practices and programs reviewed on the BEE. This includes evidence of effectiveness ratings, program descriptions, links to full reports, and contact information. Finally, an Educator's Guide is available in some areas of review that includes a more detailed analysis than the Educator's Summary, without the technical language of the Program Review.

The BEE has published one Program Review that involved students with LD in the study samples (BEE, n.d.). This Program Review, entitled *Effective Programs for Struggling Readers: A Best-Evidence Synthesis*, focuses on elementary reading approaches which have been proven to help struggling readers succeed. The review summarizes evidence on six practices and programs designed to improve reading achievement for students who have difficulty learning to

read. These practices and programs include: One-to-One Tutoring by Teachers, One-to-One Tutoring by Paraprofessionals and Volunteers, Small Group Tutorials, Classroom Instructional Process Approaches, Classroom Instructional Process Programs with Tutoring, and Instructional Technology. An Educator's Guide and Educator's Summary are also available for this report.

Evaluation protocols. The BEE uses a detailed set of criteria described below to adapt research syntheses into Best Evidence Program Reviews. According to the BEE website, to be considered for a Program Review, a synthesis must:

1. Consider all studies in their area, and carry out an exhaustive search for all studies that meet well-justified standards of methodological quality and relevance to the issue being reviewed.
2. Present quantitative summaries of evidence on the effectiveness of programs or practices used with students in grades K-12, focusing on achievement outcomes.
3. Focus on studies comparing programs to control groups, with random assignment to conditions or matching on pretests or other variables that indicate that experimental and control groups were equivalent before the treatments began.
4. Summarize program outcomes in terms of effect sizes (experimental-control differences divided by the standard deviation) as well as statistical significance.
5. Focus on studies that took place over periods of at least 12 weeks, to avoid brief, artificial laboratory studies.
6. Focus on studies that used measures that assessed the content studied by control as well as experimental students, to avoid studies that used measures inherent to the experimental treatment. (BEE, n.d.)

The practices and programs included in BEE Program Reviews are given one of five ratings based on the level of evidence which supports the program as follows:

- **Strong Evidence of Effectiveness:** At least one large randomized or randomized quasi-experimental study and one additional large qualifying study, or multiple smaller studies, with a combined sample size of 500 and an overall weighted mean effect size of at least +0.20.
- **Moderate Evidence of Effectiveness:** Two large matched studies, or multiple smaller studies with a collective sample size of 500 students, with a weighted mean effect size of at least +0.20.
- **Limited Evidence of Effectiveness: Strong Evidence of Modest Effects:** Studies meet the criteria for “Moderate Evidence of Effectiveness” except that the weighted mean effect size is +0.10 to +0.19.
- **Limited Evidence of Effectiveness: Weak Evidence with Notable Effect:** A weighted mean effect size of at least +0.20 based on one or more qualifying studies insufficient in number or sample size to meet the criteria for “Moderate Evidence of Effectiveness”.
- **No Qualifying Studies:** No studies met inclusion standards. (BEE, n.d.)

Additional information. Based on my review of the information available on the BEE website, a potential conflict of interest may exist in that some BEE review authors divide their time between Johns Hopkins University and the nonprofit Success for All Foundation. Success for All Foundation practices and programs are reviewed on the BEE. According to the BEE, all practices and programs are reviewed using the same rigorous criteria in order to provide readers with a fair assessment.

National Center on Intensive Intervention.

Purpose, affiliations, and funding. NCII is affiliated with the American Institutes for Research, and works with many of the nation's most distinguished data-based individualization experts (NCII, n.d.). On their website, NCII defines data-based individualization as a research-based process for individualizing and intensifying interventions through the systematic use of assessment data, validated interventions, and research-based adaptation strategies. NCII's mission is to build district and school capacity to support implementation of data-based individualization in reading, mathematics, and behavior for students with severe and persistent learning and behavioral needs. The goal of data-based individualization is to increase student engagement and provide opportunities for students to practice new skills. Within multi-tiered systems of supports such as Response to Intervention or Positive Behavior Interventions and Supports, this is often considered Tier III. NCII is funded by the U.S. Department of Education's Office of Special Education Programs (OSEP) and is part of OSEP's Technical Assistance and Dissemination Network, which provides information and technical assistance to families of students with disabilities.

Available resources. As of April, 2017, NCII has published two sets of Tools Charts that provide detailed information on academic and behavioral interventions and progress monitoring tools to assist teachers and families in becoming informed consumers about intensive interventions (NCII, n.d.). The Academic and Behavioral Tools Charts present information on individual studies that focus on a particular practice or program. Tools Charts can be used by teachers to select interventions and progress monitoring tools that best meet the needs of their students. Each Tools Chart provides a visual representation of the ratings given to various facets of each reviewed study on a given intervention. Data are provided under a number of tabs that

group the information into domains. Each domain of the Tools Chart uses a rating scale of convincing evidence, partially convincing evidence, or unconvincing evidence. These ratings are represented by a fully-colored bubble, half-colored bubble, or empty bubble, respectively.

The Academic Intervention Tools Chart provides data about individual studies that have been conducted on a variety of academic interventions (NCII, n.d.). Information is divided by study quality, study results, intensity, and additional research. Under the study quality tab, the domains of participants, design, fidelity of implementation, measures targeted, and measures broader are rated. Under the study results tab, a brief summary of findings is provided which includes the number of outcome measures, mean effect size, and an indication of whether disaggregated data are available. The intensity tab includes a description of the administration group size, duration of intervention, and minimum interventionist requirements. Finally, the additional research tab indicates whether the study has been evaluated by the WWC and how many additional studies are eligible or ineligible for NCII review.

As of April, 2017, NCII has reviewed 20 studies of academic interventions that included students with LD in their samples. These studies evaluated the following programs: Fast ForWord Language Series, Fraction Face-Off!, Hot Math Tutoring, Lexia Reading, MindPlay Virtual Reading Coach: MindPlay Fluency (two studies), Pirate Math Individual Tutoring, Read Naturally (two studies), Responsive Reading Instruction (two studies), Seeing Stars (two studies), Sound Partners (grades 1-3), Sound Partners (Kindergarten), SRSD for Writing Strategies (two studies), System 44 Next Generation, and Words Their Way: Word Study in Action Developmental Model.

The Behavioral Intervention Tools Chart presents information about studies that have been conducted about behavioral intervention practices and programs. The first tab, study

quality, includes ratings on the technical rigor of the study design. It includes the domains of participants, design, fidelity of implementation, measures targeted, and measures broader. The second tab, study results, includes information about the findings of the studies. Subdomains in this tab include mean effect size targeted outcomes, mean effect size broader outcomes, visual analysis (single-subject designs), and disaggregated outcome data available for demographic subgroups. The third tab, program information, provides information about the intervention including the target behavior and implementation requirements. The subdomains under this tab include target behavior(s), delivery, fidelity of implementation checklist available, and minimum interventionist requirements. The fourth tab, additional research, provides information about other studies and reviews that have been conducted on the intervention and includes the subdomains intervention reviewed by WWC, other research: ineligible for NCII review, and other research: potentially eligible for NCII review.

As of April 2017, NCII has reviewed 15 studies of behavioral interventions which included students with LD in their samples. Practices reviewed include Behavior Education Program or Check-In/Check-Out, Choice as an Antecedent Intervention, Class-Wide Function-Related Intervention Teams, Daily Report Card, Group Contingency, Noncontingent Reinforcement (two studies), Opportunities to Respond, Self-Management (three studies), Skillstreaming, Token Economy (two studies), and Video Modeling.

Evaluation protocols. NCII has a technical review committee for each of their Tools Charts that evaluates the scientific rigor of submitted studies to determine the efficacy of each intervention (NCII, n.d.). NCII publishes a detailed rubric for their protocol available online at <http://www.intensiveintervention.org/sites/default/files/NCIIAcadInterventionRatingRubric2016.pdf>, which outlines the standards that each domain of a reviewed study must meet in order to

earn a full bubble, half bubble, or empty bubble. These domains align with those outlined above for the Academic and Behavior Intervention Tools Charts.

National Technical Assistance Center on Transition.

Purpose, affiliations, and funding. NTACT is a technical assistance and dissemination project, funded by OSEP and the Rehabilitation Services Administration, Cooperative Agreement Number H326E140004 from January 1, 2015 until December 31, 2019 (NTACT, n.d.). NTACT operates in partnership with the University of North Carolina at Charlotte, University of Oregon, Western Michigan University, the Transition Coalition at the University of Kansas, and TransCen, Inc. NTACT's purpose is to assist State Education Agencies, Local Education Agencies, State Vocational Rehabilitation Agencies, and Vocational Rehabilitation service providers in implementing evidence-based and promising practices ensuring students with disabilities, including those with significant disabilities, graduate prepared for success in postsecondary education and employment. NTACT will identify and promote evidence-based and promising practices to:

- a) Increase access, participation and success of students with disabilities in academically rigorous instruction and assessment in preparation for college, career, and community readiness;
- b) Increase access, participation and success of students with disabilities in career related curricula and activities in preparation for college, career, and community readiness;
- c) Improve the provision of additional factors associated with quality transition planning and school completion, such as engagement, leadership, self-advocacy;

- d) Promote collaboration and stakeholder engagement focused on improving college, career, and community success;
- e) Increase the use of data-driven decision making to improve programs and systems that address college, career, and community readiness, as well as use of early warning systems and interventions focused on reducing dropout and increasing graduation rates for students with disabilities; and
- f) Promote use of effective personnel development, coaching, and technical assistance strategies that build state and local capacity to prepare students with disabilities for college, career and community readiness. (NTACT, n.d.)

NTACT's four major activities include (a) knowledge development, (b) technical assistance and dissemination, (c) leadership and coordination, and (d) evaluation. NTACT's technical assistance is offered at universal, targeted (time limited and specific focus), or intensive (sustained for the life of the grant for a select number of states and a corresponding local community) levels.

Available resources. NTACT publishes Practice Descriptions for the effective practices and predictors they have identified. These Practice and Predictor Descriptions categorize each practice or predictor as Evidence-Based, Research-Based, Promising, or Unestablished. The Practice Descriptions provide information on the level of evidence supporting the practice, where to find out more about how to implement the practice, who was involved in the reviewed studies, a description of the practice or predictor itself, information on where the studies were conducted, how the practice relates to Common Core and/or Common Career Technical Core Standards, and references. The Predictor Descriptions do not provide disaggregated data for students with LD, so it is unclear if any of these predictors are applicable to this population.

As of April, 2017, six practices which included students with LD in the evaluated studies have earned a rating of Evidence-Based. These Practice Guides include Using Graphic Organizers to Teach Reading Comprehension, Using Strategy Instruction to Improve Reading Comprehension, Using Strategy Instruction to Teach Math, Using the Self-Determined Learning Model of Instruction to Teach Goal Attainment, Using Published Curricula to Teach Student Involvement in the Individualized Education Program (IEP) Meeting, and Using Response Prompting to Teach Home Maintenance Skills. An additional sixteen practices have earned a rating of Research-Based. These Practice Guides include Using Anchored Instruction to Teach Math, Using Corrective Reading to Teach Reading Skills, Using Graduated Sequence of Instruction to Teach Math, Using Graphic Organizers to Teach Science, Using Mnemonics to Teach Mathematical Problem Solving, Using Mnemonics to Teach Science Content, Using Peer Tutoring to Teach Reading, Using Peer Tutoring to Teach Social Studies Content, Using Peer-Tutoring to Teach Science, Using Schema-Based Instruction to Teach Math, Using Self-Management Instruction to Teach Math, Using Self-Monitoring to Teach Reading, Using *Whose Future is it Anyway?* to Increase Self-Determination Skills, Using the Self-Advocacy Strategy to Teach Student Involvement in the IEP, Using the Self Directed IEP to Teach Student Involvement in the IEP Meeting, and Using Simulations to Teach Social Skills. Finally, there have been ten practices identified by NTACTION as Promising. These include Using Computerized Concept Mapping to Teach Social Studies Content, Using Cover, Copy, Compare to Teach Math Skills, Using Graphic Organizers to Teach Math, Using Mnemonics to Teach Social Studies Vocabulary, Using Morphological Instruction to Teach Reading Skills, Using Peer-Assisted Instruction to Teach Math, Using Supplemental Materials to Teach Complex History Content, Using Computer-Assisted Instruction to Teach Student Participation in the IEP Process, Using an

Extension of Services after Graduation to Promote Increased Financial Skills, and Using Mnemonics to Teach Completing a Job Application.

Evaluation protocols. Effective practices have been evaluated regarding the amount, type, and quality of the research conducted, and are labeled as either (a) Evidence-Based, (b) Research-Based, (c) Promising, or (d) Unestablished. Criteria for each rating level are described below. EBPs are based on group experimental, single-case, and correlational research which: used rigorous research designs, demonstrated a strong record of success for improving outcomes, have undergone a systematic review process, and adhered to quality indicators related to specific research design (NTACT, 2016). RBPs are based on group experimental, single-case, and correlational research which: used rigorous research designs, demonstrated a sufficient record of success for improving outcomes, may or may not have undergone a systematic review process, and may or may not adhere to quality indicators related to specific research design. Promising Practices are based on group experimental, single-case, correlational, or qualitative research: demonstrate limited success for improving outcomes, may or may not have undergone a systematic review process, and may or may not adhere to quality indicators related to specific research design. Finally, Unestablished Practices are based on anecdotal evidence or professional judgment, and could include evidence from rigorous research studies which demonstrate negative effect. Currently NTACT is not identifying unestablished practices, but recognizes that there is a body of practices in the field for which there is not yet evidence of effectiveness. NTACT publishes criteria for each level of evidence based on group experimental, single-case, and correlational design studies available online at http://transitionta.org/sites/default/files/EP_Criteria_2016.pdf.

What Works Clearinghouse.

Purpose, affiliations, and funding. In 2002, the U.S. Department of Education's Institute of Education Sciences established the WWC as a resource to aid teachers in making informed decisions about educational practices, programs, and policies (WWC, n.d.). To accomplish this goal, the WWC is dedicated to providing "credible and reliable evidence" of the effectiveness of practices, programs, and policies. Their more than 700 publications are available free of charge and are easily searchable through their online database.

Available resources and evaluation protocols for each. The WWC has three types of resources: Practice Guides, Intervention Reports, and Single Study Reviews. These publications cover the following areas: adolescent literacy, beginning reading, character education, children classified as having an emotional disturbance, dropout prevention, early childhood education, early childhood education for children with disabilities, elementary school math, English language learners, high school math, middle school math, postsecondary education, science, and students with LD. A specialized review team conducts reviews for the WWC. This panel of experts includes a content expert, methodological expert, and review staff. Within these specialized review teams, a five-step process is followed to identify, select, appraise, and extract data from the available research. This process is described below:

1. Define the scope – Prior to any review, the panel develops a formal review protocol to define the parameters for the research to be included within the scope of the review, the literature search, and any area-specific applications of the evidence standards.
2. Search the literature – The panel gathers studies through a comprehensive search of published and unpublished publicly available research literature, including

- submissions from distributors/developers, researchers, and the public. They also use the parameters set by the protocol to search relevant electronic databases and websites.
3. Assess the research – This process is designed to ensure that the standards are applied correctly and that each study is represented accurately. The panel screens studies for eligibility, and then reviews every study meeting eligibility screens against WWC evidence standards. The result of this process is that each study receives a study rating of *Meets Evidence Standards without Reservations*, *Meets Evidence Standards with Reservations*, or *Does Not Meet Evidence Standards* (see Figure 1), that relates to the amount of confidence the panel places in the ability of the study to demonstrate causal evidence of the effectiveness of an intervention. The panel subsequently uses the findings from studies meeting standards in evaluating the effectiveness of an intervention.
 4. Combine the findings – The panel then combines findings from individual studies into summary measures of effectiveness, including those describing the magnitude of findings, the amount of supporting evidence, and the ability to generalize findings.
 5. Summarize the review – Finally, the panel presents the findings from their reviews in a variety of formats. Practice Guides contain practical recommendations for educators to address challenges in their classrooms and schools. Intervention Reports assess all studies of a specific intervention within a topic area. Single Study Reviews provide an in-depth examination of the research quality of one study. (WWC, n.d.)

The complete WWC Evidence Review Protocol for K-12 Students with Learning Disabilities is available online at <http://ies.ed.gov/ncee/wwc/documentsum.aspx?sid=31>.

Practice Guides present recommendations for teachers to address challenges in their classrooms and schools that are supported by three levels of evidence: Minimal, Moderate, or Strong. As of April, 2017, 19 practice guides have been published by the WWC, including two that address the needs of students with disabilities, including, but not limited to students with LD: *Assisting Students Struggling with Mathematics* and *Assisting Students Struggling with Reading*. Each of these Practice Guides offers specific recommendations to help teachers identify struggling students and implement evidence-based strategies to promote achievement. Each recommendation is supported by a level of evidence rating of Strong, Moderate, or Minimal (see table 4).

According to the WWC, Intervention Reports summarize findings on a given intervention using the highest-quality research in education as determined by the WWC standards. As of April, 2017, the WWC has published 17 Intervention Reports specific to students with LD (see Table 5). Reviewed interventions include: Alphabetic Phonics, Barton Reading & Spelling System, Dyslexia Training Program, Foundations, Herman Method, Lindamood Phoneme Sequencing, Peer-Assisted Learning Strategies, Project Read Phonology, Read180, Read Naturally, Reading Mastery, Reciprocal Teaching, Repeated Reading, Spelling Mastery, Unbranded Orton-Gillingham-based Interventions, Voyager Reading Programs, and Wilson Reading System. Intervention Reports provide a three-part recommendation. Part one issues an effectiveness rating at one of the following six levels:

- Positive: strong evidence that intervention had a positive effect on outcomes.
- Potentially Positive: evidence that intervention had a positive effect on outcomes with no overriding contrary evidence.
- Mixed: evidence that intervention's effect on outcomes is inconsistent.

- No Discernible: no evidence that intervention had an effect on outcomes.
- Potentially Negative: evidence that intervention had a negative effect on outcomes with no overriding contrary evidence.
- Negative: strong evidence that intervention had a negative effect on outcomes. (WWC, n.d.)

Part two of the recommendation is an improvement index that reports the difference between the intervention group mean and the comparison group mean, on the comparison group distribution. Improvement index values range from -50 to +50 with positive numbers denoting results favorable to the intervention group. Part three of the recommendation is an explanation of the extent of evidence. The criteria used to determine the extent of evidence for an intervention include:

- Medium to large
 - The domain includes more than one study.
 - The domain includes more than one setting.
 - The domain findings are based on a total sample of at least 350 students, or assuming 25 students in a class, a total of at least 14 classrooms across studies.
- Small
 - The domain includes only one study.
 - The domain includes only one setting.
 - The domain findings are based on a total sample size of fewer than 350 students, and, assuming 25 students in a class, a total of fewer than 14 classrooms across studies.

Single Study Reviews provide a review of an individual study that includes the WWC's assessment of the quality of the research design and technical details about the study's design and findings. As of April, 2017, the WWC has reviewed 2,168 individual studies using their protocols for Children and Youth with Disabilities. The addition of the search term "Learning Disability" returned 22 studies, however, all studies were ineligible for review or did not meet WWC guidelines. For the purpose of this study, I will consider no Single Study Reviews as relevant to students with LD, as a search of the site does not reveal any such studies without conducting a hand search of each. This level of detail is beyond the scope of this study.

Summary of Online Resource Centers.

As evidenced in the descriptions above, these five ORCs contain a vast amount of information for teachers pertaining to EBPs and other RBPs that have been evaluated for use with students with LD, as well as for other populations of students with and without disabilities. Although each ORC uses their own criteria for evaluating research evidence, they all maintain a high standard of quality when rating different educational practices. However, these varying inclusion/exclusion criteria used by each center can lead a single practice or program to earn varied ratings across sites. While all syntheses published via ORCs are intended to communicate reliable research evidence to educators who are tasked with making real-life decisions about practices for their students, not all ORCs place the same value on each of the various quality indicators (Slavin, 2008). Some, such as the BEE and WWC, place great value on external validity and practical validity, without giving much attention to the study's contribution to theory or practice.

Trustworthiness of ORCs. In consideration of these and other similar issues related to ORCs, the research team of Test, Kemp-Inman, Diegelmann, Hitt, and Bethune (2015)

conducted an evaluation of several ORCs to determine whether the EBP resources available online are trustworthy. To begin, they conducted a comprehensive search for websites claiming to provide EBPs. Their initial search resulted in 60 websites which claimed to provide EBPs or RBPs for students with and without disabilities. Thirteen websites did not meet inclusion criteria, resulting in 47 websites which were included in the review. Each site was evaluated and issued one of three ratings of trustworthiness: “Trust”, “Trust with Caution”, or “Do Not Trust”. To earn a rating of “Trust”, a website had to explicitly demonstrate quality of evidence. To do so, a website had to state or provide a direct link to a specific set of criteria for quality of evidence. To receive the rating of “Trust with Caution”, the site’s quality of evidence had to be implicitly demonstrated. To earn this rating, the website could refer to criteria for determining evidence quality without directly presenting such criteria. Finally, a site could earn a rating of “Do Not Trust”. To earn this rating, there had to be no indication of criteria to determine quality of evidence.

Through their review process, Test et al. (2015) identified 16 ORCs that earned a rating of “Trust”. Among those were the BEE, NCII, National Secondary Technical Assistance Center (now reauthorized as NTACTION), and the WWC, which will be included in this dissertation study. Additional ORCs earning a rating of “Trust” included The American Speech-Language-Hearing Association, Center for School Counseling Outcome Research, National Autism Center, National Registry of Evidence-Based Programs and Practices, Promising Practices Network, Coalition for Evidence-Based Policy, IRIS Center, National Professional Development Center on Autism Spectrum Disorders, Child Trends, Campbell Collaboration, and National Center for the Dissemination of Disability Research. Many of these sites were excluded from this proposed dissertation study due to the fact that they do not publish resources for students with LD. The

Alerts Series earned a rating of “Do Not Trust”. However, this resource will still be included in this dissertation study due to its direct connection to students with LD, explicit issuance of an evidence rating, and well established reputation in the field of special education as a valuable resource.

When making decisions about particular practices, it is critical for teachers to weigh all information across the various ORCs to determine the reliability and trustworthiness of the available evidence. As previously stated, although the ORCs present a great advance in providing information and resources pertaining to EBPs to educators, there are several aspects of their current status which pose potential challenges to their widespread use in determining practice. However, there is a theoretical framework that teachers can independently apply when searching for high-quality, pre-appraised research evidence. The next section will describe this framework, the 6S Model, in greater detail.

Section 4: The 6S Model

Teachers can easily become overwhelmed by all the information available from ORCs and other sources. The body of research evidence that contributes to these centers is immense and constantly growing. Each year, nearly 20,000 new scholarly articles are published in education adding to the already vast amount of available information (Miech, 2005). Aside from simply lacking the time to sort through all of this information, many teachers lack the training necessary to accurately analyze and interpret scholarly research (Odom et al., 2005). So how can teachers begin to make sense of all the resources available to them? One method that teachers can use to help identify high-quality, pre-appraised, evidence is the 6S Model (see Figure 2; DiCenso et al., 2009). The 6S Model originated in the field of medicine where it was developed to help doctors and other medical professionals make informed decisions based upon research

evidence. The 6S Model has since been adapted and applied to education as well. In the discussion of the 6S Model that follows, I will present examples from medicine and education side by side, with a more detailed discussion of the resources available in the field of education to follow.

6S Levels of Evidence.

As applied in education today, the 6S Model includes six levels of evidence: systems, summaries, synopses of syntheses, syntheses, synopses of single studies, and single studies (DiCenso et al., 2009). These levels of evidence can be arranged visually into a pyramid with systems at the top, representing the peak level of evidence, and single studies at the bottom, representing the base of the evidence pyramid. Systems reside at the top of the 6S pyramid, because systems represent the highest level of pre-appraised evidence. In the field of medicine, systems are computerized decision support models that incorporate an individual patient's characteristics and needs to generate personalized health solutions. Such systems integrate research evidence and provide concise summaries of findings linked to a patient's personal electronic health records. The greatest strength at the systems level is the ability to customize interventions to meet individual needs, however, in order to be effective, systems must undergo frequent updating (Windish, 2013; see Table 7). Unfortunately, such systems do not yet exist in education, so educators seeking high-quality, pre-appraised evidence should start their search at level two of the pyramid, with summaries (Santangelo et al., 2015).

The second level of the pyramid is the summaries level. In medicine, summaries are regularly updated, clinical resources that integrate evidence-based information related to specific clinical problems (DiCenso et al., 2009). Summaries in education provide teachers with highly reliable recommendations through succinct, integrated research on a single topic such as

adolescent literacy or fractions instruction. Summaries are typically written by groups of experts who seek to integrate all research evidence available on a given topic, including original research studies, syntheses, and meta-analyses (Santangelo et al., 2015). Because a summary includes all relevant research on the topic, it is able to provide highly reliable recommendations. Frequently, summaries will include an evaluation of the strength of the existing evidence base along with the expert recommendation (Windish, 2013). Summaries can help teachers to identify specific practices and programs to meet individual student needs. When using summaries to determine practice, it is important that the summary has been recently updated, as new evidence becomes available which has the potential to change the recommendations available in a summary. Additionally, the guidelines used across organizations to develop summaries vary significantly, so findings across summaries may be inconsistent. In education, the only summaries currently available for students with LD are the WWC Practice Guides. A complete listing of available resources at each level of the 6S pyramid can be found in Table 6.

Moving down the pyramid, the third level of evidence is synopses of syntheses. A research synthesis is a comprehensive review of all research evidence related to a specific issue or question (DiCenso et al., 2009). Synthesis of research is a complex multi-step process in which researchers extract relevant findings across the body of literature. Because this process is so time consuming and in depth, the resulting publications are frequently lengthy and highly technical in nature. Most practitioners lack the time, and often the training, to interpret such research efficiently and effectively. The synopsis of synthesis provides a succinct summary of findings presented in a synthesis with sufficient detail to support action by the practitioner. Often synopses of syntheses also evaluate the methodological rigor of the included studies (Windish, 2013). One drawback at this level of the pyramid is that a synopsis of synthesis

cannot be conducted until after a synthesis has been published, and therefore, may not represent the most current research available for a given problem. As of April, 2017, none of the ORCs discussed in this chapter publish synopses of syntheses for students with LD.

At the fourth level of the pyramid is the synthesis itself (DiCenso et al., 2009). As described above, a synthesis is a comprehensive review of research evidence. Findings can be presented quantitatively, as a meta-analysis, or in a more qualitative review. Syntheses integrate the existing research on a particular problem or area of instruction (Santangelo et al., 2015). They establish any consistencies across studies and address any inconsistencies that arise in the data. Additionally, meta-analytic techniques can reduce bias and error (Windish, 2013). Syntheses are highly technical in their conduct and have the potential to exaggerate findings if poor methodology is utilized. When a synopsis of synthesis does not exist, or a practitioner requires more detailed information than is presented in a synopsis, the original synthesis would present the next best level of evidence. Program Reviews from the BEE, Current Practice Alerts in the Alerts series, Practice Descriptions from NTACTION, and Intervention Reports from the WWC are the examples of syntheses for students with LD available through the ORCs which are the focus of this study.

At the fifth level of the pyramid are synopses of single studies. Just as a synopsis of synthesis provides a brief overview of the results of a synthesis, the synopsis of single study provides a brief, succinctly detailed summary of findings for a single research study (DiCenso et al., 2009). Advantages of a synopsis over the original study itself include: the assurance that the study is of sufficiently high-quality and relevance to warrant the completion of a synopsis, the brief and accessible format of the synopsis, and the added value of the expert commentary. Not all studies will have a synopsis available, and often synopses are available only for a small

percentage of high-quality studies with significant findings. In the field of education, examples of synopses of single studies include Study Synopses published in the Tools Charts by the NCII and Single Study Reviews by the WWC.

At the base of the pyramid is level six, the single study. Single studies are readily available in print and online (DiCenso et al., 2009; Santangelo et al., 2015). They are the most current source of evidence, but due to the vast number of studies published in education, it can be time consuming to search for studies that are applicable to a particular problem. Also, in order to identify appropriate studies, practitioners must understand how to locate studies of interest (Windish, 2015).

The Evolution of the 6S Model. When this model was first introduced to the medical field in 2002, it had only four levels of evidence which included: systems, synopses, syntheses, and studies (Booth, 2002). The purpose of the 4S Model, as it was then known, was to help practitioners in the medical field locate the highest level of pre-appraised research evidence available for an identified problem. In developing the 4S Model, Booth indicated that the search for evidence must take into account the reliability and timeliness of the research. He recognized the need create a model which guided practitioners towards the highest level of evidence available for a given problem. When faced with a clinical concern, a medical practitioner would be advised to begin their search for treatment at the systems level. If a search of available systems resulted in no appropriate treatment, the practitioner would step down the pyramid, one level at a time, through synopses, syntheses, and studies until an appropriate treatment could be identified.

In 2006, Haynes added summaries to the 4S Model, thus bringing rise to the 5S Model. The additional level was inserted between synopses and systems and integrated the best available

evidence from each of the lower levels in order to provide the full range of evidence on a given problem (Haynes, 2006). Haynes indicated that the 4S Model was useful in helping guide practitioners to high-quality evidence to inform decision-making, but he criticized its oversimplification of how individual studies relate to the development of specific treatments and therapeutic interventions. He believed that the lower levels of the pyramid (e.g. studies, syntheses, and synopses) focused on only one aspect of a problem, and therefore, left the practitioner to integrate evidence on their own. For example, a summary would provide a description of all possible treatment options for a given health concern, whereas a study, synthesis, or synopsis would focus only on an individual drug or therapeutic regimen. Because a summary combines the evidence from all current synopses, syntheses, and studies, it removes the need for a practitioner to interpret evidence on his or her own to identify the best approach to a given problem. In 2009, the 5S Model evolved again and became the 6S Model when DiCenso et al. separated the synopses level to include synopses of single studies and synopses of syntheses as two separate levels of the pyramid, as these two types of evidence are both common in medicine.

Application of the 6S Model in Education. Although the 6S Model was developed in the field of medicine, over the years, it has been applied in other fields, including education. Just as in its original medical application, evidence at the top of the pyramid offers teachers the most comprehensive source of pre-appraised research to address classroom needs. Evidence at lower levels of the pyramid may be more plentiful, but it has not yet undergone the systematic evaluation necessary to move up through the levels of the model. At the single studies level of the pyramid, teachers will find many published articles on a topic of interest. However, single studies offer very little value to teachers who wish to identify EBPs since no one study is enough

to prove the efficacy of a practice (Santangelo et al., 2015). However, if no higher level of evidence exists on a particular topic of interest, a teacher should use the best available level of evidence, including single studies. Each level of evidence in the 6S Model has its own unique strengths and weakness, and the ability to contribute to the educational decision making process for teachers working with students with LD (Windish, 2013).

Summary of the 6S Model. In recent years, both educational reforms and educational laws have pushed for the inclusion of research evidence when making instructional decisions (Santangelo et al., 2015). In order to provide students with LD the best instruction, it is important to seek the highest level of evidence to support instructional decisions. The 6S Model provides teachers with a decision-making framework that can guide this process. However, even with the availability of ORCs and decision making frameworks like the 6S Model, a growing body of literature suggests that teachers are not likely to make effective use of research if they do not believe in its ability to improve student performance (Cook, Tankersley, & Harjusola-Webb, 2008). Therefore, it is also important to examine teachers' opinions of research and their reported use of research in instructional decision-making. A detailed description of the research related to these ideas is presented in the following section.

Section 5: Teachers' Reported Use and Opinions of EBPs and Research in Special Education

Historically, teachers have used their own expertise, experience, and intuition to determine how to teach their students with LD. However, with the passage of laws such as ESSA and its predecessors, teachers are now legally required to incorporate EBPs and RBPs when making instructional decisions (Cook & Cook, 2011). In a 2002 lecture, Slavin proposed:

At the dawn of the 21st century, education is finally being dragged, kicking and screaming, into the 20th century. The scientific revolution that utterly transformed medicine, agriculture, transportation, technology, and other fields early in the 20th century almost completely bypassed the field of education. If Rip Van Winkle had been a physician, a farmer, or an engineer, he would be unemployable if he awoke today. If he had been a good elementary school teacher in the 19th century, he would probably be a good elementary school teacher today. (p. 16)

Research evidence in education deserves the rigorous application to practice it receives in other fields so that effective practices and programs can be identified and applied in the classroom (Slavin, 2002). At present, the application of research findings in education remains inconsistent. Evidence tends to gain respect only if it happens to correspond to the current educational and political fashions. Regardless of trends and politics, effective instruction is a critical component in the success of students, and especially for those with LD. All other factors being equal, students who receive effective instruction tend to perform at higher levels than students who do not have access to high-quality instruction (Cook et al., 2012). That is: given identical students, one who receives intensive, systematic instruction on foundational reading skills in small group settings, a recommendation found to have a strong level of evidence by the WWC, and another student who does not receive this level of instruction, the first student is likely to outperform the second. However, as will be explained next, many of the practices which have been identified as effective through the analysis of high-quality research are infrequently used in the classroom as teachers continue to favor practices which have been shown to have little to no impact on improving student outcomes (Burns & Ysseldyke, 2009; Cook & Cook, 2011; Cook et al., 2012). Despite the depth of resources available to teachers,

many researchers have asserted that EBPs are not frequently adapted in the classroom. The following sections will elaborate upon teachers' knowledge, use, and opinions of educational research in order to explain why such practices prevail.

Teachers' reported knowledge and use of EBPs and research in education. There is limited research available on teachers' knowledge and use of EBPs and RBPs, and what is reported about implementation varies greatly. In my search for relevant literature, I was able to locate very few research studies related to this topic. Therefore, the research evidence evaluated below includes groups of teachers who may not work specifically with students with LD. The decision to include additional populations was made due to the lack of specific research dealing exclusively with teachers of students with LD. With the inclusion of these groups, I was able to locate five studies that report on teachers' knowledge and use of EBPs and RBPs. For each study, I will present the research questions and purpose, participants, instruments, important findings, limitations, and implications. The studies are presented alphabetically by first author and are summarized in Table 8.

Burns and Yssledyke, 2009. Research questions and purpose. In 2009, Burns and Yssledyke studied the reported prevalence of EBPs in special education by surveying a random selection of special education teachers and school psychologists. This exploratory study was guided by two research questions: (1) "How frequently are EBPs reportedly engaged in the education of pupils with disabilities? [and (2)] Are practices with large effects reportedly used more frequently than those shown to be ineffective when educating pupils with disabilities?" (Burns & Yssledyke, 2009, p. 4). The study utilized survey methodology to assess the frequency of use of practices which had been predetermined as either effective (Applied Behavior Analysis, Direct Instruction, and Mnemonic Strategies), moderately effective (Formative Evaluation), or

ineffective (Modality Training, Perceptual-Motor Training, Psycholinguistic Training, and Social Skills Training) through meta-analytic research.

Participants. Surveys were sent to 500 special education teachers and 1,000 school psychologists who were randomly selected from the CEC and National Association of School Psychologists membership rosters (Burns & Ysseldyke, 2009). School psychologists were included in the sample because they typically work closely with special education teachers and could provide observational data on classroom practices to corroborate the self-report data provided by the special education teachers. A total of 174 special education teachers and 333 school psychologists returned surveys for a response rate of 33.8%. The majority of teacher respondents reported working in a resource room (37.6%) or self-contained classroom (37.6%)

Instruments. Two 12-item questionnaires (one designed for special education teachers and one designed for school psychologists) were distributed asking respondents to rate the frequency of use for various practices in special education (Burns & Ysseldyke, 2009). Practices included in the survey were pre-identified as effective, moderately effective, or ineffective based on meta-analytic research. Using a 5-point Likert scale, teachers rated the frequency with which each practice was used in the classroom from 5-almost every day to 1-almost never. School psychologists were asked to rank order eight practices from most frequently observed to least frequently observed based on classroom observations.

Important findings. Nearly 90% of respondents indicated using or observing the use of Direct Instruction at least once per week (Burns & Ysseldyke, 2009). However, approximately 75% of respondents also reported the use of Modality Training and Social Skills Training at least once per week as well. The results of this study indicated that while teachers utilized some

practices backed by sound research, such as direct instruction, they also used practices which research indicates have little effect on student performance.

Limitations. While this study did evaluate overall reported use of the eight practices identified by researchers, it was not designed to answer the question of why certain practices are utilized while others are not (Burns & Ysseldyke, 2009). Therefore, it remains unclear how teachers go about selecting practices for classroom use. While the results across groups were generally consistent, there were some differences in the data. Comparisons across the two groups of respondents are not possible due to the different survey formats. Because participants were members of well-respected professional organization that distribute research journals to their members, they could represent a more well-informed group than the target population. While the response rate for this study was low, it was consistent with previous survey research for the target populations. It is unclear whether significant differences exist between respondents and non-respondents which could skew the research findings.

Implications. In future research, the self-report findings of this study should be confirmed through thorough observation (Burns & Ysseldyke, 2009). Additionally, the inclusion of additional practices identified as effective should be considered for future research.

Easterbrooks, Stephenson, and Gale, 2009. *Research questions and purpose.* Easterbrooks, Stephenson, and Gale (2009), studied veteran teachers' use of recommended practices in deaf education to determine if teachers were implementing recommended practices from their teacher preparation programs, or following their current school's culture to determine classroom practice. The researchers also examined whether a review of practices could improve veteran teachers' level of use of target practices. Though this study does not focus on EBPs

specifically, the findings can be used to help understand teachers' use of EBPs in deaf education as the recommended practices in the study were backed by research.

Participants. Twenty-three teachers of students who are deaf or hard of hearing participated in this study (Easterbrooks et al., 2009). The teachers were from three different schools for the deaf across three states. Participants were recruited through the school superintendents or directors who were solicited to recommend teachers for the study. The sample consisted of 12 elementary school and 11 high school teachers.

Instruments. Data were collected using the Levels of Use of the Innovation tool developed by Loucks, Newlove, and Hall (1998), a questionnaire that identifies concerns which arise while implementing an innovation (Easterbrooks et al., 2009). The Levels of Use tool describes the behaviors of participants as they become more confident in using an innovation. For a given innovation or practice, the participant rates his or her level of concern using one of eight ratings (non-use, orientation, preparation, mechanical, routine, refinement, integration, or renewal) which represent different degrees of sophistication the teacher is able to bring to the practice. The participants also provide ratings across seven different categories of use (knowledge, acquiring information, sharing, assessing, planning, status reporting, and performing) which represent the different ways an individual can think about each of his or her concerns. In addition to the Levels of Use tool, the authors also collected data through lesson plan examination. Plans were rated on a scale of one to five for each of five criteria tied to the target practices of independent reading and problem solving.

Important findings. Results indicated that all but one teacher in this study was using the target practices to some degree (Easterbrooks et al., 2009). However, teachers in the study also indicated that they could benefit from "refresher courses" on EBPs, which the authors

hypothesized might stem from a lack of confidence in their own ability to implement EBPs for their students. Additionally, through a review of the practices, veteran teachers did show improvement in their level of use by six tenths of a category.

Limitations. As with many studies in the field of deaf education, the small sample size represents a limitation for this study (Easterbrooks et al., 2009). The researchers had hoped to obtain a larger sample to participate, but did not record what percentage of the available pool was represented in their final sample of teachers. The small sample size did not allow for random assignment of practices as was originally intended. Additionally, the fidelity with which the participants carried out the intervention was not reported. No observational data were collected to check the accuracy of the self-report data collected on the Levels of Use tool.

Implications. Future research should include more intensive interventions that are implemented by researchers or other trained professionals, and should include observation or other confirming evidence along with self-report data (Easterbrooks et al., 2009). The authors indicated that there is also a need for more research into what EBPs are being used by veteran teachers of deaf education in order to help improve professional development designed to facilitate the implementation of EBPs.

Gable, Tonelson, Sheth, Wilson, and Park, 2012. *Research questions and purpose.* In 2012, Gable et al. compared general and special education teachers' knowledge and skills related to implementing EBPs for students with emotional disabilities. They conducted a survey to identify teacher perspectives regarding the (a) importance, (b) amount of use, and (c) level of preparation regarding 20 EBPs identified through comprehensive review of the literature.

Participants. Questionnaires were sent to 9,654 teachers licensed to teach students with emotional disabilities. An additional 1,979 school principals were asked to distribute the

questionnaire to five general education teachers who taught students with emotional disabilities (Gable et al., 2012). A response rate of approximately 15% resulted in 1,558 general education teachers and 1,472 special education teachers completing the questionnaire.

Instrument. The researchers developed a two-part questionnaire to determine participants' perceptions regarding current EBPs for students with emotional disabilities (Gable et al., 2012). The first part of the questionnaire contained demographic questions about the participants and their schools. Part two of the questionnaire contained questions about EBPs drawn from the current literature. Using a Likert scale, teachers rated the perceived level of importance, usage, and preparation to implement each of 20 different practices.

Important findings. Fifteen of the 20 practices were identified by special educators as being important or very important, while only 11 practices earned the same rating among general education teachers (Gable et al., 2012). Only five practices were identified as important or very important by at least 80% of teachers in the study. The results of this study suggest that teachers of students with emotional disabilities do not commonly use EBPs for this population. Practices found to be least used included Group-Oriented Contingency Management, Anger Management Programs, and Peer-Mediated Intervention to promote positive behavior. However, the majority of participants reportedly used Specialized Instruction, Academic Supports and Modifications, Behavior Support and Management Plans, and Clear Rules and Expectations. Despite the reported use of many of the EBPs included in the study, both general and special educators indicated that they felt unprepared to implement these interventions with fidelity. While many teachers believed they had inadequate preparation to implement the EBPs in the study, there was a direct correlation between teachers' perceived level of preparation and their use of EBPs.

Limitations. The self-report nature of the data in this study means that the accuracy of responses could not be substantiated (Gable et al., 2012). Additionally, biased participant responses and potential misunderstanding of practices could have influenced the findings. In selecting 20 practices for inclusion in the study, additional practices may have been excluded with which participants may have been more familiar. As the study was situated within a limited geographic area, the responses of the participants may not be representative of teachers across the country. The study does suggest, however, that few teachers working with students with emotional disabilities utilize practices grounded in scientific research.

Implications. The results of this study suggest that students with emotional disabilities may not be receiving a quality of education that is most likely to produce positive outcomes (Gable et al., 2012). This highlights the need to better prepare teachers of students with emotional disabilities to meet the unique needs of this group of students. Additional research should address the teacher preparation process concerning students with emotional disabilities.

Gagnon and Maccini, 2007. Research questions and purpose. Another study that explored the use of practices supported by research was conducted by Gagnon and Maccini (2007) on special and general education teachers' reported use of empirically validated and standards-based instructional approaches in secondary mathematics. This study focused on teachers who worked with students with emotional and behavioral disorders (EBD) as well as LD. As with the previously described study, this study did not focus on EBPs, but did apply rigorous standards to identify practices in a way that is similar to that which is used to identify EBPs.

Participants. The target population for this study consisted of teachers from all public high schools in the United States representing two groups: (a) secondary general education math

teachers who teach students with LD and EBD in their math classes, and (b) special education teachers who teach math to students with LD and EBD or collaborate with general education math teachers (Gagnon & Maccini, 2007). The sample was obtained from a comprehensive database of schools and school personnel in the United States. An initial sample of 325 general education math teachers working with students in special education and 425 special education teachers were solicited for participation in the study. A final sample of 224 general education math teachers and 253 special education teachers met the inclusion requirements and were solicited for participation. A total of 91 (35.97%) special educators and 76 (33.92%) general educators responded to the survey.

Instruments. Separate questionnaires were developed for general and special educators participating in this study (Gagnon & Maccini, 2007). The questions on each version of the instrument were identical with the exception of three questions that concerned student and teacher information. The questionnaire included closed-ended and ordinal questions on five topics: (a) teacher and student information, (b) teacher confidence, (c) teacher preparation and use of instructional strategies consistent with National Council of Teachers of Mathematics, self-monitoring, direct instruction, graduated instruction, and student groupings, and (d) the frequency with which students engaged in math tasks consistent with the National Council of Teachers of Mathematics standards. In section (c) from the above list, participants reported their use of the five instructional techniques using a Likert scale from 0-never to 4-daily use.

Important findings. Results indicated that nearly 70% of both general and special education math teachers felt prepared to use strategies consistent with Direct Instruction, a known EBP, and used such strategies frequently in their teaching (Gagnon & Maccini, 2007). A greater number of general education teachers reported feeling prepared to use Graduated

Instruction, whereas a greater number of special education teachers reported feeling prepared to use Self-Monitoring Strategies in their instruction. Special education teachers reported more preparation related the use of Grouping Practices, including Cooperative Learning Activities, Peer Tutoring, and Small-Group Assistance.

Limitations. The small sample size and low response rate limit the generalizability of the findings from this study (Gagnon & Maccini, 2007). The researchers were unable to collect data on nonrespondents, so it is unclear whether differences between respondents and nonrespondents could account for survey outcomes.

Implications. These results elaborate upon to the discrepancies that exist between general and special education teachers' use of specific practices for students with disabilities (Gagnon & Maccini, 2007). Findings from the current study suggest that veteran teachers and those with fewer courses beyond their initial teaching degree were more likely to use traditional approaches to teaching math. Future research should examine the knowledge and beliefs held by teachers in these groups about EBPs to determine why their practices differ from other groups of teachers. Findings from this study also suggest that teacher training programs and professional development opportunities for training educators in the use of EBPs and other empirically validated instructional practice could be a critical means of improving practice and student performance.

Stormont, Reinke, and Herman, 2011. Research questions and purpose. Stormont et al. (2011) studied teachers' knowledge of 10 evidence-based interventions for students with EBD. The purposes of the study were to explore general education teachers' knowledge of EBPs and their schools' resources to meet the needs of students with intellectual, emotional, and behavioral needs.

Participants. Participants included 239 early childhood and elementary school general education teachers (Stormont et al., 2011). Participants were pulled from five school districts that represented urban, suburban, and rural demographic areas.

Instrument. Data were collected through a 42 item, researcher developed questionnaire focused on participants' attitudes, knowledge, and beliefs regarding the school's role in supporting students with mental health needs and the participants' attitudes, perceptions, and knowledge towards EBPs in schools (Stormont et al., 2011). For part one of the questionnaire, participants were asked to rate 10 practices identified by the authors as EBPs using a 5-point Likert scale, with higher value responses indicating that the participant viewed the practice as an EBP. On the second part of the questionnaire, participants were given 12 items on data collected and resources available to support students' mental health at school and were asked to respond yes, no, or not sure as to whether their school collected data on or provided the listed resource.

Important findings. The only EBP that was recognized by the majority of teachers (78%) was Positive Behavioral Interventions and Supports (Stormont et al., 2011). For the remaining nine EBPs, only 10% of teachers or fewer accurately identified them as evidence-based, with the vast majority of teachers indicating that they had not ever heard of the practices.

Limitations. The teachers included in this study may not be representative of the population of teachers, as only preschool and elementary general education teachers were included, and only 50% of potential participants completed the questionnaire (Stormont et al., 2011). Of the school districts that agreed to participate in the study, one district had teachers or schools that did not participate. Schools who did not participate had higher percentages of students on free and reduced lunch and twice as many students from African American backgrounds.

Implications. The authors believe this study demonstrates the importance of improving teachers' ability to meet the needs of students with EBD through the increased use of EBPs (Stormont et al., 2011). Future research should explore how teachers make decisions about which practices are evidence-based and how they go about finding these resources. Additionally, there needs to be research into the marketing and use of ORCs to determine if they are of any real benefit to teachers.

Summary of studies on teachers' reported knowledge and use of EBPs and research in education. Together, the above studies outline what is currently known about teachers' reported use of EBPs and RBPs in the classroom. While teachers seem to recognize the importance of EBPs for improving student performance as noted in Gable et al.'s (2012) study, the actual level of use being reported is very low. Across studies, only Direct Instruction was reported as being used by a majority of teachers (Burns & Ysseldyke, 2009). It is clear that teachers feel underprepared and uninformed when it comes to the use of EBPs (Gable et al., 2012; Stormont, Reinke, & Herman, 2011). These feelings of a lack of preparation and information may contribute to teachers' overall opinions of research. The findings from literature related to this topic will be reviewed next.

Teachers' Opinions of Research in Education. When compared to professionals in other fields, teachers seem to view the applicability of research to practice with a high level of cynicism (Cook et al., 2012). In general, teachers mistrust research, and therefore rely on more personal sources such as individual beliefs, past practice, and collegial recommendations to determine how and what to teach (Cook & Cook, 2011). This is especially the case for special education teachers who are used to doing "what works" for each individual student rather than using required curricula (Boardman, Arguelles, Vaughn, Hughes & Klingner, 2005). Even

novice teachers who have received their education since the passage of laws mandating the use of research have varying views on the legitimacy of this research in determining practice (Jones, 2009). As demonstrated in Gable et al.'s (2012) study above, the majority of teachers recognize the importance of using high-quality instructional strategies and behavioral interventions, however this does not seem lead to increased adaptation of EBPs in classroom practice (Burns & Ysseldyke, 2008). One potential explanation for this low level of implementation is that teachers do not trust the research behind the high-quality instructional strategies. Below, I will elaborate upon two studies that examined special education teachers' reported opinions of research. They are presented alphabetically.

Boardman, Argüelles, Vaughn, Hughes and Klingner, 2005. In a 2005 study, Boardman et al. examined special education teachers' perspectives about research in education and the extent to which they found research findings to be useful in their practice. The study also explored how new practices were introduced to the target groups of teachers by their schools and their reactions to these practices related to their appropriateness for students with special needs.

Participants. Participants in the study included 49 elementary special education teachers who worked with students with LD and EBD (Boardman et al., 2005). Teachers were selected from four school districts in Texas and Florida. One urban and one suburban district from each state were selected for participation. All districts in the study offered a range of service delivery models for students with LD and EBD. Additionally, the demographics of the school districts closely matched those of the states in which they were located. Individual participants had to meet five criteria for selection: (a) they were certified to teach special education, (b) they primarily taught students with LD or EBD, (c) they had a minimum of four years of teaching

experience, (d) they were responsible for delivering instruction in reading to the students, and (e) they worked in schools with more than 30 students with LD.

Data collection. Data were collected through focus group interviews using a structured interview guide (Boardman et al., 2005). Prior to facilitating the focus group interviews, five researchers were trained in procedures for running effective focus groups. The facilitators used an interview guide to maintain consistency across groups, but were permitted to adapt or change questions as necessary to guide the direction of their groups' discussion. Prior to the start of the study, interview questions were tested through two pilot focus groups. For data collection, eight focus groups of teachers who primarily taught students with LD and four focus groups of teachers who primarily taught students with EBD took place. Each focus group was two hours in length.

Significant findings. Results indicated a general skepticism among special educators regarding the validity of research (Boardman et al., 2005). The participants reported a belief that it was part of the expertise of being a special education teacher to know how to access and adapt practices and programs to meet the individual needs of students. Many of these teachers felt that novice special educators would be more likely to embrace using research to guide their practice. Teachers in this study reported a number of reasons for their skepticism towards research, including: (a) the feeling that the majority of research is conducted using general education students, and therefore, does not apply to special education populations, (b) a belief that educational research lacks validity and can be manipulated to show whatever outcomes the researchers desire, and (c) a perceived lack of necessity to incorporate EBPs in order to improve instruction.

Limitations. One potential limitation of this study is that the focus group facilitators were also the study authors, and two of the authors independently analyzed the data (Boardman et al., 2005). While focus group interviews have been found to provide respondents the opportunity to generate ideas on a given topic, the content of the structured questions and social nature of the focus group could have influenced responses or omitted areas for which respondents would have provided meaningful responses. Repeated study through observation or individual interview could potentially elicit different responses from participants. It is unclear whether the participants who agreed to participate in the focus groups differed in any meaningful way from those who did not elect to participate. The authors did not provide data on nonrespondents.

Jones, 2009. In her 2009 study, Jones explored 10 novice special educators' views of EBPs. Specifically, Jones' study aimed to determine the teachers' opinions of research in general as well as their use of six instructional practices for students with high-incidence disabilities, such as LD, that are supported by research.

Participants. Each of the 10 participants in the study had less than three years teaching experience and worked with students with high-incidence disabilities in grades K-12 in one state in the Mid-western region of the United States (Jones, 2009). All special education teachers in a seven-county area who met the above requirements were contacted to elicit their participation. Snowball sampling was also used to broaden the participant pool. From a list of 28 potential participants who agreed to participate in the study, 10 were purposively selected to represent various types of programs at differing levels.

Data collection. Data collection took place through a structured interview protocol, classroom observation, and the completion of a post-observation rating scale by each participant (Jones, 2009). The structured interview protocol was designed to elicit information on teaching

styles, methods, and practices, as well as the instructional decision making process used by each of the novice special education teachers. Each participant was also observed during instruction a minimum of three times, with each observation lasting between 40 and 60 minutes. Following all observations, each participant completed a rating scale that addressed various aspects of the six instructional practices that were the focus of the study.

Significant findings. Jones found that only four of the 10 participants could be identified as definitive supporters of research. Three of the 10 participants were classified as cautious consumers, and the remaining three participants were found to be critics of research (Jones, 2009). Even those teachers who claimed to be strong supporters of using research to determine practice failed to bring these beliefs into their teaching by using EBPs in the classroom during observation periods. Many of the participants believed that simply becoming a teacher provided them with the knowledge and expertise to make smart instructional decisions despite their own reported lack of knowledge in interpreting research.

Limitations. The generalizability of these findings is limited by the small sample size, self-report nature of the data, and the lack of diversity in the sample (Jones, 2009). All participants were women who were selected from a restricted geographical region and volunteered to participate in the current study. It is possible that the group of participants hold different views towards educational research than those who did not agree to take part in this study. Despite these limitations, it is my belief that this study did uncover a need to improve teacher preparation programs to include a better foundation in research to facilitate the use of research in instructional decision-making.

Summary of studies on teachers' opinions of research in education. Together, Boardman et al.'s (2005) and Jones' (2009) studies highlight what seem to be relatively wide-

spread negative feelings that special education teachers hold regarding research. These findings may offer insight about why teachers fail to use research to guide their instructional decisions for working with students with LD. While a substantial amount of educational research is being produced related to EBPs, there is growing evidence indicating teachers are not using this research to select and use the best instructional strategies available for students with LD. This mismatch is commonly termed the “research-to-practice gap”. The literature relating to this topic is reviewed in the next section.

Section 6: The Research-to-Practice Gap

There exists a significant gap between what has been found to be effective practice in education and what practices are actually being implemented in the classroom (Jones, 2009). This discrepancy is known as the research-to-practice gap, and may play a primary role in the persistence of disappointing student outcomes despite extensive research into effective teaching strategies (Cook et al., 2012). Despite the vast amount of research published in the field of education each year, teaching practices often fail to rely upon this extensive research base, and instead are grounded in personal experience and ideology (Cooper, 2009). Through an extensive review of the literature, Broekkamp and Van Hout-Wolters (2007) identified four issues that contribute to the research-to-practice gap in education: 1) educational research yields few conclusive results; 2) educational research yields few practical results; 3) teachers believe that educational research is not meaningful for teachers; and 4) teachers lack the skills necessary to make use of educational research. In the following sections, I will discuss these issues, among others, in two categories: factors related to the production of research, and factors related to teachers’ use of research and its perceived value.

Factors related to the production of research. Based on the existing literature, several factors related to the production of research appear to be contributing to the persistence of the research-to-practice gap. First, rather than being guided by the teachers engaged in the classroom on a daily basis, it is the researchers themselves who determine the research agenda in education (McIntyre, 2005). In other fields, such as medicine, it is the practitioners who demand evidence-based research. Teachers, however, fail to recognize that the lack of evidence-based research is even a problem. In fact, Jones (2009) reported a belief held by novice special education teachers that simply being or becoming a teacher made one an expert in making instructional decisions. In the absence of guidance from teachers, researchers will continue to advance their own personal research agendas that may or may not align with the instructional needs of teachers in the classroom (McIntyre, 2005). For example, there are several experiments published every year on the effects of mnemonic devices (Slavin, 2002). However, few, if any, of these experiments look at extensive use of mnemonics over the course of the year. Therefore, teachers may use a quick trick to teach the order of the planets or the steps to solve a trigonometric function, but such occasional tricks fail to address real instructional issues for students with LD such as improving reading comprehension or mathematical reasoning. In fact, a search of the WWC using the term *reading comprehension* in the area of children and youth with disabilities turns up only one program which was found to have no discernable effects.

Second, the type of knowledge research offers differs greatly from the type of knowledge teachers need to guide their practice (McIntyre, 2009). McIntyre (2009) describes the pedagogical knowledge used by teachers as ‘knowledge how,’ while the knowledge put forth in research is ‘knowledge that.’ The knowledge put forth by research is theoretical or propositional in nature, and fails to provide the context specific, systematic guidance needed to change

instructional behavior. Odom et al. (2005) note that due to the complex nature of special education, research in the field cannot simply examine whether or not a practice works, but instead must determine for whom the practice works and in what context. This information about the ‘who and where’ of a practice are the ‘knowledge how’ that teachers need to effectively implement practices with their students. Additional detail must be paid to implementation science (Cook & Odom, 2013). Approaches that promote the implementation of EBPs must provide systematic and ongoing supports, rather than the often-utilized train and hope approach. This lack of guidance when it comes to implementation is one reason why teachers distrust research findings.

Factors related to teachers’ use of research and its perceived value. Based on the limited research available, three key factors appear to contribute to the research-to-practice gap related to teachers’ use of research and its perceived value. First, many teachers report a lack of trust in educational research findings (Jones, 2009). If teachers do not trust the research used to identify EBPs, they are unlikely to make use of the identified practices. In addition to their mistrust of research, teachers report a lack of preparation related to their ability to interpret educational research and utilize it in the decision-making process. In her study of novice special educators, Jones (2009) found that teachers expressed a lack of confidence regarding their ability to understand published research. Additionally, teachers reported their pre-service teacher education programs failed to focus coursework on EBPs and the use of research to guide practice (Jones, 2009). These teachers also indicated they lacked the knowledge necessary to locate applicable research and lacked the time to explore research on their own (Jones, 2009).

Second, there is a lack of universal terminology related to EBPs that leads to confusion among teachers (Cook & Cook, 2011). Several similar terms exist which teachers and

researchers use interchangeably leading to confusion among teachers about level of evidence supporting these practices. Teachers frequently fail to distinguish EBPs from these other related terms (Cook & Cook, 2011). In addition to the term EBP, best practice, RBP, and effective practice are also common terms in education (Cook et al., 2012). Though they sound like virtual synonyms, these terms have very different meanings, as defined in Chapter 1. When looking at the similarities among these terms, it is easy to see how confusion arises. Well-meaning teachers may believe they are using EBPs when in fact they are only using best or effective practices that lack a sufficient research base. For example, Burns & Ysseldyke (2008) found Social Skills Training to be an instructional strategy used almost every day by 55.7% of special education teachers in their study. However, Social Skills Training was found to have a mean effect size of only 0.21 through meta-analytic research. Therefore, despite the fact that Social Skills Training lacks a sufficient research base to be considered an EBP, many teachers utilize this practice, perhaps because it has been recommended to them by colleagues or other respected sources. By utilizing ORCs to access high-quality, pre-appraised evidence, appropriate EBPs for students with LD can be identified, and practices that lack a sufficient research base can be avoided.

Third, there is a disconnect between the amount of research being produced and teachers' access to the information which is available to them (Powers et al., 2011). It is commonly assumed that teachers have ready access to the various ORCs that provide current research reports. It is also assumed that teachers will search for relevant research in an unbiased way, rather than only seeking evidence to support their preconceived notions about classroom practices (Powers, 2005). However, Powers (2005) reported a lack of readily available research evidence presented a significant barrier to the implementation of EBPs in schools. Powers proposed that in order to address these barriers and concerns, the complete details about EBPs

must be made easily accessible to teachers in a concise format. It is unclear in Powers' study whether teachers were even aware of the existence of ORCs for EBPs, or if they simply lacked the knowledge of how to search such sites for relevant information. Unfortunately, a search of the available literature turned up no studies that explore teachers' knowledge about the existence of ORCs or their knowledge of the resources available at the ORCs discussed earlier in this chapter. This represents a gap in the literature base that should be addressed through future study. Each of the factors contributing to the research-to-practice gap outlined above points to a clear need to educate teachers on the readily available EBP resources accessible through ORCs. This idea of translating evidence to practice will be addressed in the following section.

Section 7: Translating Evidence to Practice

One potential way to understand the current situation with EBPs in education is to look at the development of evidence-based medicine. In 1996, Sackett, Rosenberg, Gray, Haynes, and Richardson, published an article in *The British Medical Journal* that defined the term evidence-based medicine. This marked a shift in the culture of medicine that moved away from decision-making based on professional judgment and past practice towards a system that relied on evidence from research to guide clinical practice (Georgiou, 2002). The growth of evidence-based medicine has relied heavily on the development of clinical information systems to collect research evidence and disseminate it to those who make clinical decisions. Examples of systems currently used in the medical field include the computerized decision support system that is part of the U.S. Veteran's Administration electronic medical records or the Prodigy system funded by the Department of Health (Haynes, 2006; Windish, 2013). These computerized decision support systems take individual patient data contained in an electronic medical record, and apply complex algorithms to generate patient-specific assessments and recommendations for

practitioners (DiCenso et al., 2009). These information systems represent the highest level of evidence available in the 6S Model and are readily able to connect practitioners to the most current EBPs in the medical field. Systems such as these and other high-level pre-appraised evidence resources such as those described in the upper tiers of the 6S Model are necessary in order to effectively connect those who create knowledge with those who must apply it.

The information derived from research can only help to improve practice if that knowledge reaches the hands of practitioners (Curran, Grinshaw, Hayden, & Campbell, 2011). In the field of medicine, the term for this process is *knowledge translation*. Knowledge translation is “the process of moving from what has been learned through research to application in different decision-making contexts” (Curran et al., 2011, p.174). The process of knowledge translation involves synthesis, dissemination, and ethical application of research in order to improve the system (Khoddam, Mehrdad, Peyrovi, Kitson, Shultz, & Athlin, 2014).

Early research in the field of knowledge translation came from a variety of disciplines including agriculture, sociology, anthropology, and even education (Curran, Grimshaw, Hayden, & Campbell, 2011). The first major work in the field was Roger’s *Diffusion of Innovation*, published in the mid-1960s. Knowledge translation later took root in the medical field as quality improvement initiatives began to bring a halt to the “quick fix” mentality shifting to a focus on sustained research instead. Over the past decade, medicine has seen continued growth in the area of knowledge translation with the launch of the academic journal *Implementation Science* in 2006, the publication of Knowledge Translation Casebooks, and the development of initiatives such as the CIHR Knowledge Translation Strategy and Knowledge Utilization Studies Program at the University of Alberta in Canada. This growth has not been without challenge, and the field of knowledge translation in medicine continues to face conceptual and methodological

challenges. One primary challenge is the complexity of designing, implementing, and maintaining knowledge translation systems. Systems level resources depend on computerized decision-making models governed by complex algorithms (DiCenso et al., 2009). In order for such systems to remain on the cutting edge of evidence, they must be updated regularly to include new sources of information (Windish, 2013). Such systems must also be linked to personalized information databases such as those available in electronic medical records. Additionally, while the body of research evidence continues to grow, it remains difficult to apply this research systematically to draw conclusions about the most effective approaches in the nuanced practice of medicine. The nuanced nature of intervention applies in the field of education as well and will likely present a barrier to the development of effective knowledge translation systems in education, as it has in medicine. However, despite such potential barriers, the value that knowledge translation systems can bring to practice outweighs their limitations, and their development should continue to be a focus for researchers and policy makers.

The past 25 years have seen a rapid increase in the volume of research evidence, creating the need for more effective ways to catalog these vast resources for ease of access (Curran et al., 2011). The internet offers a powerful tool that could benefit many disciplines, including education, in their efforts to disseminate evidence (Jadad, Haynes, Hunt, & Browman, 2000). However, searching for information on the internet can be a time-consuming and frustrating process for practitioners and often returns conflicting results. Electronic databases and other ORCs have emerged as a key tool to facilitating online access to synthesized research (Curran et al., 2011). The medical field has developed such ORCs where by using specialized search strategies, practitioners can retrieve desired information. These ORCs, including databases such as ACP Journal Club, McMaster KT+, and Evidence Updates, interpret and disseminate

synthesized research evidence in a more user-friendly format. ACP Journal Club summarizes the best new evidence in the field of internal medicine from over 130 clinical journals (American College of Physicians, 2015). Research staff and clinical editors assess the scientific merit of medical studies as they are published. Following this evaluation, a worldwide panel of over 5000 physicians assesses the clinical relevance of the studies. Reviews are then published as a monthly feature in the *Annals of Internal Medicine*. McMaster KT+ is a resource maintained by McMaster University's Health Information Research Unit (McMaster, 2015). KT+ provides access to the current evidence on knowledge translation including published original articles and systematic reviews on health care quality improvement, continuing professional education, computerized clinical decision support, health services research, and patient adherence. Its purpose is to inform those working in the field of knowledge translation of new research as it is published. Evidence Updates is a searchable database of the best evidence from medical literature maintained by the BMJ Group and McMaster University's Health Information Research Unit (McMaster, 2015b). Evidence Updates provides access to current research to support evidence-based clinical decisions. All citations in the database receive two ratings. One is a pre-rating for quality issued by research staff, and the other is for clinical relevance and interest issued by at least three members of a worldwide panel of practicing physicians. There is a developing field of study that aims to better understand factors influencing clinicians' use of these, and other ORCs (Curran et al., 2011).

Over the past several years, ORCs have also emerged outside the field of medicine in disciplines such as social work and education. The goal of these ORCs is to move research into the hands of practitioners in an efficient and accessible manner (Soydan, Mullen, Alexandra,

Rehman, & Li, 2010). What began as simple online databases have now evolved into complex online portals with a variety of search capabilities and functions.

Conclusions

Throughout the twentieth century, the fields of medicine, psychology, agriculture, and technology have all made great strides due to application of research to practice (Cook, Smith, & Tankersley, 2012). Education has even gone as far as to mandate the use EBPs in instructional practice (ESSA, 2015). However, despite advances in other fields and legal mandates to incorporate research into educational decision-making, education continues to lag behind other fields in its development, dissemination, and implementation of EBPs (Cook et al., 2012). While a vast amount of educational research is being published related to EBPs, the mechanisms for disseminating such research evidence are failing to get usable research into the hands of teachers effectively (Vanderlinde & van Braak, 2010). ORCs present one avenue through which teachers can begin to access currently available, pre-appraised research to aide in the decision-making process. Through use of the 6S Model, teachers can evaluate the strength of the evidence they are drawing from ORCs to be sure they are utilizing the highest possible levels of evidence to select their classroom practices. In order to help move toward more effective dissemination of EBP resources for students with LD, it is first necessary to understand what teachers know about EBP resources that are currently available, and how teachers use these resources to guide current practice decisions that affect students with LD. In my search of the extant literature, I was unable to locate any studies that explored teachers' knowledge, use, or opinions of ORCs.

Purpose Statement

This study will use a quantitative survey methodology to explore teachers' knowledge, use, and opinions of ORCs for students with LD. During data collection, participants will

complete a questionnaire rating their own level of knowledge pertaining to five ORCs for EBPs, their use of these ORC, and their perception of the usefulness of such resources. Participants will include K-12 teachers currently working in the Carterville School District who teach students with LD.

This study will contribute to the existing literature by evaluating what teachers of students with LD currently know about ORCs, how they use these resources to access information for the instructional decision-making process, and their opinions of the usefulness of such resources. By understanding the current status of teachers' knowledge, use, and opinions of these ORCs, pre-service and in-service teacher education programs can develop better training programs to expand access and understanding of these resources. Through improved access and understanding of the resources available through ORCs, teachers' can increase their own capacity to access educational research and apply it to their practice.

Table 1

Essential and Desirable Quality Indicators for Group Experimental and Quasi-Experimental Research Articles and Reports

Essential Quality Indicators

Quality Indicators for Describing Participants

1. Was sufficient information provided to determine/confirm whether the participants demonstrated the disability(ies) or difficulties presented?
2. Were appropriate procedures used to increase the likelihood that relevant characteristics of participants in the sample were comparable across conditions?
3. Was sufficient information given characterizing the interventionists or teachers provided? Did it indicate whether they were comparable across conditions?

Quality Indicators for Implementation of the Intervention and Description of Comparison Conditions

1. Was the intervention clearly described and specified?
2. Was the fidelity of implementation described and assessed?
3. Was the nature of services provided in comparison conditions described?

Quality Indicators for Outcome Measures

1. Were multiple measures used to provide an appropriate balance between measures closely aligned with the intervention[^] and measures of generalized performance?
2. Were outcomes for capturing the interventions effect measured at the appropriate times?

Quality Indicators for Data Analysis

2. Were the data analysis techniques appropriately linked to key research questions and hypotheses? Were they appropriately linked to the limit of analysis in the study?
3. Did the research report include not only inferential statistics but also effect size calculations?

Desirable Quality Indicators

1. Were data available on attrition rates among intervention samples? Was severe overall attrition documented? If so, is attrition comparable across samples? Is overall attrition less than 30%?
2. Did the study provide not only internal consistency reliability but also test-retest reliability and interrater reliability (when appropriate) for outcome measures? Were data collectors and/or scorers blind to study conditions and equally (un)familiar to examinees across study conditions?
3. Were outcomes for capturing the intervention's effect measured beyond an immediate posttest?
4. Was evidence of the criterion-related validity and construct validity of the measures provided?
5. Did the research team assess not only surface features of fidelity implementation (e.g., number of minutes allocated to the intervention or teacher/interventionist following procedures specified), but also examine quality of implementation?
6. Was any documentation of the nature of instruction or series provided in comparison conditions?
7. Did the research report include actual audio or videotape excerpts that capture the nature of the intervention?
8. Were results presented in a clear, coherent fashion?

*A study would be acceptable if it included only measures of generalized performance. It would not be acceptable if it only included measures that are tightly aligned.

Gersten et al., 2005

Table 2
Quality Indicators for Single-Subject Research

Description of Participants and Setting

1. Participants are described with sufficient detail to allow others to select individuals with similar characteristics;(e.g., age, gender, disability, diagnosis).
2. The process for selecting participants is described with replicable precision.
3. Critical features of the physical setting are described with sufficient precision to allow replication.

Dependent Variable

1. Dependent variables are described with operational precision.
2. Each dependent variable is measured with a procedure that generates a quantifiable index.
3. Measurement of the dependent variable is valid and described with replicable precision.
4. Dependent variables are measured repeatedly over time.
5. Data are collected on the reliability or interobserver agreement associated with each dependent variable, and IOA levels meet minimal standards (e.g., IOA = 80%; Kappa = 60%).

Independent Variable

1. Independent variable is described with replicable precision.
2. Independent variable is systematically manipulated and under the control of the experimenter.
3. Overt measurement of the fidelity of implementation for the independent variable is highly desirable.

Baseline

1. The majority of single-subject research studies will include a baseline phase that provides repeated measurement of a dependent variable and establishes a pattern of responding that can be used to predict the pattern of future performance, if introduction or manipulation of the independent variable did not occur.
2. Baseline conditions are described with replicable precision.

Experimental Control/internal Validity

1. The design provides at least three demonstrations of experimental effect at three different points in time.
2. The design controls for common threats to internal validity (e.g., permits elimination of rival hypotheses).
3. The results document a pattern that demonstrates experimental control.

External Validity

1. Experimental effects are replicated across participants, settings, or materials to establish external validity.

Social Validity

1. The dependent variable is socially important.
 2. The magnitude of change in the dependent variable resulting from the intervention is socially important.
 3. Implementation of the independent variable is practical and cost effective.
 4. Social validity is enhanced by implementation of the independent variable over extended time periods, by typical intervention agents, in typical physical and social contexts.
-

Horner et al., 2005

Table 3
Summary of Online Resource Centers

ORC Name	Provides Evidence Ratings	Areas of Focus	Available Resources
Alerts Series	Yes	Academics, Assessment, and Instructional Approaches	Current Practice Alerts
Best Evidence Encyclopedia	Yes	Reading	Program Reviews (full reports), Educator's Guides, and Educator's Summaries
National Center on Intensive Intervention	No*	Academics and Behavior	Tools Charts
National Technical Assistance Center on Transition	Yes	Transition	Practice Descriptions
What Works Clearinghouse	Yes	Literacy and Behavior	Practice Guides, Intervention Reports, and Single Study Reviews**

*The National Center on Intensive Intervention issues an evidence rating for various components of reviewed studies, but does not issue an overall evidence rating for each practice.

**No Single Study Reviews for students with LD from the WWC were included in this dissertation study.

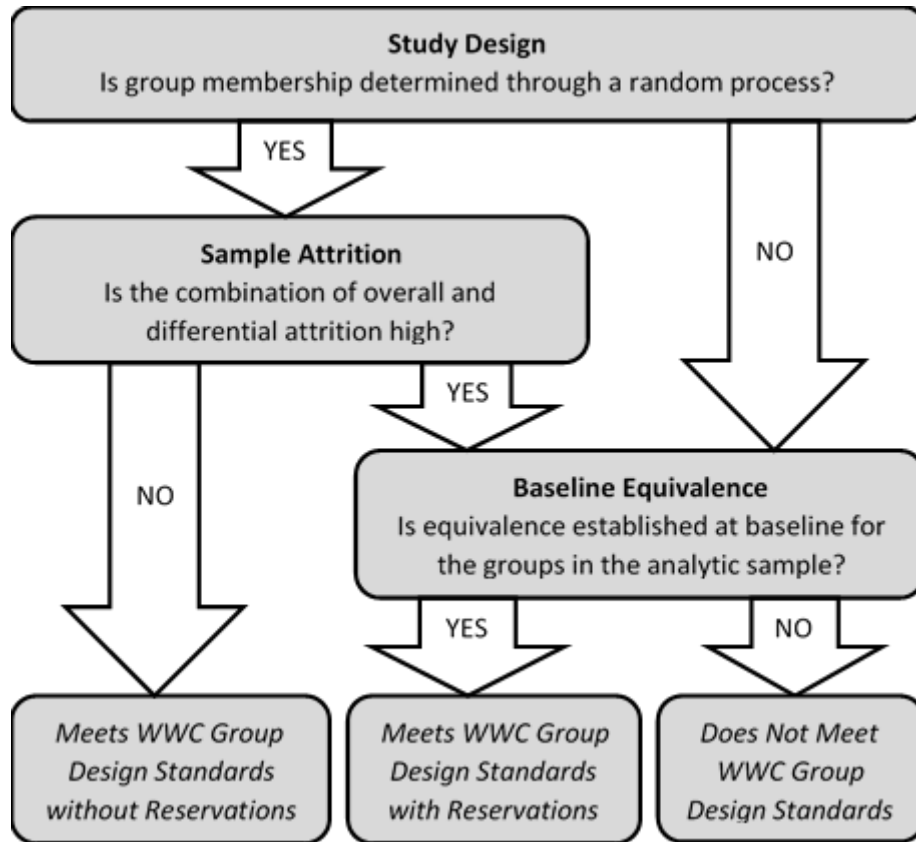


Figure 1. Determinants of a WWC Study Rating
What Works Clearinghouse Procedures and Standards Handbook, Version 3.0, 2015

Table 4
WWC Levels of Evidence for Practice Guides

Criteria	Strong Evidence Base	Moderate Evidence Base	Minimal Evidence Base
Validity	The research has high internal validity and high external validity based on studies that meet standards.	The research has high internal validity but moderate external validity or high external validity but moderate internal validity.	The research may include evidence from studies that do not meet the criteria for moderate or strong evidence.
Effects on relevant outcomes	The research shows consistent positive effects without contradictory evidence in studies with high internal validity.	The research shows a preponderance of evidence of positive effects. Contradictory evidence must be discussed and considered with regard to relevance to the scope of the guide and the intensity of the recommendation as a component of the intervention evaluated.	There may be weak or contradictory evidence of effects.
Relevance to scope	The research has direct relevance to scope— relevant context, sample, comparison, and outcomes evaluated.	Relevance to scope may vary. At least some research is directly relevant to scope.	The research may be out of the scope of the practice guide.
Relationship between research and recommendations	Direct test of the recommendation in the studies or the recommendation is a major component of the intervention tested in the studies.	Intensity of the recommendation as a component of the interventions evaluated in the studies may vary.	Studies for which the intensity of the recommendation as a component of the interventions evaluated in the studies is low, and/or the recommendation reflects expert opinion based on reasonable extrapolations from research.
Panel Confidence	Panel has a high degree of confidence that this practice is effective.	The panel determines that the research does not rise to the level of strong but is more compelling than a minimal level of evidence. Panel may not be confident about whether the research has effectively controlled for other explanations or whether the practice would be effective in most or all contexts.	In the panel's opinion, the recommendation must be addressed as part of the practice guide; however, the panel cannot point to a body of research that rises to the level of moderate or strong.
Role of expert opinion	Not applicable.	Not applicable.	Expert opinion based on Defensible interpretation of theory.
When assessment is the focus of the recommendation	Assessments meet the standards of The Standards for Educational and Psychological Testing	For assessments, evidence of reliability meets The Standards for Educational and Psychological Testing but with evidence of validity from samples not adequately representative of the population on which the recommendation is focused.	Not applicable.

What Works Clearinghouse Procedures and Standards Handbook, Version 3.0, 2015

Table 5
WWC Publications Related to Students with LD

Practice Guides (Reviews for students with disabilities, not specific to LD)	Intervention Reports (Reviews specific to students with LD)
<ul style="list-style-type: none"> • Assisting Students Struggling with Mathematics • Assisting Students Struggling with Reading 	<ul style="list-style-type: none"> • Alphabetic Phonics • Barton Reading & Spelling System • Dyslexia Training Program • Foundations • Herman Method • Lindamood Phoneme Sequencing • Peer-Assisted Learning Strategies • Project Read Phonology • Read 180 • Read Naturally • Reading Mastery • Reciprocal Teaching • Repeated Reading • Spelling Mastery • Unbranded Orton-Gillingham-based Interventions • Voyager Reading Programs • Wilson Reading System

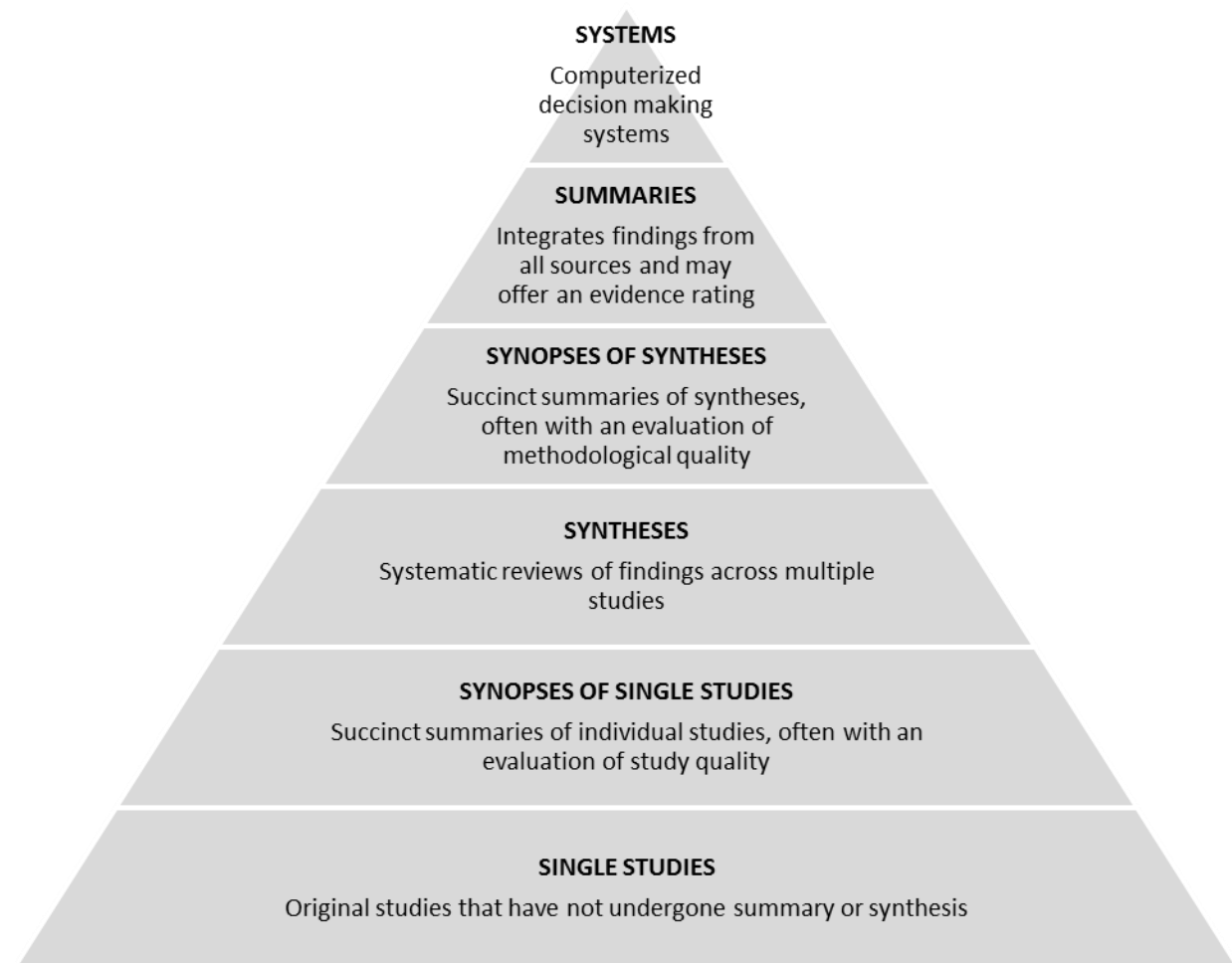


Figure 2. The 6S Model (DiCenso et al., 2009)

Table 6
 Summary of Evidence Levels for Online Resource Center Publications for Students with LD

	Alerts Series	Best Evidence Encyclopedia	National Center on Intensive Intervention	National Technical Assistance Center on Transition	What Works Clearinghouse
Summaries					Practice Guides
Synopses of Syntheses	No synopses of syntheses related to practices for students with LD are currently available at the five ORCs that will be the focus of this study.				
Syntheses	Current Practice Alerts	Best Evidence Syntheses		Practice Descriptions	Intervention Reports
Synopses of Studies			Study Synopses		Single Study Reviews

Table 7
Strengths and Weakness of the 6S Model's Levels of Evidence

Level on the 6S Model	Strengths	Weaknesses
1. Systems	<ul style="list-style-type: none"> • Customize practices and programs to individual needs 	<ul style="list-style-type: none"> • Need to be upgraded regularly
2. Summaries	<ul style="list-style-type: none"> • Often provide levels of evidence to help determine the strength of the existing evidence base 	<ul style="list-style-type: none"> • Need to be updated often to include new research • Guidelines vary across organizations so findings from one summary to the next may be inconsistent
3. Synopses of Syntheses	<ul style="list-style-type: none"> • Provide a summary of systematic reviews • Often review methodological rigor 	<ul style="list-style-type: none"> • Are time consuming to conduct and, therefore, may not be very current
4. Syntheses	<ul style="list-style-type: none"> • Integrate existing information • Establish the consistency of findings • Explain inconsistencies in data • Meta-analytic techniques can reduce bias and error 	<ul style="list-style-type: none"> • Often long and highly technical • Can exaggerate findings through poor methodology
5. Synopses of Studies	<ul style="list-style-type: none"> • Provide summaries and commentary for the reader which interpret the findings • Typically chosen due to their high-quality 	<ul style="list-style-type: none"> • Not all studies have a synopsis available
6. Single Studies	<ul style="list-style-type: none"> • Readily available both online and in print • Current and up to date 	<ul style="list-style-type: none"> • Practitioners must understand how to locate studies of interest • Searching can be tedious and time consuming

(Windish, 2013)

Table 8

Summary of Research Findings on Teachers' Reported Use of EBPs and RBPs in Special Education

	Burns and Ysseldyke, 2009	Easterbrooks, Stephenson, and Gale, 2009	Gable et al., 2012	Gagnon and Maccini, 2007	Stormont, Reinke, and Herman, 2011
Research Questions	What is the reported frequency of use of practices with large effects in the education of children with special needs and are practices with large effects reportedly used more frequently than those shown to be ineffective when educating children with disabilities?	Do teachers of students who are deaf or hard of hearing use independent reading and problem solving after the enculturation process? If so, to what level? If not, can a review improve their level of use?	What are teachers' perspectives regarding the (a) importance, (b) amount of use, and (c) level of preparation regarding 20 EBPs identified from a review of the literature?	What are teachers' perceptions of (a) definition of math; (b) familiarity with course topics; (c) effectiveness of methods courses; (d) preparation to use and frequency of use of effective instructional strategies; and (e) factors contributing to the use of effective instructional strategies?	What are general education teachers' levels of knowledge of evidence-based programs and their school's resources to meet the needs of children with mental, emotional, and behavioral needs?
Participants	174 special education teachers and 333 school psychologists.	23 teachers of students who are deaf or hard of hearing from three different schools	1,558 general education teachers and 1,472 special education teachers.	224 general education teachers who taught math and students in special education and 253 special education teachers	239 early childhood and elementary general education teachers.
Instruments	2 questionnaires of 12 items each asking participants to rate the frequency of use of certain practices that were pre-rated as effective, moderately effective, or ineffective.	Levels of use of the Innovation tool – A questionnaire used through an interview protocol that was designed to identify concerns that people have when implementing an innovation. Lesson plan examination.	Researcher developed questionnaire using a Likert scale rating system to evaluate the perceived level of importance, usage, and level of preparation to implement each of 20 EBPs.	Researcher developed questionnaires, one for general education teachers and one for special education teachers, with ordinal and closed-ended questions regarding the five research questions.	Researcher developed 42-item questionnaire using a Likert scale rating system to elicit information on participants' attitudes, knowledge, and beliefs on the school's role in providing supports for students' mental health and their perceptions and knowledge towards EBPs in schools.

	Burns and Ysseldyke, 2009	Easterbrooks, Stephenson, and Gale, 2009	Gable et al., 2012	Gagnon and Maccini, 2007	Stormont, Reinke, and Herman, 2011
Significant Findings	<p>Nearly 90% of respondents reported using direct instruction at least once per week. School psychologists also rated direct instruction as the most frequently used strategy.</p> <p>Approximately 75% of respondents reported using modality instruction, formative assessment, and social skills training at least once per week.</p> <p>School psychologists rated mnemonic strategies as the most effective practice included in the questionnaire, but was ranked 6th in frequency by special education teachers and 3rd in frequency.</p> <p>Both special education teachers and school psychologists ranked last in effectiveness and last in frequency perceptual motor training.</p>	<p>Teachers as a group did not make significant gains in their ratings on the Levels of Use tool.</p> <p>Individual teachers did make gains compared to themselves at pretest.</p>	<p>15 of the 20 EBPs were rated as important or very important by at least 80% of the special education teachers while the general education teachers rated only 11 of the 20 EBPs important or very important.</p> <p>91% of general education teachers and 86% of special education teachers indicated that they “usually used” or “always used” only one of the classroom level practices.</p>	<p>General education teachers reported a higher level of preparation to use instructional techniques consistent with NCTM standards than special education teachers did.</p> <p>Special education teachers reported greater use of direct instruction, feedback and reinforcement, mastery learning, and graphing student progress than their general education counterparts did.</p>	<p>Only 1 evidence-based intervention (PBIS) was recognized by the majority (78%) of teachers.</p> <p>82-92% of teachers had never heard of the remaining 9 practices.</p> <p>Agreement on whether the 9 remaining practices were, in fact, EBPs was less than 10% for each practice.</p>

	Burns and Ysseldyke, 2009	Easterbrooks, Stephenson, and Gale, 2009	Gable et al., 2012	Gagnon and Maccini, 2007	Stormont, Reinke, and Herman, 2011
Limitations	<p>The data from this study are not able to address the question of why certain practices are used more frequently than others are.</p> <p>The two groups' responses are not directly comparable since the questionnaire formats varied across groups.</p> <p>The low response rate could be a source of bias.</p>	<p>Small sample size.</p> <p>Minimal intervention given to veteran teachers participating in the study.</p> <p>Self-report data were collected without the use of observation to confirm the accuracy of self-report.</p>	<p>The study relied upon self-report data that cannot be substantiated.</p> <p>There was a low response rate that could lead to bias.</p> <p>Misunderstanding of practices included in the questionnaire could have led to misinterpretation of questions and inaccurate responses.</p>	<p>Generalizability of the results is limited due to the small sample size and low survey return rate.</p> <p>Potential differences between respondents and nonrespondents were not evaluated.</p>	<p>Sample may not have been representative of all teachers.</p> <p>50% response rate may have led to a response bias in favor of teachers who knew more or cared more about emotional and behavioral issues.</p>

Chapter III

Research Methodology

This chapter will present a detailed description of the research methodology for this research study, including a description of the Tailored Design method of survey development, proposed data collection procedures, researcher's relationship with the participating district, a description of the setting and participants, and data analysis procedures. The goal of this study was to describe: (a) what teachers of students with LD in one suburban school district located in the mid-Atlantic region of the United States know about the five prominent online resource centers (ORCs), (b) if/how these teachers use these ORCs, (c) whether the teachers who use these online resources believe they are valuable for identifying appropriate practices to implement in the classroom for students with LD, and (d) whether different professional background indicators are correlated with higher levels of knowledge/use or a greater perceived value of such resources. As these ORCs continue to grow in scope and magnitude, it is important for key stakeholders in schools and districts to have an improved understanding of their use and value so as to maximize their use in the instructional decision-making process. Particularly, I have measured the self-reported level of knowledge and use of these ORCs in the school district in which I work as a Student Achievement teacher leader in order to improve practice among its educators and improve the academic performance of its students. A non-experimental, descriptive design and survey methodology have been used to answer the research questions for this study.

The Tailored Design Method

Data collection for this study took place via a web-based questionnaire created by me specifically for the purpose of this study following the principles of the Tailored Design method

described by Dillman, Smyth, and Christian (2014). This method allows for customization of the survey design procedures to the situation based upon knowledge of the researcher, respondents, resources, and time frame. It has been developed using an understanding of what causes people to behave in particular ways, known as social exchange. The social exchange principle, when applied to survey research, assumes that participants are most likely to respond to a questionnaire when they trust that the expected rewards will outweigh the anticipated costs of responding.

Three fundamental considerations underlie the Tailored Design method (Dillman et al., 2014). First, Tailored Design is an approach to conducting sample surveys with a focus on reducing the four types of error – coverage error, sampling error, nonresponse error, and measurement error – that may undermine the quality of the information collected. Given the small size of the sample for this study, and the potential to immediately apply the results to my own practice and that of my colleagues, it was important to maximize the quality of the data collected by reducing error. Coverage error can occur when the list from which the sample is drawn fails to accurately represent the true population. In this study, the entire population was invited to participate, so coverage error was not of concern. Sampling error describes the differences between estimates generated by a portion of the sample versus estimates generated by the whole sample frame. Again, for this study the entire population was invited to participate, so sampling error was also not of concern. Nonresponse error occurs when there is a difference between those who respond and those who do not. In order to reduce nonresponse error a personal connection between the participant and the potential research outcomes was highlighted, as well as my connection to the district and personal investment in the outcomes. Finally, measurement error occurs when respondents give inaccurate answers to survey questions due to an inability or unwillingness to answer truthfully. To reduce this type of error, questions

were kept simple and straight-forward with images of each ORC's homepage and clear wording for all questions in order to clarify meaning. Key terms were defined, and confidentiality³ of responses was guaranteed for all participants.

Second, the Tailored Design method involves developing a set of survey procedures that work together to encourage all sample members to respond to the survey (Dillman et al., 2014). It requires giving attention to all aspects of contacting and communicating with people. From the initial contact email, through all follow-up emails, and including the questionnaire itself, a close focus on wording and message prevailed. Contacts were personalized to the greatest extent possible. The time of day for each contact varied in order to consider participants changing schedules. The value of respondents' participation was emphasized in all email communications, and my sincere gratitude for their participation was expressed.

Finally, Tailored Design is about developing survey procedures that build positive social exchange and encourage response by taking into consideration elements such as survey sponsorship, the nature of the survey population and variations within it, and the content of the survey questions (Dillman et al., 2014). My academic connection to Arcadia University was explained in the invitation to participate, and the Arcadia University logo appeared on all pages of the questionnaire itself. The questionnaire was distributed through Qualtrics with my name included as the sender and my university email address as the reply option, in order to highlight the academic nature of the research. I took great care to emphasize the participants' connection to the data and the potential use of their responses to guide district initiatives to improve instruction.

³ All participants' responses will remain confidential. No personally identifying information will be collected as a part of this study. Participants' responses will be used for the purpose of data analysis related to the research questions only.

Together these elements served to maximize participation and the quality of the data obtained. In the following section on data collection, I will elaborate on the format and content of the questionnaire instrument itself, provide detail on the development process and expert panel review, and discuss in detail the administration procedures, including participant recruitment.

Data Collection

Data collection took place via a web-based questionnaire containing 28 questions which was distributed to participants electronically via email contact. A copy of the questionnaire instrument can be found in Appendix A. In this section I will present information on (a) the format and content of this questionnaire, (b) the questionnaire development process, and (c) administration procedures.

Format and Content of Questionnaire. The questionnaire contained four sections with a total of 28 questions. Section 1 included an introductory statement that also served as a screening question to ensure participants met inclusion criteria for participation in the study. Section 2 included three questions about participants' general use and opinions of educational research. Section 3 included specific questions about participants' knowledge, use, and opinions of the five ORCs. Finally, Section 4 included seven questions about participants' professional background information in order to compare the level of knowledge held across different sub-groups of interest. A detailed description of each section of the questionnaire is included below.

Section one. As recommended by Rea and Parker (2014) the questionnaire opened with an introductory statement (Q1). This statement included an explanation of the purpose of the study, an explanation of my affiliation with Arcadia University as a doctoral student and my affiliation with Carterville School District (CSD, a pseudonym will be used in place of the district name to protect participants confidentiality) as a current employee in the role of Student

Achievement Teacher Leader, a description of why participants were being invited to participate, an assurance that their responses were confidential and that no judgement or evaluation of teachers' responses in relation to job performance would take place, and a brief explanation of what would be required of them as a participant. As recommended by Peterson (2000) the introductory statement aimed to build rapport and personalize the study to the potential respondents, it provided sufficient information about the study so that participants could make an informed decision about their involvement, it requested their participation and their open and honest responses, and it assured the confidentiality of those responses. Additionally, the introductory statement remained relatively brief (Peterson, 2000). The introductory statement also served as a screening question to ensure that all participants met the two inclusion criteria for the study: 1) currently certified and working as a K-12 teacher in the Carterville School District, and 2) currently working with students with LD in an instructional capacity (meaning that any student for which the teacher has instructional responsibilities has been identified as a student with a learning disability who receives special education services). Through the use of a screening question, I hoped to ensure that all participants have met the inclusion criteria (Rea & Parker, 2014).

Section two. The second section of the questionnaire contained three questions about teachers' knowledge, use, and opinions of educational research not specific to the ORCs introduced later in the questionnaire. The first question (Q2) asked respondents, "Where do you search for resources and ideas to support your instructional decision making for students with learning disabilities?" Respondents were able to select as many answers as applied from the choices: academic journals, professional development materials, textbooks, websites, professional conferences, recommendations from colleagues, instructional coach or specialist,

recommendations from a supervisor or administrator, and other. For the website and other responses, an additional dialogue box was included for elaboration. The next question (Q3) asked, “How often do you use research to support your instructional decision making for students with learning disabilities?”. Respondents selected their answer from the options always, frequently, sometimes, rarely, and never. This question used contingent logic to determine if a follow-up question would be presented. In a questionnaire, contingency questions are presented dependent upon responses to earlier questions (Cohen et al., 2007). Such questions are used when certain questions are relevant to some respondents but not to others (Babble, 2011). Therefore, the follow-up question about how effectively teachers use these resources was only presented if respondents indicated that they do use educational research to some extent in their instructional decision-making process. Any respondent who selected never as his/her response to this question was automatically directed to section three of the questionnaire. The contingent follow-up question (Q4) asked respondents, “How effective is your current use of research in supporting instructional decision making for students with learning disabilities?” Respondents answered using a five-point rating scale with the options extremely effective, very effective, somewhat effective, not very effective and not at all effective. I selected a five-point rating scale based on the recommendations of Weisberg, Krosnick, and Bowen (1996). A five-point scale serves to provide an adequate range of options and allows for a mid-point. Additionally, for questions using rating scales, Artino et al. (2014) recommend labeling each response option, using only words as labels in place of numerical values, and maintaining equal spacing between response options so as to indicate equal variability between all response options. These recommendations were applied to the design of this questionnaire. Following their response to Q4, all respondents were forwarded to section three of the questionnaire.

Section three. Section three presented questions about the five ORCs which were the focus of this study: the Alerts Series, Best Evidence Encyclopedia, National Center on Intensive Intervention, National Technical Assistance Center on Transition, and What Works Clearinghouse. The first question in this section (Q5) defined the term “online resource center” as a web-based source of education research that has undergone systematic review. The question then asked, “Have you ever heard of any of the online resource centers listed below?” In addition to listing the names of the five ORCs, a picture of the home page of each was included for reference. I decided to include this picture in order to ensure proper recognition of the site and eliminate any confusion among the sites. Respondents were able to check all ORCs with which they were familiar. A “none of the above” option was also given for respondents who did not recognize any of the ORCs listed. Additionally, respondents could select “other” and list any additional websites which they believed to be ORCs. The next question, (Q6) asked respondents, “What type(s) of classroom issues or concerns for students with learning disabilities would lead you to seek information at an online resource center?” Respondents were asked to select all answers which applied from the choices: reading/English/language arts, STEM (science, technology, engineering, mathematics), behavior, social emotional learning, executive functioning/organization/study skills, assistive technology, and other. For the “other” option, a dialogue box was provided for participants to give a written response.

Following this question, each of the five ORCs was presented alphabetically with accompanying questions. For each ORC, respondents were again presented with a picture of the home page before answering any questions related to each site. Following the picture of each ORC’s home page, respondents were asked, “Have you ever visited this online resource center to identify instructional strategies or inform your practice for working with students with learning

disabilities?” Response options were yes and no. For each ORC, this question applied contingent logic such that if the respondent selected yes, two follow-up questions were presented for each site. The first follow-up question provided a list of the resources available at that ORC and asked respondents to select all resources which they have used. The options “none of the above” and “other” with space to list additional resources were also included for each ORC. The second follow-up question asked respondents, “How useful were the resources at [name of ORC] to inform your practice?” Ratings of usefulness were given using a scale with the options extremely useful, very useful, somewhat useful, not very useful, and not at all useful. Following the questions pertaining to the What Works Clearinghouse, respondents were forwarded to section four of the questionnaire.

Section four. The final section of the questionnaire contained seven questions on participants’ professional background. These questions asked for information on level of education, teaching certifications, years teaching, grade levels taught, subject areas taught, primary responsibility, and type of students taught. Q22 asked, “What is the highest level of education you have completed?” and gave the answer choices Bachelor’s Degree, Master’s Degree, Doctoral Degree, and National Board Certification. In CSD, National Board Certification is paid equivalent to a Doctoral Degree on the salary schedule, so many teachers choose to obtain this certification. Data analysis for this question grouped Doctoral Degree and National Board Certification into one category for analysis since they are viewed as equivalent qualifications by the district. Q23 asked, “What teaching certifications do you hold?” and gave the options elementary education, special education, middle school, secondary, and other. For the choices middle school, secondary, and other respondents could also list certifications in an open dialogue box. Data analysis for this question evaluated both the level of certification and

number of certification held by each respondent. Q24 asked, “For how many years have you been teaching?” Response choices were given in bands including under 2 years, 2-5 years, 6-10 years, 11-15 years, 16-20 years, 21-25 years, and over 25 years. Q25 asked, “What grade level(s) do you teach? Respondents could select all applicable grades from a list of K-12. Data analysis for this question grouped grade levels into bands of K-4, 5-6, 7-8, and 9-12 as this is how the buildings in the district group students. Q26 asked, “What subject area(s) do you teach?” Again, respondents could select multiple responses to best describe their teaching responsibilities. Choices included: English/Language Arts, Math, Social Studies/History, Science, Foreign Language, Art, Music, Health/Physical Education, Business/Technology, Vocational Education, Special Education, and Other with an open dialogue box to include a written response. Q27 asked respondents, “How do you primarily describe yourself?” with answer choices of special education teacher and general education teacher. The final question in this section, Q28 asked, “What type(s) of students do you teach?” Respondents were directed to select all answers which applied from the choices Students without disabilities, Students with Learning Disabilities, and Students with disabilities other than Learning Disabilities.

Education level, certifications, grade level, subject areas, and years of experience have been documented in the extant literature as variables of interest for analysis (Brindle, Graham, Harris, & Hebert, 2015; Gillespie, Graham, Kihara, & Hebert, 2013; Paynter et al., 2016). For this study, type of students and primary responsibility were added to this list of variables in order to analyze differences between classrooms based on their teacher characteristics and student populations. The relationships between each of these professional background variables and teachers’ knowledge, use, and opinions of ORCs were the subject of data analysis and will be presented in the next chapter.

Development Process. The questionnaire for this research study was developed using guidelines set forth in the extant literature (Babble, 2011; Christensen et al., 2011; Cohen et al., 2007; Peterson, 2000a; Peterson, 2000b; Peterson, 2000c; Rea and Parker, 2014; Weisburg et al., 1996). The design process involved four stages: 1) development of the questionnaire, 2) expert review panel, 3) analysis of expert panel responses and feedback, and 4) revision of questionnaire. In the following sections I will explain the principles of questionnaire development, the creation process, and procedures for expert review.

Principles of questionnaire development. Christensen et al.'s (2011) nine principles of questionnaire development guided the writing of items included in the questionnaire. Questions were designed to (1) match the research objectives, (2) be appropriate to the respondents being surveyed, (3) be short and simple to answer, (4) avoid being loaded or leading, (5) avoid double-barreled statements, (6) avoid double-negatives, (7) justify open- versus close-ended structure, (8) include mutually exclusive and exhaustive response categories, (9) incorporate appropriate types of response categories, (10) use multiple items to measure complex constructs, (11) be easy to use, and (12) be pilot tested (Christensen et al., 2011). Three of these principles were of particularly relevant to this proposed study and are described in more detail below.

Write items to match the research objectives. Writing well-aligned questions is critical in the development of any questionnaire instrument (Christensen et al., 2011). Well-aligned questions ensure the collection of appropriate data. This study aimed to measure three elements of importance: teachers' knowledge, use, and opinions of ORCs to identify EBPs for students with LDs. Ensuring the adequate measurement of each of these components required the careful drafting of questions to measure each component clearly and separately. Considerations for

reliability and validity of the questionnaire are addressed in the following section on expert review.

Determine whether close-ended or open-ended questions are needed. The questionnaire contained all close-ended questions; however, respondents were given the option to enter text when selecting the “other” answer choice in several instances. This answer choice allowed for elaboration and clarification of responses. The use of close-ended questions keeps the collected data as consistent as possible across all respondents, ensures respondents answer each question with information appropriate for analysis, and makes completion of the questionnaire faster and easier for the respondents.

Make sure the questionnaire is easy to use from the beginning to the end. Several aspects of the questionnaire design were intended to make it as user-friendly as possible. First, the content questions were placed at the beginning of the questionnaire, with professional background questions appearing last, in order to have participants responding to the most important and interesting questions when they were most likely to be fully engaged in the questionnaire process (Christensen et al., 2011). This practice has also been shown to result in the highest response rates. Also, contingency questions were included wherever possible to ensure that participants did not respond unnecessarily to irrelevant questions. Additionally, an image of each ORC’s homepages was included to help participants recognize each of the ORC websites. Finally, the questionnaire was kept relatively short in order to minimize the time commitment to complete it and to maximize participant response.

Questionnaire creation. The questionnaire for this study was developed by the researcher, as no existing instruments were able to be located to provide appropriate data. Questions were drafted to align with the research questions of the study using existing

instruments as models (Brindle et al., 2015; Gillespie et al., 2013). Brindle et al. (2015) and Gillespie et al. (2013) provided content and wording for professional background questions. In Brindle et al.'s (2015) study, participants were asked to indicate their educational level, certification, grade level, and number of years teaching, as well as characteristics about the classrooms in which they taught. Additionally, Gillespie et al. asked participants to indicate their educational level and number of years teaching. The following section will describe the process used to establish content validity through review by a panel of experts.

Expert review. To establish the content validity of the questionnaire, a panel of five experts completed the questionnaire to review the content and provide evaluative feedback. Content validity is defined as the degree to which an instrument measures specified objectives (Teddle & Tashakkori, 2009). Expert panel review is one method recommended in the literature to establish content validity (Fitzpatrick, 1983; Lawshe, 1975). The expert panel was comprised of teachers who are not employed by CSD, and thus, were not eligible to participate in the actual study. The panel consisted of an odd number of participants in order to allow for a majority vote to be reached on the adequacy of each question. Panelists were strategically selected to ensure each of the following categories was represented by at least one person.

- General education teacher
- Special education teacher
- Teacher from grades K-2
- Teacher from grades 3-5
- Teacher from grades 6-8
- Teacher from grades 9-12

Recommendations for establishing a representative sample to serve as a review panel were adapted from Realdine's (2016) dissertation study.

Review guidelines. The expert panel evaluated the clarity and relevance of each question using a three-point rubric modeled off the work of Realdine (2016). For all questions, panelists evaluated the clarity of wording using the responses: 1) Not clear, 2) Somewhat clear, or 3) Clear. For all questions, excluding those in the professional background portion of the questionnaire, panelists evaluated the relevance to the research questions using the responses: 1) Not relevant, 2) Somewhat relevant, or 3) Relevant. Panelists were asked to provide suggestions for revision when rating any item as a 1 or a 2 on either scale. According to Lawshe (1975), when all experts agree that an item is clear/relevant, then it can be safely assumed that their consensus justifies the inclusion of the item in the final questionnaire. However, as consensus approaches 50% or lower, significant concern can be raised as to the validity of the question. For all items on the questionnaire with the exception of Q4, four or more panelists agreed that the content was clear/relevant. These items were included without revision in the final version of the questionnaire. Q4 was rated as clear/relevant by three panelists and somewhat clear by two panelists. This item was revised using the recommendations of the panel and my committee and was included in the final questionnaire with revised wording. No items failed to be rated as clear/relevant by fewer than three panelists.

Administration Procedures. The final questionnaire for this study was created and hosted on the web-based platform, Qualtrics using an account through Arcadia University. Participants were recruited via email. All participants accessed and completed the questionnaire online. The following sections will provide detailed information on the recruitment procedures

and study timeline, questionnaire access and completion considerations, and participant protections.

Recruitment procedures and study timeline. Participants were recruited for this study via email contact using school district email addresses. All CSD teachers (N = 410) received an invitation to participate in the study, though not all met inclusion criteria (see Appendix B). This email invitation included a brief description of the study as well as the URL link for participants to access the questionnaire online. Participants were able to click on the URL link in the email to be directed to the questionnaire, or they could choose to copy and paste the URL into a web browser. Two follow-up emails were sent at approximately one week intervals from the initial email. Multiple contacts were made, as sending multiple contacts to potential respondents has been shown to effectively increase response rates (Dillman et al., 2014). In one study, using four follow-up contacts resulted in a 37 percent increase in response rate over sending only an initial invitation (Olsen, Call, & Wygant, 2005). However, little research has been done on the ideal number of follow-up contacts. In an effort to increase response rates without sending too many unsolicited emails, the number of follow-up emails was kept to two. Therefore, the questionnaire remained live and open for responses for a period of three weeks. Follow-up emails were sent at varying times of day and across different days of the week according to the schedule below.

- Initial Contact – Monday morning at approximately 7:00 am
- First Follow-Up – Tuesday mid-day (8 days after initial contact) at approximately 12:30 pm
- Second Follow-Up – Thursday mid-afternoon (9 days after first follow-up) at approximately 5:30 pm

The survey remained open for three days following the second follow-up email. There is some evidence that email invitations are most successful if delivered to recipients early in the morning, so the initial request for participation occurred at this time of day (Dillman et al., 2014). The two follow-up emails were sent around mid-day and in the early evening. A copy of all email contacts used as a part of this study can be found in Appendix B.

Questionnaire access. The questionnaire for this study was hosted online via the web platform, Qualtrics. Participants accessed the questionnaire using the URL link provided in the email invitation. This link directed them to the introductory screen of the questionnaire. Once the screening and consent question was answered, respondents who qualified for participation were automatically taken to the first content question (Q2). Related questions appeared together on a single page. Questions requiring contingent logic were managed by the Qualtrics system, therefore, only relevant questions were presented to respondents.

Participant protections. All participants in this research study gave their informed consent to participate through the initial screening question on the questionnaire. Researcher contact with the participants was limited to email contact through school district email. At no time were participants asked to provide their name or any additional contact information. All responses to the questionnaire were collected through the third-party server, Qualtrics, and did not include participant names or other identifiers. Participation in the study was completely voluntary and no coercion or reward was used to recruit participants. Participants could terminate their participation in the questionnaire at any time without penalty by closing their web browser. All partial responses were recorded, but excluded from analysis. As per Dillman, Smyth, and Christian's (2014) recommendation, the questionnaire included a back button to allow participants to review/change previous answers. Additionally, the questionnaire did not

include a graphical progress indicator, as such indicators have been shown to have little impact on participant breakoff (Dillman et al., 2014).

Researcher's Relationship with Participating District

I have been employed by CSD since 2007 as a special education teacher and teacher leader. I am currently the Student Achievement Lead Teacher, Instructional Coach, and Testing Coordinator at the district high school. As a teacher leader, I have responsibilities related to the overall achievement needs of students with LD as well as the general high school population. In this role, I see that the instructional needs of the school are not all being met in a way that ensures the high achievement of all students. EBPs have been shown to positively impact the academic achievement of students with LD, and I believe that greater implementation of EBPs in CSD could improve the district's academic standing. Therefore, the results of this study have the potential to impact my professional experience and the learning outcomes for the students of CSD. With the information gained through this study, I hope to identify potential steps to increase the knowledge and use of ORCs by the teachers within the district in an effort to increase the use of EBPs with students with LD.

As a member of the CSD community, I have professional relationships and frequent contact with many of the teachers who were invited to participate in this study. At no time prior to, or during the questionnaire distribution period did I discuss completion of the questionnaire with any of my colleagues who were eligible for participation in the study, except to express my gratitude when informed by participants of their completion of the questionnaire. I in no way attempted to use my personal relationships to increase or influence participation in the study. In the introductory statement of the questionnaire, I indicated the following: "Meredith Gapsis is an employee of the Carterville School District. She holds no evaluative responsibilities, and your

participation in this study will in no way impact your employment” in an attempt to reduce any potential concern participants may have had regarding their participation in the study.

Setting and Participants

Setting. Data collection for this study took place in the Carterville School District. CSD is located in a suburban area adjacent to a major city in the Mid-Atlantic region of the United States. The district serves a racially and socio-economically diverse community of approximately 37,000 residents. According to the district website, CSD is home to approximately 4,600 students in grades K-12 and operates four K-4 elementary schools, one 5-6 upper elementary school, one 7-8 middle school (currently situated across three campuses during building reconstruction), and one high school serving students in grades 9-12. The school district’s student population is comprised of 53% African American students, 35% Caucasian students, 7% Asian students, 4% Hispanic students, and 1% students of other races. The district is fully inclusive and offers a broad range of special education services. A more detailed description of the special education services and the students who receive these services is included below.

Students receiving special education services. According to Penn Data reporting information available online from the Pennsylvania Department of Education (PDE, 2016), CSD provided special education services to a total of approximately 740 students in the 2015-2016 school year, the most recent year for which data is available. This represented approximately 16% of the total student population at that time. Students with LD represent the greatest percentage of students receiving special education services at 48%, followed by Other Health Impairment at 15%, Autism at 12%, and Emotional Disturbance at 10%. Students identified as other disability categories served by CSD include Intellectual Disability and Speech and

Language Impairment at approximately 6% each. No students with Deaf-Blindness, Hearing Impairment Including Deafness, Multiple Disabilities, Orthopedic Impairment, Traumatic Brain Injury, or Visual Impairment Including Blindness were enrolled in CSD and receiving special education services for the 2015-2016 school year.

In CSD students with LD receive a range of services depending on the specific needs outlined in their IEPs. Information about the district services described below was provided by Beverly Gallagher, Director of Special Education. All schools within the district provide a continuum of services ranging from itinerant to full-time placements. The specific service delivery model varies somewhat by grade/building level.

The four district elementary schools offer three broad categories of support: full-time learning support, pull-out resource support, and push-in resource support. Students in the full-time learning support class receive instruction in the learning support classroom for all academic subjects (English/language arts, math, science, and social studies). For homeroom and special area classes (art, music, PE, and library), students in full-time learning support join their general education peers in the general education classroom. Pull-out support at the part-time and itinerant levels is also offered at the elementary schools. Students receiving pull-out support attend class in the general education setting for the majority of the day, but are pulled out of the general education classroom for skill instruction in their areas of need in a learning support setting. Most frequently students are pulled out for reading and/or math. Finally, students can receive push-in supports in the general education classroom. These students are fully enrolled in the general education curriculum and only receive accommodations and modifications within this setting.

At the middle and high school levels, students with LD also receive a continuum of supports. Students receiving full-time learning support are enrolled in a learning support class for each of their academic subjects. Students receiving support at the part-time or itinerant level are enrolled in a learning support class in their area of need, but not for all academics. Part-time and itinerant students may also be enrolled in a co-taught class for academics where modifications and accommodations are provided through the support of a co-teacher certified in special education who supports the content area teacher's instruction. Additionally, students receiving support at the part-time or itinerant level can also receive services in an Academic Seminar, or resource, class for English/language arts, math, or organization and study skills. At the high school level, students with significant needs in the area of reading are provided intervention through the Read180 program. This is currently the only intervention program in place at the high school.

Participants. Participants in this study were recruited from the population of teachers employed by CSD. This represents a convenience sample, as CSD is the district in which I am currently employed as a Student Achievement Lead Teacher, Instructional Coach, and Testing Coordinator. At the time of distribution, the district employed 410 teachers, with myself excluded from this count. According to the school district website, the breakdown of teachers across buildings in May 2017 was as follows: High School – 130 teachers, Middle School – 75 teachers, Upper Elementary School – 60 teachers, Elementary A – 42 teachers, Elementary B – 43 teachers, Elementary C – 33 teachers, and Elementary D – 38 teachers. Pursuant with district policy, demographic and professional background information about employees is not made publicly available.

Response rate: All teachers (N = 410) within CSD were invited to participate in this study, however not all met inclusion criteria for the study. Teachers who do not hold instructional responsibilities for students with LD were disqualified. Inviting all teachers to participate offered the greatest likelihood of obtaining enough responses to conduct comparative analysis between groups based on professional background categories. Many of the procedures and strategies described in previous sections of this chapter were utilized because they have been shown to help increase the likelihood of response (Dillman et al., 2014). These strategies include:

- The questionnaire was accessible from multiple browsers, including mobile.
- Respondents were able to stop the questionnaire, save their progress, and complete it at a later time.
- Multiple follow-up emails were sent to remind the participant of their invitation to the study.
- Email contacts were made across varied times of day and days of the week.

The target return rate for this proposed study is 60%. This is an ambitious goal, as response rates for web-based questionnaires tend to vary greatly from about 30-60% (Fowler, 2009). However, I hope that the immediate relevance and personal connection to the data will help increase the likelihood of response among invited participants.

Limitations. Using a small convenience sample may present certain limitations. Primary among these is the limited ability to generalize the results of the study due to the fact that the sample is not representative of the national population of teachers (Rea & Parker, 2014). However, the findings can be obtained at a minimum cost in terms of money and time, and can be used to elaborate upon nuances, themes, and patterns already identified informally by the

researcher. Additionally, the use of a non-validated questionnaire will also limit the generalizability of the results as the reliability of the measure will be called into question.

Data Analysis

This study contains quantitative research questions. Data analysis will make use of descriptive statistics, one-way analysis of variance (ANOVA), and independent samples t-tests. A detailed description of the data analysis for each research question and sub-question is explained below.

Research Question 1: Do K-12 teachers of students with learning disabilities know about and use the five online resource centers? This question contains two separate measures which will require two methods of analysis. To report on teacher's knowledge of ORCs, I will calculate the average number of ORCs known across participants, as reported in Q4. Since the data will be ordinal in nature the most appropriate measure of central tendency to report is the arithmetic mean (Rea & Parker, 2014). To report on teachers' use of ORCs, I will again calculate the average number of ORCs used by each teacher, as reported in Q7, Q10, Q13, Q16, and Q19 and report the arithmetic mean. I will provide frequency counts for each ORC, reporting how many teachers have used each and what percent of participants this measure represents.

Research Question 1a: What resources do K-12 teachers of students with learning disabilities make use of at these sites to determine classroom practice? To report on the specific resources used by teachers at each ORC, I will again report frequency counts from participants' responses to Q8, Q11, Q14, Q17, and Q20 for each resource and indicate what percent of participants report using each.

Research Question 2: Do K-12 teachers of students with learning disabilities believe that the five online resource centers in this study are a valuable tool to use in determining practice? To answer this question, participants will rate each of the five ORCs usefulness using a five-point Likert scale in Q9, Q12, Q15, Q18, and Q21. For each ORC, I will report the mean usefulness score. I will also compute an overall usefulness score as an average rating across all five sites.

Research Question 3: Does a teacher's level of education, area of certification, number of years teaching, grade levels taught, subject areas taught, primary role, and/or type(s) of students taught impact their self-reported level of knowledge, use, or opinions of online resource centers for EBPs? Data for this question will be collected in Q22, Q23, Q24, Q25, Q26, Q27, and Q28. One-way ANOVA will be used to compare group means for each of the professional background indicators (level of education, certifications, number of years teaching, grade levels taught, subject areas taught, and type(s) of students taught) in order to determine statistical significance. A Bonferroni correction will be applied to these comparisons to correct for an inflated risk of Type I error. For level of education, the Doctoral Degree and National Board Certification will be combined as one group as the district views these as equivalent credentials. This will allow for a better group comparison, as few teachers hold this level of education. To conduct comparisons for based on teachers' certifications, two comparisons will be made. I will compare groups based on the subject areas of certification as well as the number of certifications held by the participant. An independent samples T-test will be used to compare group means for participants' primary role since this variable only has two response options. See Table 9 for a complete breakdown of research questions, questionnaire item numbers, and method of analysis. Data analysis will be conducted using the IBM SPSS software package.

Table 9
Method of Analysis by Research Question

Research Question	Questionnaire Item Number(s)	Method of Analysis
1. Do K-12 teachers of students with learning disabilities know about and use the five online resource centers?	Knowledge – Q4 Use – Q7, Q10, Q13, Q16, Q19	Knowledge – Frequency count and arithmetic mean Use – Frequency count and reported percent
1a. What resources do K-12 teachers of students with learning disabilities make use of at these sites to determine classroom practice?	Q8, Q11, Q14, Q17, Q20	Frequency counts and reported percent
2. Do K-12 teachers of students with learning disabilities believe that the five online resource centers in this study are a valuable tool to use in determining practice?	Q9, Q12, Q15, Q18, Q21	Arithmetic mean
3. Does a teacher's level of education, area of certification, number of years teaching, grade levels taught, subject areas taught, primary role, and/or type(s) of students taught impact their self-reported level of knowledge, use, or opinions of online resource centers for EBPs?	Q22, Q23, Q24, Q25, Q26, Q27, Q28	One-Way Analysis of Variance and Independent Samples T-Test

Chapter IV

Results

The purpose of this study was to describe teachers' knowledge, use, and opinions of online resource centers for students with learning disabilities. To achieve this goal, I distributed a 28-item questionnaire to all teachers ($n = 410$) in one suburban school district outside Philadelphia. Data analysis consisted of descriptive and inferential statistics using frequency counts, reported percentages, arithmetic means, one-way ANOVA, and independent samples *t*-test. Results related to the primary and secondary research questions are presented below beginning with an overview on the response rate.

Response Rate

A total of 410 teachers were invited to complete the questionnaire. Of the 410 teachers invited, 102 began the questionnaire (24.88%). Four of these participants indicated that they did not currently have instructional responsibilities for students with learning disabilities, so they did not proceed to the content questions. An additional 18 participants began the questionnaire, but did not submit answers to all questions. However, all responses, including partial responses were kept and included in the data analysis to the greatest extent possible, as no participants indicated they wished to cancel their response. Therefore, the overall response rate for the questionnaire was 20.49% ($n = 84$).

Participant Professional Background Information

Questions 22-28 were used to assess participants' professional backgrounds. Specifically, these questions asked about degrees held, certifications held, years teaching, grade levels taught, subject areas taught, and primary teaching responsibility. Of the 102 respondents, only 84 completed the questions in the professional background portion of the questionnaire. A

detailed analysis of each question is presented below. See table 10 for a summary of the participants' professional background information.

Question 22: Level of education. A total of 84 participants responded to the item asking about level of education. The majority of participants held a Master's degree (86.9%, $n = 73$). An additional 9.52% ($n = 8$) held a Bachelor's degree. In the district where these participants are employed, a Doctoral degree and National Board certification are recognized at the same level on the salary guide. Two participants (2.38%) held a Doctoral degree and one (1.19%) held National Board certification.

Question 23: Teaching certifications. For this question, participants were allowed to select multiple responses. A total of 158 different certifications were held by the 84 participants. The most held certification was elementary education with 48 participants holding this certification. The next greatest frequency was secondary education with 40 participants holding this certification. Participants were asked to provide specific content areas within their secondary certification. The most frequently reported secondary content certifications were in English and science, each with eight participants. The next most frequent area of certification was in world language with six participants. The remaining certifications all had fewer than five responses and were broken down as follows: art – 4, reading specialist – 4, social studies/history – 4, early childhood education – 2, music – 2, principal – 2, counseling – 1, health/physical education – 1, instructional technology – 1, library – 1, speech and language – 1. After secondary certification, the next most frequent certification was in special education with 27 participants, followed by middle school certification with 24 participants. For participants selecting middle school certification, a prompt to provide the specific area of certification was also given. The most frequently held middle school certification was in math with ten responses,

followed by English and science each with four responses. Art certification was held by two middle school participants. Counseling, health/physical education, social studies, and world language each had one response.

Question 24: Years teaching. Question 24 asked participants how many years of teaching experience they held. The greatest percentage of participants (21.43%) have been teaching for 11-15 years ($n = 18$). The next largest percentage (20.24%) of participants have been teaching for 6-10 years ($n = 17$). A total of fourteen participants (16.67%) have been teaching for 16-20 years, and another 13 participants (15.48%) have been teaching for over 25 years. With ten participants each (11.9%) were the categories of 2-5 years and 21-25 years. The smallest percentage (2.38%) was for teachers with less than one year of experience ($n = 2$).

Question 25: Grade level taught. Question 25 asked participants what grade level or levels they teach. Participants could select as many grade levels as applied. Participants were clustered in the high school grades, with 43 participants teaching 11th grade, 41 participants teaching each 10th and 12th grade, and 37 participants teaching 9th grade. The numbers of participants in the primary and middle grades were lower, breaking down as follows: kindergarten – 10 participants, 1st grade – 11 participants, 2nd grade – 9 participants, 3rd grade – 12 participants, 4th grade – 11 participants, 5th grade – 6 participants, 6th grade – 6 participants, 7th grade – 8 participants, and 8th grade – 7 participants.

Question 26: Subject area taught. Question 26 asked participants to indicate what subject area they teach. Participants could select as many subjects as apply. The greatest number of participants indicated that they teach English/language arts or math with 30 responses each. Science and special education were tied for the second most frequently taught subject areas with 21 responses each. Fifteen participants indicated that they taught social

studies/history, and another eight participants taught foreign languages. With four responses each were teachers of art and health/physical education. Two participants indicated that they taught music, and one was a vocational education teacher. There were 12 participants who indicated “other” as their response and entered a description in the text field. These responses included: behavioral support, counseling, functional reading/math/independent living, gifted ($n = 2$), library ($n = 2$), reading, and speech/language.

Question 27: Primary role. In question 27, participants were asked to give their primary role in the classroom from the choices “special education teacher” or “general education teacher.” Of the 82 responses to this question, 57 (69.51%) classified themselves as general education teachers, and 25 (30.49%) classified themselves as special education teachers.

Question 28: Type of students taught. Question 28 asked participants to indicate the type of students in their classrooms given these three choices: students without disabilities, students with learning disabilities, and students with disabilities other than learning disabilities. Students with learning disabilities were the most frequently reported group with 77 participants teaching this type of student. Students with disabilities were taught by 65 participants, while 64 participants taught students without disabilities.

Summary of professional background information. As evidenced in the data above, a wide range of teachers completed this questionnaire. Of the 102 total participants, only 84 completed questions in the professional background section of the questionnaire. However, these teachers represented the full range of possible responses. For each question in the portion of the questionnaire, at least one participant was recorded for each category or answer choice with one exception. No business/technology teacher participated in the study.

Teachers' Knowledge and Use of Online Resource Centers

This section will present findings related to research question 1: *Do K-12 teachers of students with learning disabilities know about and use the five online resource centers?* And question 1a: *What resources do K-12 teachers of students with learning disabilities make use of at these sites to determine classroom practice?*

Teachers' knowledge of online resource centers. Question 5 asked participants if they had ever heard of the five online resource centers which were the focus of this study. Participants were asked to select multiple answers to best represent their knowledge of the listed resources. A total of 58 responses were recorded representing the knowledge of 29 respondents (34.5%). The greatest number of respondents ($n = 19$) were familiar with the Alerts Series from the Council for Exceptional Children. Fifteen respondents indicated being familiar with the What Works Clearinghouse. Ten respondents were familiar with the National Center on Intensive Intervention. There were eight respondents who were familiar with the National Technical Assistance Center on Transition, and four who were familiar with the Best Evidence Encyclopedia. On average, participants were familiar with fewer than one resource center ($\bar{x} = 0.62$). However, among participants who were familiar with any ORC, the average number known increased by over three times ($\bar{x} = 1.87$). Two respondents selected "other" as an answer choice and listed SmartBrief and art lesson websites as online resource centers.

Teachers' use of online resource centers. Several questions related to teachers' use of the various online resource centers. Question 6 asked teachers what types of classroom issues or concerns for students with learning disabilities would lead them to seek information at an online resource center. A total of 84 participants provided responses to this question. The most frequently reported cause for teachers to seek information from an ORC was for behavioral

interventions ($n = 71$). Following behavior, the second most frequent cause for teachers to seek information from an ORC was for social emotional learning ($n = 60$). Executive functioning/organization/study skills was the third most frequent ($n = 47$) cause for a teacher to seek information from an ORC. All three of the top reasons that teachers reported were related to what are commonly seen as special education issues. The top cited academic reason ($n = 46$) to seek resources from an ORC was for reading/English/language arts, followed by STEM (science, technology, engineering, mathematics, $n = 32$), and assistive technology ($n = 25$). Seven people selected the option for “other” and listed the following reasons to seek information from an ORC: assessment, life skills, managing wrap-around services, music, RtII/MTSS, and speech/language.

The remaining questions pertaining to participants use of ORCs were site specific. For each ORC, participants were presented with an image of the homepage and name of the ORC, then asked if they had ever visited the site to identify instructional strategies or inform practice for students with learning disabilities. As above, there were 84 participants who answered these questions. Table 11 provides a summary of findings for each ORC. For the Alerts Series, a total of 11 respondents indicated they had visited this site. Five respondents indicated they had visited the Best Evidence Encyclopedia. Eight respondents reported visiting each the National Center on Intensive Intervention and the National Technical Assistance Center on Transition. Finally, 12 respondents said they had visited the What Works Clearinghouse. On average, participants visited .52 sites each.

Resources accessed at various online resource centers. Research question 1a asked participants to indicate which resources they had accessed at the five ORCs. For each ORC,

participants were given a list of possible resources to choose from and could select as many as they had used in the past. A summary of the findings for each ORC are presented in Table 12.

Alerts Series. Eleven participants reported having visited the Alerts Series. The most frequently reported resources used by these participants were the Alerts on Fluency Instruction, Graphic Organizers, and Social Skills Instruction, all having been used by six participants (54.5%). Five participants (45.5%) reported having used the Alerts for Vocabulary Instruction, Phonics Instruction, Reading Comprehension Instruction, Direct Instruction, Learning Styles, Cooperative Learning, and Co-Teaching. The Alerts for Collaborative Strategic Reading, Self-Regulated Strategy Development, Functional Behavioral Assessment, Phonological Awareness, Mnemonic Instruction, and Formative Evaluation were each reported as used by four participants (36.4%). The Alert for Peer-Mediated Instruction for Secondary Students was accessed by three participants (27%). Two participants (18.2%) reported having used the Alerts for Explicit Instruction in Math, Self-Determined Learning Model of Instruction, and Cognitive Strategy Instruction. One participant (9.1%) reported having used the Alerts for Content Enhancement Routines, Class-Wide Peer Tutoring, and Reading Recovery. The remaining Alerts were not reported as having been used by any of the participants.

Best Evidence Encyclopedia. Of the 84 participants who provided responses this portion of the questionnaire, 4 (4.8%) reported having visited the BEE. All four (100%) of these participants reported having used the Program Review for Struggling Readers. Two participants (50%) reported having used the Program Review for Beginning Reading. The Program Reviews for Elementary Mathematics, Middle/High School Mathematics, Elementary Reading, Middle/High School Reading, English Language Learners, Effectiveness of Technology

(Reading), and Methodological Features and Effect Sizes were all reportedly used by one participant (25%). The remaining resources were not used by any participants.

National Center on Intensive Intervention. Eight participants (9.5%) reported having visited the NCII. The resource which was most frequently reported by participants as having been used was the Behavioral Progress Monitoring Tools Chart, with seven of the eight participants (87.5%) having accessed this resource. Four participants (50%) reported having used both the Academic Progress Monitoring Tools Chart and the Behavioral Intervention Tools Chart. The Academic Intervention Programs Tools Chart was reported by two participants (25%) as having been used.

National Technical Assistance Center on Transition. Eight participants (9.5%) also reported having visited the NTACT. Six of the eight participants (75%) reported having used the Evidence-Based Practices Reviews. Four participants (50%) reported having used the Promising Practices Reviews. The Research-Based Practices Reviews were reportedly used by three participants (37.5%). One participant reported having used the Unestablished Practices Reviews (12.5%).

What Works Clearinghouse. The greatest number of participants reported having visited the WWC, with a total of 17 (20.2%). Intervention Reports and Single Study Reviews were each reportedly used by six participants (35.3%). Practice Guides were reported as used by five participants (29.4%).

Summary. Teachers in this study did know about and use the five ORCs. Of the 84 participants who completed this portion of the questionnaire, 29 (35.5%) were familiar with at least one of the ORCs. The greatest number of participants reported being familiar with the Alerts Series, however, the greatest number reported having used the What Works

Clearinghouse. In the next section, results on teachers' perceived value of these ORCs will be presented.

Teachers' Perceived Value of Online Resource Centers

Research question two asked participants, "*Do K-12 teachers of students with learning disabilities believe that the five online resource centers in this study are a valuable tool to use in determining practice?*" Following the presentation of each ORC home page and the accompanying resources, participants were asked to rate how useful they found resources at each site to be. Using a 5-point Likert scale, participants selected from Extremely useful, Very useful, Somewhat useful, Not very useful, and Not at all useful with a 1 representing Not at all useful and a 5 representing Extremely useful. Individual usefulness scores for each ORC will be reported above with a summary presented in Table 13.

For the Alerts Series, the average usefulness score was a 3.6. Thus, as a group, those familiar with the Alerts Series found it to be somewhat to very useful. Five of the ten participants rated the Alerts Series as somewhat useful, four rated it as very useful, and one rated it as extremely useful.

The average usefulness score for the BEE was a 3.75, rating this resource as somewhat to very useful. This was the highest usefulness rating of the five ORCs. Of the four participants familiar with the BEE, one rated it as very useful, one as very useful, and two as somewhat useful.

For the NCII, the average usefulness score was a 3.5. As with the Alerts Series and BEE, participants found this resource to be somewhat to very useful. However, for this resource no participants rated it as extremely useful. Of the eight participants who were familiar with the NCII, four found it to be very useful and four found it to be somewhat useful.

Nine participants rated the usefulness of the NTACT earning it an average usefulness score of 3.22, also making this resource somewhat to very useful. One participant rated it as extremely useful, three as very useful, three as somewhat useful, one as not very useful, and one as not at all useful.

A total of 17 participants rated the average usefulness of the WWC as a 2.94, thus making it the least useful of the five sites despite being the most used. Participants rated the WWC as somewhat to not very useful. Three participants rated the WWC as very useful, 11 rated it as somewhat useful, two rated it as not very useful, and one rated it as not at all useful.

Overall, the BEE was found to be the most useful of the five ORCs with an average rating of 3.75. The second most useful ORC was the Alerts Series, followed by the NCII. NTACT was rated as the fourth most useful site, with the WWC being rated as the least useful ORC with an average rating of 2.94. Across all ORCs, the average usefulness score fell between the somewhat and very useful range ($\bar{x} = 3.402$).

Professional Background Effects on Teachers' Knowledge, Use, and Opinions of EBPs

Research question three asked, *“Does a teacher’s level of education, area of certification, number of years teaching, grade levels taught, subject areas taught, primary role, and/or type of students taught impact their level of self-reported knowledge, use, or opinions of online resource centers for EBPs?”* Analysis of data for this research question was conducted using ANOVA and independent samples T-Test to compare group means. The results for this question will be presented in three sections below, beginning with teachers’ self-reported knowledge on ORCs for EBPs, then moving to their use, and finally their opinions of the perceived value of these ORCs. In order to correct for multiple comparisons, the Bonferroni

correction was applied to the results for teachers' opinions of ORCs. Following application of the Bonferroni correction, no statistically significant group differences were found.

Professional background effects on teachers' knowledge of ORCs. Teachers' knowledge of ORCs was measured in Q4, which asked teachers to identify which of the five ORCs they were familiar with when given an image of the homepage. Analysis for this question was conducted primarily using a one-way ANOVA with no Bonferroni correction since teachers' knowledge of ORCs was measured through one variable.

There were no statistically significant between group differences in teachers' knowledge of ORCs as determined by one-way ANOVA found in relation to teachers' level of education ($F(2,81) = .195, p = .823$), level of certification ($F(8,75) = 1.959, p = .063$), number of certifications held ($F(2,74) = .358, p = .700$), years teaching ($F(6,77) = .975, p = .448$), grade taught ($F(3,79) = .093, p = .964$), subject taught ($F(11,71) = 1.171, p = .323$), or type of students ($F(5,77) = .563, p = .748$). There was no statistically significant between group difference as determined by independent samples T-test for primary role ($t(80) = 1.810, p = .074$).

Professional background effects on teachers' use of ORCs. Teachers' use of ORCs was measured in Q7, Q10, Q13, Q16, and Q19 which asked teachers if they had ever visited each of the five ORCs to access resources when given an image of the homepage. Analysis for this question was conducted primarily using a one-way ANOVA with no Bonferroni correction since teachers' use of ORCs was measured through one variable, calculated as the sum of sites visited.

There were no statistically significant between group differences in teachers use of the five ORCs as determined by one-way ANOVA found in relation to teachers' level of education ($F(2,81) = .142, p = .868$), level of certification ($F(8,75) = 1.337, p = .239$), number of certifications held ($F(2,74) = .921, p = .403$), years teaching ($F(6,77) = .549, p = .769$), grade

taught ($F(3,79) = 1.069, p = .367$), subject taught ($F(11,71) = .873, p = .570$), or type of students ($F(5,77) = 1.027, p = .408$). There was no statistically significant between group difference as determined by independent samples T-test for primary role ($t(80) = 1.728, p = .088$).

Professional background effects on teachers' opinions of ORCs. Teachers' opinions of ORCs were measured in Q9, Q12, Q15, Q18, and Q21 which asked teachers who reported using resources at a given ORC to rate the value of those resources using a five point Likert scale. Analysis for this question was conducted primarily using a one-way ANOVA with a Bonferroni correction since teachers' use of ORCs was measured through five variables. After calculating the Bonferroni correction, the altered p-value required to indicate a statistically significant difference was $p = .01$. Results will be reported for each of the five ORCs separately.

Opinions of the Alerts Series. There were no statistically significant between group differences in teachers use of the Alerts Series as determined by one-way ANOVA with Bonferroni correction found in relation to teachers' level of education ($F(2,6) = 1.200, p = .364$), level of certification ($F(5,3) = .300, p = .886$), number of certifications held ($F(2,6) = 3.000, p = .125$), years teaching ($F(5,3) = 1.457, p = .402$), grade taught ($F(3,5) = 2.255, p = .200$), subject taught ($F(6,2) = 1.667, p = .421$), or type of students ($F(3,5) = 2.333, p = .191$). There was no statistically significant between group difference as determined by independent samples T-test for primary role ($t(7) = .298, p = .193$).

Opinions of the BEE. There were no statistically significant between group differences in teachers use of the BEE as determined by one-way ANOVA with Bonferroni correction found in relation to teachers' level of education ($F(1,2) = .750, p = .478$), grade taught ($F(2,1) = 2.250, p = .426$), or type of students ($F(1,2) = .200, p = .698$). Level of certification, number of

certifications held, years teaching, subject taught, and primary role were not analyzed due to insufficient data.

Opinions of the NCII. There were no statistically significant between group differences in teachers use of the NCII as determined by one-way ANOVA with Bonferroni correction found in relation to teachers' level of education ($F(1,6) = 1.000, p = .868$), level of certification ($F(4,3) = 2.250, p = .266$), number of certifications held ($F(1,5) = .714, p = .437$), years teaching ($F(2,4) = .571, p = .605$), grade taught ($F(3,79) = 1.069, p = .367$), subject taught ($F(4,2) = .786, p = .627$), or type of students ($F(3,3) = 1.286, p = .421$). There was no statistically significant between group difference as determined by independent samples T-test for primary role ($t(5) = .205, p = .817$).

Opinions of the NTACT. There were no statistically significant between group differences in teachers use of the NTACT as determined by one-way ANOVA with Bonferroni correction found in relation to teachers' level of education ($F(1,7) = 1.191, p = .311$), level of certification ($F(5,3) = .050, p = .997$), number of certifications held ($F(2,6) = .1125, p = .199$), years teaching ($F(3,5) = .361, p = .785$), grade taught ($F(3,79) = 1.069, p = .367$), subject taught ($F(6,2) = .111, p = .984$), or type of students ($F(2,6) = .193, p = .829$). There was no statistically significant between group difference as determined by independent samples T-test for primary role ($t(7) = .471, p = .257$).

Opinions of the WWC. There were no statistically significant between group differences in teachers use of the WWC as determined by one-way ANOVA with Bonferroni correction found in relation to teachers' level of education ($F(1,15) = 1.765, p = .204$), level of certification ($F(6,10) = .499, p = .796$), number of certifications held ($F(2,14) = 5.905, p = .014$), years teaching ($F(5,11) = .658, p = .663$), grade taught ($F(3,13) = .095, p = .962$), subject taught

($F(6,10) = .389, p = .870$), or type of students ($F(5,11) = 2.474, p = .098$). There was no statistically significant between group difference as determined by independent samples T-test for primary role ($t(14) = -.277, p = .284$).

Summary of professional background effects. None of the professional background measures had a significant impact on teachers' knowledge, use, or opinions of ORCs for students with LD. Though variance was found in levels of knowledge and use, and opinions, statistical significance was not reached for any variable across measures.

Summary of Results

The results described above represent the knowledge, use, and opinions of 84 teachers from one suburban school district. The participants represented teachers with a diverse array of teaching certificates, teaching all grades from kindergarten through seniors in high school. These teachers covered all subject areas with the exception of business and acted in both general education and special education roles. Of these 84 teachers, 29 (34.5%) were familiar with at least one of the five ORCs which were the focus of this study. Teachers were most likely to search online for supports related to behavior and social emotional learning. Teachers were most familiar with the Alerts Series and least familiar with the BEE. The WWC was the most visited ORC, but was also rated as the least useful, while the BEE was the least visited site but was rated as the most useful. There were no significant between group differences found for any of the professional background variables.

Table 10
Participant Background Information

Level of Education	Background Information	Number of Respondents
	Bachelor's Degree	8
	Master's Degree	73
	Doctoral Degree	2
	National Board Certification	1
Certifications Held	Elementary Education	48
	Special Education	27
	Middle School	24
	Secondary	40
	Other	19
Number of Years Teaching	Under 1 year	2
	2-5 years	10
	6-10 years	17
	11-15 years	18
	16-20 years	14
	21-25 years	10
	Over 25 years	13
Grade Levels Taught	Kindergarten	10
	1 st Grade	11
	2 nd Grade	9
	3 rd Grade	12
	4 th Grade	11
	5 th Grade	6
	6 th Grade	6
	7 th Grade	8
	8 th Grade	7
	9 th Grade	37
	10 th Grade	41
	11 th Grade	43
12 th Grade	41	
Subject Areas Taught	English/Language Arts	30
	Math	30
	Social Studies/History	15
	Science	21
	Foreign Language	8
	Art	4
	Music	2
	Health/Physical Education	4
	Business/Technology	0
	Vocational Education	1
	Special Education	21
Other	12	
Primary Responsibility	Special Education Teacher	25
	General Education Teacher	57
Type of Students	Students without disabilities	64
	Students with learning disabilities	77
	Students with disabilities other than learning disabilities	65

Table 11
Participants Visiting Online Resource Centers

Online Resource Center	Number of Participants
Alerts Series	11
Best Evidence Encyclopedia	5
National Center on Intensive Intervention	8
National Technical Assistance Center on Transition	8
What Works Clearinghouse	12

Table 12
Resources Used Each Online Resource Center

Online Resource Center	Number of Participants Reporting Use	Resources
Alerts Series	6	Fluency Instruction, Graphic Organizers, Social Skills Instruction
	5	Vocabulary Instruction, Phonics Instruction, Reading Comprehension Instruction, Direct Instruction, Learning Styles, Cooperative Learning, Co-Teaching
	4	Collaborative Strategic Reading, Self-Regulated Strategy Development, Functional Behavioral Assessment, Phonological Awareness, Mnemonic Instruction, Formative Evaluation
	3	Peer-Mediated Instruction for Secondary Students
	2	Explicit Instruction in Math, Self-Determined Learning Model of Instruction, Cognitive Strategy Instruction
	1	Content Enhancement Routines, Class-Wide Peer Tutoring, Reading Recovery
	0	Strategy Instruction that Primes the Problem Structure, The Alerts Series, High-Stakes Assessment
Best Evidence Encyclopedia	4	Struggling Readers
	2	Beginning Reading
	1	Elementary Mathematics, Middle/High School Mathematics, Elementary Reading, Middle/High School Reading, English Language Learners Reading, Effectiveness of Technology (Reading), Methodological Features and Effect Sizes
	0	Effectiveness of Technology (Mathematics), Upper Elementary Reading, Elementary Science, Secondary Science, Elementary (CSRQ), Middle/High School (CSRQ), K-12 Meta-Analysis (Borman), Education Service Providers (CSRQ), Early Childhood Education
National Center on Intensive Intervention	7	Behavioral Progress Monitoring Tools Chart
	4	Academic Progress Monitoring Tools Chart, Behavioral Intervention Tools Chart
	2	Academic Intervention Programs Tools Chart
National Technical Assistance Center on Transition	6	Evidence-Based Practices Reviews
	4	Promising Practices Reviews
	3	Research-Based Practices Reviews
	1	Unestablished Practices Reviews
What Works Clearinghouse	6	Intervention Reports, Single Study Reviews
	5	Practice Guides

Table 13

Teachers' Perceived Value of the Five Online Resource Centers

Online Resource Center	Average Usefulness Rating (out of 5)
Alerts Series	3.60
Best Evidence Encyclopedia	3.75
National Center on Intensive Intervention	3.50
National Technical Assistance Center on Transition	3.22
What Works Clearinghouse	2.94

Chapter V

Discussion

The purpose of this study was to determine the levels of knowledge and use of ORCs for students with LD held by teachers in one suburban school district in the mid-Atlantic region of the United States, and to measure the teachers' perceived value of these resources. In order to achieve this goal, a non-experimental, qualitative survey design was utilized to address the three primary and one secondary research questions. A 28-item, web-based questionnaire which was designed for the purpose of this study was distributed to all teachers (N = 410) employed by the school district at the time of distribution. Descriptive statistics, one-way analysis of variance, and independent samples t-tests were used to analyze the data collected from the 84 participants who completed the questionnaire. In this chapter, I will present key research findings by question, each presented with a discussion of how these findings can be interpreted within the body of extant literature on EBPs and ORCs. I will then present limitations of the current study, followed by recommendations for teachers and administrators, teacher preparation programs, and future researchers.

Discussion of Key Research Findings

Eighty-four participants completed the questionnaire instrument to determine the knowledge, use, and opinions of ORCs for students with LD held by teachers in CSD. Based on their responses, this study suggests the following:

Teachers' knowledge of online resource centers. Approximately one-third of the participants in this study knew about ORCs. Specifically, 34.5% of participants had heard of at least one of the five ORCs presented in the questionnaire. Among the five ORCs, the Alerts Series was the most widely known, with 22.6% of participants reporting knowledge of this

resource. Following the Alerts Series, the WWC was known by 17.9% of study participants. The NCII was the third most well-known ORC as reported by study participants with 11.9% of participants reporting knowledge of this resource. Fewer than 10% of participants reported knowledge of either the NTACT (9.5%) or the BEE (4.8%). On average across the 84 participants, each knew less than one resource.

Despite the fact that these ORCs are available free of cost and are easily accessible on the web, nearly two-thirds of participants had never heard of any of these sites. As presented in the review of the literature, there is little research which explores teachers' knowledge of ORCs for students with LD. However, the findings of this study are consistent with those of Stormont, Reinke, and Herman (2011) who studied teachers' knowledge of 10 evidence-based interventions for students with emotional and behavioral problems. That study found only one EBP was recognized by a majority of teachers, and that for the remaining nine practices, fewer than 10% of teachers could accurately identify them as evidence-based. The majority of teachers in the current study and in Stormont, Reinke, and Herman's study reported not ever hearing of the resources or practices in question.

Teachers' use of online resource centers. To measure teachers' use of ORCs, the 29 participants who reported knowledge of at least one ORC in the previous section were asked to indicate which resources they had accessed at each of the five sites. The most used ORC was the WWC with 17 participants (20.2%) reporting having used at least one resource at this site. Following the WWC, the next most used site was the Alerts Series with 11 (13.1%) participants reporting having used at least one resource. Both the NCII and NTACT were reportedly used by eight participants (9.5%), with the BEE being the least used site with only four participants (4.8%) reporting use of its resources.

Very few of the participants in this study reported having used any of the ORCs to access instructional information for students with LD. Even the most used site, the WWC was used by only 20.2% of study participants. The WWC is backed and funded by the Institute of Education Sciences within the U.S. Department of Education. On their website, the WWC claims that, “for more than a decade, the WWC has been a central and trusted source of scientific evidence on education programs, products, practices, and policies.” If only 20% of teachers are using this site, this begs the question of who has it been a central and trusted source for. In fact, the WWC is not the only site in this study which receives funding or backing from the U.S. Department of Education. The BEE, NCII, and NTACTION also receive funding from the U.S. Department of Education, and the Alerts Series is funded through one of the preeminent research organizations in special education. Despite all this funding, little research has been conducted to identify how, or even if, teachers are making use of the resources available at these sites.

The literature on teachers’ use of EBPs and RBPs falls short of exploring the sources teachers use to identify these practices, and instead explores teachers’ implementation of such practices only. In one study, special education teachers and school psychologists were asked to report their use of various practices (Burns & Ysseldyke, 2009). Results indicated that nearly 90% of respondents indicated having used or observing use of direct instruction, a known EBP, at least once a week. However, participants of this study were not able to accurately determine whether listed practices were, in fact, EBPs. This study did not investigate where teachers accessed information about the practices under study.

Teachers’ perceived value of online resource centers. Teachers who had used any of the five ORCs were asked to rate the usefulness of its resources using a 5-point Likert scale. The Alerts Series, BEE, NCII, and NTACTION all earned an average usefulness rating which placed

them in the somewhat to very useful range. The most useful site as rated by participants was the BEE, with an average score of 3.75, despite having been the least used site. As the most visited site, the WWC was rated as the least useful, with an average score of just 2.94. This was the only site that earned a rating of somewhat to not very useful. It is interesting to note that, to an extent, as use increased, usefulness decreased. The exception to this observation was the NTACTION. It is possible that the more specialized resources at this site (i.e. those related to postsecondary transition and disabilities other than LD) had an impact on the perceived value held by its users. Overall, participants did rate the majority of sites to be somewhat to very useful, however, none exceeded a very useful rating, and the most used site was rated as being less than somewhat useful.

In the literature, several studies explored teachers' perceptions of research. In a 2005 study, Boardman, Arguelles, Vaughn, Hughes, and Klingner, found that there is a general skepticism among educators, specifically special educators, about the validity of research. These findings were supported by Jones (2009) who found that just four in 10 teachers could be defined as "definitive supporters" of research, while three in 10 were found to be critics. With this pervasive and well-studied distrust for educational research, it is no wonder more teachers were not found to have used the ORCs in this study.

Professional background effects on teachers' knowledge of online resource centers.

There were no statistically significant between group differences in teachers' knowledge of ORCs. However, in conducting non-statistical analysis of the data, a few notable trends appear. Among participants who reported knowing any ORCs, all but two held a Master's Degree or higher. Additionally, none were brand new teachers having taught for a year or less, and only two had been teaching for fewer than five years. While all participants who reported knowing at

least one ORC taught students with disabilities, all but one taught students with disabilities other than LD in addition to students with LD. Thus, in general, teachers with knowledge of ORCs hold higher level degrees, have been teaching longer, and teach a more diverse student population than those without knowledge of these ORCs.

Professional background effects on teachers' use of online resource centers. No statistically significant between group differences in teachers' use of the five ORCs were reported. Again, through observational analysis, some notable findings arise. All four teachers reporting use of ten or more resources hold Master's Degrees and have been teaching for more than five years. Of the two participants reporting the highest level of use, one was a special education teacher while the other was a general education teacher. These results indicate that teachers with higher degrees and those who have been teaching longer may be more likely to make use of ORCs.

Professional background effects on teachers' perceived value of online resource centers. There were no statistically significant between group differences in teachers' perceived value of the five ORCs. However, observational analysis again reveals some interesting findings. One participant did rate the one site s/he had visited as extremely useful. This participant had visited the Alerts Series and accessed two resources. Another participant who had visited four sites, excluding NTACTION, gave an average usefulness rating across both sites of 4.25 (in the very to extremely useful range). Six additional participants gave an average rating of four across all sites they had used. All eight of these participants hold Master's Degrees and have been teaching for a minimum of six years. These results indicate that holding higher level degrees or having more teaching experience may lead one to value educational research at a higher level than those with less education and experience.

Summary of Key Findings

Although there were no statistically significant findings reported as a result of this study, there were several observational findings which warrant further discussion. Of primary importance is the low number of overall participants who reported any level of knowledge or use across any of the five ORCs. With just 34.5% of participants having reported knowledge of at least one ORC and only 20.2% reporting any level of use of the ORCs in this study, it is evident that the vast majority of teachers are unaware of, and therefore unable to make use of the resources available at these ORCs. Further, over 84% of teachers reported seeking resources for behavioral supports, and nearly 55% reported seeking resources for academic supports, making clear the need that teachers have to identify appropriate resources to support and improve their instruction. The discrepancy between the number of teachers who need resources and those who are making use of the resources available to them is alarming, and clearly validates the research-to-practice gap described in Chapter 2 (Cook et al., 2012).

Statistical analysis failed to find any differences between groups of respondents based upon to professional background categories measured in this study. However, participants reporting higher levels of knowledge and use, and those giving higher ratings of usefulness to the ORCs did tend to hold higher degrees, have more experience teaching, and teach a greater portion of students with disabilities than those reported lower levels of knowledge and use, and those finding the resources to be of less value. While not statistically significant, these differences may shed light on why many teachers are skeptical over education research. Perhaps by seeking further education, teachers are exposed to more education research, and learn the skills necessary to conduct and evaluate research themselves, thus increasing their knowledge of and trust of such resources. Also, as teachers gain experience and face recurrent challenges in

the classroom which are not being addressed by the resources provided by their schools, teachers may begin to seek outside information and be forced to turn to research when more traditional routes have failed them.

Limitations

As with all research, this dissertation has several limitations that are important to note and understand. Three such limitations are of particular relevance to this study: (1) potential bias and influence of the researcher, (2) size and nature of the sample, and (3) use of a non-validated questionnaire.

As mentioned in chapter 3, I am employed full-time by CSD and serve in a role as a teacher leader within the district. Thus, it is possible that my role could have influenced participants' responses or biased results. In all communications with potential respondents, my role as a non-evaluative colleague was emphasized in order to reduce the possibility of such bias. Throughout the study, I did not discuss data collection with any potential respondents except to thank them for their participation when explicitly addressed by participants reporting they had completed the questionnaire.

The size and nature of the sample also present limitations to the generalizability of research findings. The population for the study was small, with only 410 potential participants. These participants represent the full teaching staff of just one school district, and therefore, findings cannot be generalized outside of this district. Of these 410 teachers, just 20.49% completed the questionnaire, a much lower response rate than had been the target. Unfortunately, this response rate is low, even compared to standards set forth by Fowler, 2009 for web-based questionnaires of 30 to 60%. The low response rate further limits the ability to generalize findings even to the district population of teachers.

Finally, the questionnaire used in this study was created for this study and did not undergo validation prior to its use. Therefore, the validity of data collected cannot be known. In order to improve validity of the questionnaire, pilot testing was conducted with a purposely selected focus group as described in Chapter 3.

Implications for Practice and Future Research

The results of this study have brought to light several recommendations for the teachers and administrators of CSD and for teacher preparation programs, as well as for future research and the organizations which curate and make pre-appraised evidence available via ORCs. Of primary importance is the need to begin to take steps at all levels to close the research-to-practice gap which has been clearly confirmed in this study. The discrepancy between teachers' self-reported need for resources and their knowledge and use of the resources which are readily available online is difficult to justify. When you add to this fact that teachers only viewed the majority of sites to be somewhat useful, and given the large amounts of money invested in such resources, there needs to be a concerted effort at all levels to connect teachers to these resources in a meaningful way.

Recommendations for teachers. Now that many of the teachers in CSD have been exposed to the existence of ORCs, it would be beneficial for them to begin to explore the resources available at these sites. Participants should familiarize themselves with the resources available at these and other ORCs which most closely suit their professional needs. Through Professional Learning Communities (PLCs) and departmental or grade level collaboration, teachers can establish procedures for identifying and sharing relevant research findings and implementing them with colleagues for whom similar challenges present. Giving teachers the opportunity to actively participate and collaborate through PLCs has been shown through

research to be a critical component of high-quality professional development (Van Driel & Berry, 2012). This approach also aligns to the principles of adult learning described by Terehoff (2002) which suggest that professional development should appeal to an adult learner's sense of personal freedom to learn, choice of learning, and the relevance of experiences during learning. Colleagues who find they are unfamiliar or lacking confidence in working with research should seek further education either through additional professional development opportunities or through formal academic pursuits.

Recommendations for administration. The administration of CSD should implement systematic professional development to increase teachers' knowledge and use of EBPs, including their knowledge and use of these and other ORCs. High-quality professional development should adhere to eight core features as defined by Patton, Parker, and Tannehill (2015). These eight features outline that professional development should be based on teachers' needs and interests, acknowledge that learning is a social process, include collaborative opportunities within learning communities of educators, be ongoing and sustained, treat teachers as active learners, enhance teachers' pedagogical skills and content knowledge, be facilitated with care, and focus on improving learning outcomes for students. Professional development aimed at improving teachers' knowledge and use of ORCs and the practices described at these sites can, and must, address all of these core components. As a starting point, professional development should provide staff with an information session pertaining to the availability of online resources, how and where to access them, and how to implement them with fidelity. Teachers should then be given an opportunity to apply these resources and meet in content or grade level teams to discuss the application of the information they have found. Throughout the year, teachers should be provided with continued opportunities to explore available resources, receive ongoing support

and feedback on implementation of various EBPs, and collaborate with colleagues to facilitate improved practice. As a district, instructional practices should be selected from among those with EBP and RBP status whenever possible. The district should provide the research backing the practices in use to their staff so that a common understanding of research and its value can be gained. Training for teachers on how to access and assess educational research should also be provided for teachers unfamiliar with this process. For those teachers who are less familiar with interpreting research on their own, research can be presented through abstracts and/or annotated bibliographies to allow those who wish to read further the opportunity to do so.

Recommendations for teacher preparation programs. The results of this study made it clear that current teacher preparation programs are not doing an adequate job of exposing new teachers to the vast wealth of resources available to them. Even brand-new teachers did not seem to know about these ORCs. Therefore, teacher preparation programs must begin to put a greater focus on research and the use of digital resources. All students in teacher preparation programs should have a course which introduces students to educational research, how to interpret it, and how to apply its findings to practice. This alone has the potential to begin closing the research-to-practice gap by making teachers more comfortable reading and applying research in the classroom. Additionally, teacher preparation programs should include coursework on the importance of evidence-based instruction, especially for those teachers working with students with disabilities or behavioral concerns.

Recommendations for future research. This study just begins to scratch the surface of what teachers know about ORCs and EBPs. Given the large funds provided to these ORCs, it is critically important to uncover whether the findings of this study are consistent with what

teachers across the nation know about ORCs, and how they make use of their resources. Future research should aim to explore the knowledge and use of a more diverse and nationally representative sample of teachers. Research organizations should begin to explore ways to better publicize the resources which they make available online. Whether through webinars, professional development engagements, or at professional conferences, these organizations need to get the word out to teachers so that their resources can begin to impact instruction at the classroom level. Additionally, it would be of value in future studies to ask respondents if their teacher preparation programs did teach them about EBPs or provide them knowledge of these or other resources in order to better evaluate the reasons behind different teachers' levels of knowledge and use.

Conclusion

In summary, this study aimed to describe teachers' knowledge, use, and opinions of five ORCs for EBPs for students with LD. As a teacher for over a decade, I have seen the need to improve instruction for our students most in need. As a researcher, I have come to understand the vast resources available which go widely unused by my colleagues to address the issues we see among our students. While this study serves to confirm that these resources are, in fact, mostly unused by those in CSD, I hope it will be the impetus needed to drive the district towards a more research-oriented instructional focus. On a grander scale, I hope this study will serve as a first step in identifying the disconnect that exists between ORCs and teachers which only furthers the research-to-practice gap rather than closing it. This study is a significant addition to the literature on the research-to-practice gap, online resources, and EBPs as it has shown that despite the legal mandates backing research in the classroom and extensive efforts made to generate research clearinghouses for practitioners, these resources remain untouched by a majority of

teachers in the classroom. It is my hope that the results of this study will be used to improve practice within my district and among other similar schools, such that the students most in need of the highest quality instruction will receive that which has the greatest chance of improving their outcomes.

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Appendix A

Questionnaire Instrument

Teacher Knowledge, Use, and Opinions of Online Resource Centers for Evidence-Based Practices for Students with Learning Disabilities

Q1 Thank you for your interest in completing this questionnaire on Teacher Knowledge, Use, and Opinions of Online Resource Centers for Evidence-Based Practices for Students with Learning Disabilities. This questionnaire is being conducted as part of a dissertation research study through Arcadia University by Meredith Gapsis. All teachers who are currently employed by CSD and currently working with students with LD are invited to participate in this questionnaire. If you elect to participate in this research study, your responses to the survey questions will remain confidential and no identifying information will be collected with your responses. Your email address will not be attached to your response. Meredith Gapsis is an employee of CSD. She holds no evaluative responsibilities, and your participation in this study will in no way impact your employment. If you agree to participate in this study, please answer all questions to the best of your ability and as honestly as possible. Your honest responses will help improve instructional practice. You may elect to skip certain questions if you are unable to provide a response. You may also end your participation at any time during completion of the questionnaire by simply closing your web browser. If you end your participation prior to completion of the questionnaire, your answers will be discarded. Once you submit the questionnaire, your responses will be used in data analysis. The instrument contains 26 items and will take you approximately 15 minutes to complete. In addition to questions about your knowledge, use, and opinions of online resources centers, you will also be asked questions about your professional background which will be used for the purpose of comparison. You are eligible to participate in this study if you meet the following requirements: 1. You are a certified teacher in grades K-12 currently employed by Carterville School District, and 2. You currently teach at least one student with a Learning Disability in any capacity. By selecting "I agree to participate" below you give your consent as a participant in this research study and confirm that you meet the two eligibility requirements listed above. Thank you for your participation.

- I agree to participate.
- I do not agree to participate.

Condition: I do not agree to participate. Is Selected. Skip To: End of Survey.

Q2 Where do you search for resources and ideas to support your instructional decision making for students with learning disabilities? Please check all that apply.

- Academic Journals (eg. Teaching Exceptional Children, Learning Disability Quarterly, etc.)
- Professional Development Materials
- Textbooks
- Websites (excluding online journals - please list websites) _____
- Professional Conferences
- Recommendations from Colleagues
- Instructional Coach or Specialist
- Recommendations from a Supervisor or Administrator
- Other (please specify) _____

Display This Question:

If Thank you for your interest in completing this questionnaire on Teacher Knowledge, Use, and Opinions of Online Resource Centers for Evidence-Based Practices for Students with Learning Disabilities.... I agree to participate. Is Selected

Q3 How often do you use research to support your instructional decision making for students with learning disabilities?

- Always
- Frequently
- Sometimes
- Rarely
- Never

Condition: Never Is Selected. Skip To: End of Block.

Q4 How effective is your current use of research in supporting instructional decision making for students with learning disabilities?

- Extremely effective
- Very effective
- Somewhat effective
- Not very effective
- Not effective at all

Q5 An online resource center is a web-based source of education research that has undergone systematic review. Have you heard of any of the online resource centers listed below? Please check all that apply.

- Alerts Series - Council for Exceptional Children
- Best Evidence Encyclopedia
- National Center on Intensive Intervention
- National Technical Assistance Center on Transition
- What Works Clearinghouse
- None of the Above
- Other (please specify) _____

Q6 What type(s) of classroom issues or concerns for students with learning disabilities would lead you to seek information at an online resource center? Please check all that apply.

- Reading/English/Language Arts
- STEM (Science, Technology, Engineering, Mathematics)
- Behavior
- Social Emotional Learning
- Executive Functioning/Organization/Study Skills
- Assistive Technology
- Other (Please specify) _____

Q7 Pictured is the home page of the Alerts Series. Have you ever visited this online resource center to identify instructional strategies or inform your practice for working with students with learning disabilities?

- Yes
- No

Condition: No Is Selected. Skip To: End of Block.

Q8 Which of the following Alerts have you used to inform your practice for working with students with learning disabilities? Please select all that apply.

- Collaborative Strategic Reading
- Peer-mediated Instruction for Secondary Students
- Content Enhancement Routines
- Explicit Instruction in Math
- Strategy Instruction That Primes the Problem Structure
- Self-determined Learning Model of Instruction
- Cognitive Strategy Instruction
- Vocabulary Instruction
- Self-Regulated Strategy Development
- Functional Behavioral Assessment
- Fluency Instruction
- Phonics Instruction
- Graphic Organizers
- Reading Comprehension Instruction
- Phonological Awareness
- Class-wide Peer Tutoring
- Mnemonic Instruction
- Formative Evaluation
- Direct Instruction
- The Alert Series
- Learning Styles
- Cooperative Learning
- Social Skills Instruction
- Reading Recovery
- Co-Teaching
- High-Stakes Assessment
- None of the Above
- Other (please specify) _____

Q9 How useful were the resources at the Alerts Series to inform your practice?

- Extremely useful
- Very useful
- Somewhat useful
- Not very useful
- Not at all useful

Q10 Pictured is the home page of the Best Evidence Encyclopedia. Have you ever visited this online resource center to identify instructional strategies or inform your practice for working with students with learning disabilities?

- Yes
- No

Condition: No Is Selected. Skip To: End of Block.

Q11 Which of the following Program Reviews from the Best Evidence Encyclopedia have you used to inform your practice for working with students with learning disabilities? Please select all that apply.

- Elementary Mathematics
- Middle/High School Mathematics
- Effectiveness of Technology (Mathematics)
- Beginning Reading
- Upper Elementary Reading
- Elementary Reading
- Middle/High School Reading
- English Language Learners Reading
- Struggling Readers
- Effectiveness of Technology (Reading)
- Elementary Science
- Secondary Science
- Elementary (CSRQ)
- Middle/High School (CSRQ)
- K-12 Meta-Analysis (Borman)
- Education Service Providers (CSRQ)
- Early Childhood Education
- Methodological Features and Effect Sizes
- None of the above
- Other (please specify) _____

Q12 How useful were the resources at the Best Evidence Encyclopedia to inform your practice?

- Extremely useful
- Very useful
- Somewhat useful
- Not very useful
- Not at all useful

Q13 Pictured is the home page of the National Center on Intensive Intervention. Have you ever visited this online resource center to identify instructional strategies or inform your practice for working with students with learning disabilities?

- Yes
- No

Condition: No Is Selected. Skip To: End of Block.

Q14 Which of the following resources from the National Center on Intensive Intervention have you used to inform your practice for working with students with learning disabilities? Please select all that apply.

- Academic Progress Monitoring Tools Chart
- Behavioral Progress Monitoring Tools Chart
- Academic Intervention Programs Tools Chart
- Behavioral Intervention Tools Chart
- None of the above
- Other (please specify) _____

Q15 How useful were the resources at the National Center on Intensive Intervention to inform your practice?

- Extremely useful
- Very useful
- Somewhat useful
- Not very useful
- Not at all useful

Q16 Pictured is the home page of the National Technical Assistance Center on Transition. Have you ever visited this online resource center to identify instructional strategies or inform your practice for working with students with learning disabilities?

- Yes
- No

Condition: No Is Selected. Skip To: End of Block.

Q17 Which of the following resources from the National Technical Assistance Center on Transition have you used to inform your practice for working with students with learning disabilities? Please select all that apply.

- Evidence-Based Practices Reviews
- Research-Based Practices Reviews
- Promising Practices Reviews
- Unestablished Practices Reviews
- None of the above
- Other (please specify) _____

Q18 How useful were the resources at the National Technical Assistance Center on Transition to inform your practice?

- Extremely useful
- Very useful
- Somewhat useful
- Not very useful
- Not at all useful

Q19 Pictured is the home page of the What Works Clearinghouse. Have you ever visited this online resource center to identify instructional strategies or inform your practice for working with students with learning disabilities?

- Yes
- No
- Unsure

Condition: No Is Selected. Skip To: End of Block.

Q20 Which of the following resources from the What Works Clearinghouse have you used to inform your practice for working with students with learning disabilities? Please select all that apply.

- Practice Guides
- Intervention Reports
- Single Study Reviews
- None of the above
- Other (please specify) _____

Q21 How useful were the resources at the What Works Clearinghouse to inform your practice?

- Extremely useful
- Very useful
- Somewhat useful
- Not very useful
- Not at all useful

Q22 What is the highest level of education you have completed?

- Bachelor's Degree
- Master's Degree
- Doctoral Degree
- National Board Certification

Q23 What teaching certifications do you hold? Check all that apply. Please list content area.

- Elementary Education
- Special Education
- Middle School (please specify) _____
- Secondary (please specify) _____
- Other (please specify) _____

Q24 For how many years have you been teaching?

- Under 1 year
- 2-5 years
- 6-10 years
- 11-15 years
- 16-20 years
- 21-25 years
- Over 25 years

Q25 What grade level(s) do you currently teach? Check all that apply.

- Kindergarten
- 1st grade
- 2nd grade
- 3rd grade
- 4th grade
- 5th grade
- 6th grade
- 7th grade
- 8th grade
- 9th grade
- 10th grade
- 11th grade
- 12th grade

Q26 What subject area(s) do you currently teach? Check all that apply.

- English/Language Arts
- Math
- Social Studies/History
- Science
- Foreign Language
- Art
- Music
- Health/Physical Education
- Business/Technology
- Vocational Education
- Special Education
- Other (please specify) _____

Q27 How do you primarily describe yourself?

- Special Education Teacher
- General Education Teacher

Q28 What type(s) of students do you currently teach? Check all that apply.

- Students without disabilities.
- Students with learning disabilities.
- Students with disabilities other than learning disabilities.

Q29 Thank you for your participation in this questionnaire. If you have questions about this research or would like to obtain a copy of the results of this study, when complete, please send an email request to mgapsis@arcadia.edu with the subject line, "Online Resource Centers Study Results Request," and I will be happy to share my findings with you.

Appendix B

Email Contacts

First Contact

Dear CSD Colleague,

I am writing to ask for your help with my dissertation research. As a teacher in CSD, I am interested in finding ways to improve student outcomes. To that end, I am asking all teachers in the district to complete a brief questionnaire entitled “Teacher Knowledge, Use, and Opinions of Online Resource Centers for Evidence-Based Practices for Students with Learning Disabilities” about your use of several online resources related to instructional practices for students with learning disabilities. The goal of this survey is to measure how familiar teachers are with the resources available to them via these online resource centers, and whether such resources are being used to guide instruction.

The questionnaire is short, just 26 questions, and should take you only about 15 minutes to complete. To begin, simply click this link:

INSERT QUESTIONNAIRE LINK HERE

This questionnaire is confidential. Neither your name or email address will be submitted with your response. Your participation is voluntary and you can terminate your participation at any time and your answers will be deleted. Should you have any question or comments, please contact Meredith Gapsis at mgapsis@arcadia.edu.

Your time and participation are greatly appreciated.

Many Thanks,

Meredith Gapsis
Doctoral Student Researcher
Arcadia University

Student Achievement Lead Teacher
Carterville High School

Second Contact

Dear CSD Colleague,

Last week I sent you an email inviting you to participate in my dissertation research by completing a questionnaire entitled “Teacher Knowledge, Use, and Opinions of Online Resource Centers for Evidence-Based Practices for Students with Learning Disabilities.” If you have already submitted a response, I thank you for your participation.

If you still wish to respond, please click the link provided below to submit your response:

INSERT QUESTIONNAIRE LINK HERE

Your participation in this study is voluntary, and I thank you for considering this request.

Sincerely,

Meredith Gapsis
Doctoral Student Researcher
Arcadia University

Student Achievement Lead Teacher
Carterville High School

Third Contact

Dear CSD Colleague,

You recently received an email asking you to complete the questionnaire entitled “Teacher Knowledge, Use, and Opinions of Online Resource Centers for Evidence-Based Practices for Students with Learning Disabilities” as a part of my dissertation research. If you have already completed the questionnaire, I would like to thank you very much. I greatly appreciate your help.

If you have not yet completed the questionnaire, I would like to ask one final time for you to consider submitting your response. The questionnaire should only take you about 15 minutes to complete and your participation could help to bring about improved instruction for the students of CSD. Simply click on the link below to begin answering the questions.

INSERT QUESTIONNAIRE LINK HERE

Again, I thank you for your time and participation.

Sincerely,

Meredith Gapsis
Doctoral Student Researcher
Arcadia University

Student Achievement Lead Teacher
Carterville High School