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Response to Intervention 2 EasyCBM and AIMSweb Intervention Programs How They Relate to Student Growth

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Response to Intervention^2 EasyCBM and AIMSweb Intervention Programs: How They Relate to Student Growth

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by

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ABSTRACT

Response to Intervention^2 EasyCBM and AIMSweb Intervention Programs: How They Relate to Student Growth

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This researcher aimed to determine how data collected from computer-based assessment programs, specifically EasyCBM and AIMSweb, was used in data-driven instruction and used to identify risk levels in math and reading areas proficiency. Data from intervention programs were collected from six participating high schools. The data collection included math and reading universal screening scores and levels of risk indicators from Tier 2 and Tier 3 levels of their response to intervention (RTI) programs. Section A included math data within a baseline score and a risk indicator level. Section B had reading scores with a baseline score and a risk indicator level.

A descriptive quantitative study was conducted to determine if significant differences in EasyCBM and AIMSweb exist in student universal screener scores over an academic calendar year. Independent variables included: math and reading universal screener scores, tier level identifiers, and level of risk indicators. Factors that influenced the rates of effectiveness included: interventionist utilization of data, student entry tier levels, and time spent in intervention from the fall to winter benchmarking period.

The study's findings indicated a significant difference in universal screener scores between EasyCBM and AIMSweb when analyzed over the same period from school to school. Additional analysis was utilized to reveal substantial differences between Tier 2 in reading and math risk indicators and Tier 3 in reading and math risk indicators. Student participation in the program did indicate a significant difference when applied longer than one-half a calendar year. Results showed that students displayed higher improvement rates through continued application of both programs throughout the fall and winter (August 2018 to February 2019).

DEDICATION

This dissertation is dedicated to my wife and two daughters. Lexie you have been a source of encouragement and inspiration. Your support has been unwavering throughout this endeavor. You are the reason I want to continue to be better every day. From the beginnings of our relationship, you challenged me to push myself further and farther than I could have ever dreamed possible. Thank you for accompanying me every step of my journey.

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Chapter 1. Introduction

The Tennessee Department of Education has mandated school systems in Tennessee to adopt an Intervention program. The RTI^2 framework is critical to supporting children in becoming ready students (Tennessee Department of Education, 2016). Policymakers have high expectations that Response to Intervention (RTI) (a) will encourage and guide practitioners to intervene earlier on behalf of a greater number of children at risk for school failure, and (b) will represent a more valid method of learning disabled (LD) identification because early intervention will decrease the number of false positives, or students given a disability label who are low achievers because of poor instruction rather than an inherent disability (Fuchs & Fuchs, 2005).

The purpose of this quantitative study is to determine whether there are significant differences in the levels of efficacy of EasyCBM and AIMSweb on student performance derived from students' universal screener scores and level of risk identifiers during the fall and winter of a school calendar year. Universal screeners' scores and levels of risk scores will be collected and examined to determine significant differences in how the programs assess student need through intervention. Computer-based measurement tools assess student achievement and placement in intervention courses. Once assessments have taken place in universal screening, data collected is used to place students by percentage into an intervention group (Tennessee Department of Education, 2016).

The three different student performance data levels are grouped by percentage into Tiers. Tier 1 involves the top 80% of students, and general classroom instruction occurs for all students. The second, or tier 2, involves the bottom 10% to 20% of students identified as performing below proficient levels. Students in Tier 2 are put into groups of 10 or less and receive more intense instruction. The bottom 10% of students are identified and performing well

below proficient and are identified using Tier 3. Tier thre3e students are grouped six or less and receive the most intensive intervention. Tier level identification is also proportional to the intensity of which intervention occurs. Data is collected by the interventionists and used to track student proficiency progress and make data-based decisions for intervention (Tennessee Department of Education, 2016). EasyCBM and AIMSweb are the two computer-based program tools for intervention this study will examine.

Statement of the Problem

Ridgeway et al. (2012) found that most studies that examined the impact of RTI on academic achievement resulted in some level of notable improvement, thereby suggesting that a multi-tiered intervention approach can mitigate the risk of student failures. On July 1, 2016, the Tennessee State Department of Education mandated that all secondary schools have a research-based intervention program for grades 9-12 (Tennessee Department of Education, 2016). Training for the implementation of RTI has been provided by the state department of education core offices for school intervention program leaders and interventionists. Intervention programs are available both commercially and as open source. The Tennessee State Department of Education recommends two programs for intervention. Both programs have similar features and display composite data compiled through benchmark tests. Discrepancies in data embedded in student achievement reports between EasyCBM and AIMSweb lend to difficulties in needs identification and appropriate instructional placement when students transition from one school district to another. EasyCBM and AIMSweb have embedded universal screening measures compiled using knowledge-based skills assessments and state-standard knowledge assessments ranging from grades kindergarten through eighth grade focusing on reading and math. Both

programs have tools to help interventionists identify English Language Learner (ELL) skill deficits in students and have tools that help teachers identify special needs characteristics of dyslexia in student work. The RTI manual has guidelines requiring that national norms be used as comparative samples in both programs and are updated frequently to help display informative math and reading fluency comparisons (Tennessee Department of Education, 2016). For fidelity and reliability in intervention application, comparison normed scores with the state and local district levels are also available. Administrators can measure the application consistency of programs through fidelity monitoring and, in turn, can offer suggestions for improving instruction.

Research Questions

The following research questions were developed to examine the performance data and identify any significant differences derived from the application of EasyCBM or AIMSweb under the framework of RTI.

1. For Tier 2 students, is there a significant difference in Universal Screener Proficiency scores between students enrolled in EasyCBM and students enrolled in AIMSweb scores?
2. For Tier 3 students, is there a significant difference in Universal Screener Proficiency scores between students enrolled in EasyCBM and students enrolled in AIMSweb scores?
3. For Tier 2 students, is there a significant difference in the number of students who transition between Tier 2 and Tier 1 instruction enrolled in EasyCBM and students enrolled in AIMSweb?
4. For Tier 3 students, is there a significant difference in the number of students who transition between Tier 3 and Tier 2 instruction enrolled in EasyCBM and students enrolled in AIMSweb?

5. For Tier 2 students, is there a significant difference in the level of risk indicators (low, some, high) between students receiving intervention in EasyCBM and students receiving intervention in AIMSweb?
6. For Tier 3 students, is there a significant difference in the level of risk indicators (low, some, high) between students receiving intervention in EasyCBM and students receiving intervention in AIMSweb?

Significance of the Study

Response to intervention provides a method of data-driven instruction used with students identified as at-risk academically. With multiple programs used in Tennessee for intervention, this study examined the most effective means of providing intervention through universal screening and progress monitoring. Teachers, interventionists, and administrators may use these findings to help drive the modification of their delivery and monitoring frameworks under the auspices of RTI.

Developing an understanding of how these two intervention programs measure student achievement and academic risk levels may help districts more accurately provide support for students in need. Information about intervention programs may also help students transition from one school district to another. Benefits from understanding how the data aligns from one program to another could help prevent lost educational opportunities, in turn mitigating misidentification of student needs, resulting in tailoring the educational program to the student. Lewis et al. (2007) found it was important when selecting intervention programs that (a) educators should consider the extent of the evidence-based intervention effectiveness and (b) the program fits with the school or district context.

The state department of education lists three intervention programs: EasyCBM, AIMSweb, and Dibels that may be used for RTI^2. Only EasyCBM and AIMSweb are recommended for use with intervention programs. With only two recommended programs for RTI^2, it will be difficult to predict the effectiveness levels of Response to Intervention practices due to schools applying intervention inconsistently. Some schools utilize other applications in conjunction with EasyCBM and AIMSweb, using one universal screening program and the other progress monitoring program. Some intervention programs can be used in conjunction with EasyCBM and AIMSweb. Both EasyCBM and AIMSweb provide data as a starting point for intervention. Neither program offers prescribed interventions for the student; however, the programs provide information to allow the interventionist to develop data-based decisions on addressing specific areas of student need. For this research, universal screening benchmark data and identified risk indicators from EasyCBM and AIMSweb will serve as the primary source for student performance data. District level administrators and intervention supervisors may use this study to help determine which program, either EasyCBM or AIMSweb may be best for their RTI^2 program.

There is limited information on the direct study of EasyCBM and AIMSweb efficacy levels in Tennessee. This study intends to examine the effectiveness of EasyCBM and AIMSweb on student achievement under the RTI^2 framework. Taking student achievement into consideration can allow school districts to decide which application they want to use for intervention. Further intentions are to make recommendations for best practices based on this study's findings and offer support for school districts looking for more information about these programs.

Definitions of Terminology

The following is a list of common terminology and keywords used when discussing Response to intervention.

AIMSweb - A benchmark and progress monitoring system based on direct, frequent, and continuous student assessment using brief, accurate measures of reading, math, spelling, and writing. AIMSweb is the most comprehensive K-12 assessment system that supports Response to Intervention (RTI) and tiered instruction (CDE, 2020).

Computer-Based Management (CBM) –A standardized measure that samples from a year's worth of curriculum to assess the degree to which students have mastered the skills and knowledge deemed critical at age level (Smith, 2015).

EasyCBM - An online system that provides reading and math benchmark and progress monitoring assessments and reports for district, school, and teacher use. Researchers at the University of Oregon designed it as an integral part of an RTI (Response to Intervention) model. (EasyCBM.com, 2021).

Fidelity Monitoring **-** The systematic monitoring by a responsible instructional leader (e.g., principal, assistant principal, district supervisor) to determine the extent to which delivery of core instruction adheres to the expectation and goals set for student learning (Tennessee Department of Education, 2016).

Level of Risk Indicators -

Low risk: At or above benchmark in core (reading or math) program,

Some risk: Below benchmark in core (reading or math) program,

High risk: Unsuccessful in core (reading or math) programs. (ReadNaturally, 2021).

Multi-Tiered System of Support (MTSS) - A comprehensive framework used to provide targeted support for all learners. It is rooted in supporting the whole child, whether an advanced or struggling learner, through academic, behavioral, social, and emotional services. King, 2018.

NWEA Measure of Academic Progress (MAP) Assessment - A computerized adaptive test which helps teachers, parents, and administrators improve learning for all students and make informed decisions to promote a child's academic growth. (Fleming, 2017).

Response to Intervention (RTI) - A multi-tier approach to identifying and supporting students with learning and behavior needs. (RTI Action Network, 2020).

Response to Intervention 2 (RTI^2) - A term used to describe a revamping of Response to Intervention includes instruction by the Tennessee State Department of Education. Now referred to as Response to Intervention and Instruction (Tennessee Department of Education, 2016).

Universal Screening **-** A schoolwide screening process that uses multiple sources of data to identify individual student strengths and areas of need and provides districts/schools with accurate information for making informed decisions about skills-specific interventions, reteaching/remediation, and enrichment for each child. (Tennessee Department of Education, 2016)

Limitations and Delimitations

This descriptive quantitative study was conducted in six different high schools in the Upper East Tennessee Region. Data points were gathered from the 2018 through 2019 school year and reflected induction into intervention, identified through universal screening in the fall

and then again in the winter. One limitation of the study was that due to sampling only schools that use either EasyCBM or AIMSweb, results may not be generalizable to schools using other intervention programs either coupled with AIMSweb EasyCBM. A second limitation was gathering data from schools that currently use EasyCBM and two high schools' limited sample size. With a smaller number of data points from EasyCBM, it may not be an accurate representation of how students are identified by risk level and universal screener score. A third limitation was the sampling demographic representing county schools in a predominantly rural setting. Without representing urban schools from the same region in the sampling, it may not be easy to generalize the findings for students enrolled in EasyCBM and AIMSweb.

Initially, this study confined itself to collecting data from schools that use only EasyCBM or AIMSweb for their intervention programs. Using only data from schools using EasyCBM or AIMSweb in effect narrows the study's scope to any district that would use either intervention program. The sample contains only schools that use EasyCBM solely for their intervention or solely AIMSweb for intervention. Data collected in the study is also confined to universal screener scores and risk indicator levels.

Both programs allow diagnostic information to be gathered and analyzed to provide appropriate individualized interventions for each student. Schools in the study that used EasyCBM for Universal Screening have since moved to the Northwest Evaluation Association (NWEA) Measures of Academic Performance (MAP) assessment for universal screening. The MAP assessment is a computer-based assessment that is adaptive in that it adjusts the level of difficulty to the student as they take the test.

Overview of Study

Chapter 1 presents a statement of the problem, significance for the study of EasyCBM and AIMSweb, and concerns regarding the two programs' efficacy. This chapter also presents the importance of the study's research, definitions, limitations, and delimitations.

Chapter 2 presents research in the areas of interventions and their application within the framework of RTI, including intervention practice and development, intervention applications, the promise of response to intervention, expanded intervention applications, customizing interventions to the needs of the Student, EasyCBM, EasyCBM application challenges in the area of math, EasyCBM application challenges in the area of reading, and AIMSweb. Chapter 3 presents the methodology, including guiding research questions and null hypothesis, population sampling information, data sources, data collection, data analysis, and a chapter summary. Chapter 4 will present the findings of the study and a chapter summary. Chapter 5 provides a statement of the problem, discussions, conclusions, implications for practice, recommendations for future research, and a chapter summary.

Chapter 2. Literature Review

As it is known today, intervention is the culmination of over 300 years of social, political, and academic influences (Karoly et al., 1998). Early philosophers and educators explored early childhood development concepts and what factors influenced children's learning process. Early intervention theory and practice today were shaped by the first efforts in the early 1960s at enhancing development in children with mental retardation thought to be caused by inadequate home environments (Karoly et al., 1998). As a result of this study, more targeted intervention methods were developed based on children's needs.

A wide range of ideas has informed the body of knowledge about instruction in reading comprehension of research methods. This knowledge base of intervention methods is that culminating evidence exists for a substantial majority of the claims presented above regarding instructional and intervention practice principles (Snow, 2002). The Rand Reading Study Group proposed a focus on reading comprehension as a starting point for intervention methods. The Rand Reading Study Group offered strategies for developing a reading comprehension program with a step-by-step guide to implementing a program designed to provide comprehension strategies at grade level for students struggling to meet grade-level text demands within the curriculum. The quality of reading instruction in public education has increased from the quantity of a 25-year program of research with a focal point on understanding the development of word reading and formulating interventions for children experiencing difficulties in reading (Snow, 2002). The Rand Reading Study Group's research reinforced the need to explore different intervention methods. The Rand Reading Study Group prescribed educational institutions' method to develop methods specific to their stakeholders' needs in reading comprehension areas.

Even with this knowledge moving forward, regular classroom teachers may not have received the necessary training and information required to correctly recognize the characteristics of a disability, such as one in written language and its effects on performance in mathematics (Gardner, 2011). While many institutions were developing interventions for reading instruction, no studies were found that specifically address the response to intervention framework and disabilities in written expression in mathematics. RTI^2 attempts to meet students at their instructional level and address specific student area deficits. Tier 1 support in math involves explicit instruction to all students in the general education classroom, with opportunities to master skills. Tier 2 supports are provided individually or in small groups of students who require further intervention in the general education classroom. Tier 3 supports are most rigorous and furnished to students who require further, more intensive intervention and instruction (Gardner, 2011). Appropriate tier-level instruction is at the backbone of a successful implementation of the RTI^2 program.

One of the most challenging tasks we face as classroom teachers are finding ways to reach all our students and equate each student's level of mathematical readiness and performance to the skills we must teach (Gresham & Little, 2012). In Tennessee, this is where school districts are presenting difficulties. Identifying students through a universal screening process is a mandatory procedure when implementing RTI^2, but how that data is interpreted is where districts are identifying difficulties. Some challenges that school districts face can be remedied by exploring some methods of helping teachers identify students in need and then provide appropriate intervention strategies with little to no outside resource allocation (Gresham & Little, 2012).

Student interviews can help educators determine where specific needs are present by collecting an inventory of student skill sets and comprehension. With the implementation of Response to Intervention (RTI) throughout the United States and the strong evidence that validates the use of RTI as a way of supporting struggling students, teachers need ways to understand and reach Tier 2 students within their classrooms (Hodges, 2012). Student interviews allow for a precise understanding of a student's needs and allow the teacher or interventionist to develop a scope and sequence when delivering needed instruction. The Tennessee State Department of Education recommends using an Early Warning System (EWS) that considers previously recorded student data collected from discipline, attendance, and test scores (Tennessee Department of Education, 2016). Even with the EWS, interviews can provide insight into exactly where a student is having difficulties with the subject area.

Implementation of Response to Intervention at the high school level has come to fruition in Tennessee beginning in 2013. Response to Intervention has been spurred on by the need to fill the gap in students who do not qualify for special education services but demonstrate a lack of reading and math proficiency. Several curriculum-based approaches to assessment have been described as alternatives to traditional norm-referenced testing that can directly link assessment data and the general curriculum (Burns, 2002). Research on the RTI implementation at the high school level and subsequent studies on its effectiveness levels has been limited as it is relatively new and continuously developing (Swartz et al.,2011). The expectation is that many more examples of literature on effective intervention practices coupled with the use of EasyCBM and AIMSweb will surface as programs develop and interventions are implemented.

Intervention Practice and Development

The Tennessee Department of Education (2016) developed a standard for Response to Intervention and Instruction (RTI2) framework that provides a guide for districts and schools in promoting positive outcomes for all students in Tennessee (Deloach & Woodason, 2017). The Tennessee State Department of Education also developed a manual to be used in conjunction with the implementation of Response to Intervention as a guideline for local school districts. The Tennessee Department of Education (2016) describes RTI as the following:

> Response to Instruction and Intervention (RTI^2), which is Tennessee's framework for teaching and learning, begins with high-quality, differentiated instruction throughout the day and emphasizes intervening with students when they first start to struggle to avoid prolonged academic difficulties. (p. 5)

Student growth is compared to progress toward a predetermined goal, assessed with fluency and graphed measures to display students' progress (Burns, 2002) visually. The Ready Student is defined in the Tennessee State Department of Education RTI^2 manual as having "… strong academic and technical content knowledge and skills, is ready for a post-secondary and career and has developed the social and emotional skills necessary to be a productive member of our state's economy" (Tennessee Department of Education, 2016, p. 7). The Tennessee Department of education established four goals: to rank in the top half of the states on NAEP by 2019, for 75% of the state's third graders to read proficiently by 2025, for the average ACT composite score to be 21 by 2020, and for the majority of high school graduates in 2020 to earn a postsecondary certificate, diploma, or degree (Gladson et al., 2017). The information documented in the guidelines for ready students establishes that students "…should have the ability to use common technology (including social media) and technical skills in select fields

that would allow them to enter and complete post-secondary education without remedial coursework seamlessly" (Ables et al., 2016, p. 7).

Furthermore, students should be able to "… exit with pliable credentials leading to career pathways and earn living wages" (Ables et al., 2016, p. 7). According to the state department, the basis of Response to Intervention is for educators to provide high-quality, data-driven, differentiated instruction for all students every day. A specific goal of educators should be to identify and understand the nature of non-responsiveness to generally effective instruction (Fuchs & Fuchs, 2005).

To successfully implement RTI, school leaders must understand the importance of providing adequate professional development and practice opportunities with teachers' data-based decision-making (Marsh & Ferrall, 2015). Successful implementation of response to intervention and instruction begins with the interventionists. The local context in which RTI is implemented is a crucial component of its success or failure (King-Thorius et al., 2014).

Intervention Applications

When implementing RTI^2, districts administer universal screeners three times each year, using the data to identify students at risk who might benefit from additional supports and targeted interventions (Alonzo, 2016). Establishing the student's instructional level is a starting point for beginning the CBM process (Garcia, 2007). The state manual also lists a recommended timeline of delivery of the components and what differentiation of instruction should look like for students enrolled in the program at each of the tiered intervention levels. Three tiers of intervention are offered within the RTI^2 model. The first tier is considered general day-to-day instruction and is offered to every student in the regular classroom setting. Tier 2 encompasses

the bottom 20% of students than national norms and their immediate grade-level peers. Tier 2 provides more individualized instruction than Tier 1, and class sizes are limited to a six to one student to interventionist ratio. Students are screened for deficits in reading fluency, word decoding, spelling, and fundamental math skills (Tennessee Department of Education, 2016). Tier 2 students generally have a basic understanding of reading and math skills and, in conjunction, will receive more individualized instruction based on their needs. Tier 3 students are within the bottom 10% of all students screened to compare the national norms and their immediate grade-level peers. Tier 3 students receive the most intensive interventions, and the student to teacher ratio is limited to three students for every interventionist. Interventions at this level may include learning basic math, spelling, and writing skills. If a student should fall out of the bottom 10% of students receiving intervention and no progress is being made, a referral for special education services is the recommended course of action where the most intensive services can be individually provided (Tennessee Department of Education, 2016). The high school application of intervention is essential because it helps identify culturally and linguistically diverse (CLD) youth with and without disabilities (Kressler, & Cavendish, 2019). Pullen and Kennedy (2019) described the teacher's goal to find the balance that challenges the child with the material within reach based on the child's ability level but is not so quickly learned that the task is tedious or considered a waste of instructional time. Decisions for making instructional change and movement within the RTI tiers can be implemented, monitored, and evaluated in this manner for producing desired improvements in student achievement (Murphy, 2016).

The RTI^2 implementation guide lists general procedures for applying the intervention and instruction. These procedures are recommended intervention times per day of instruction and

some state-approved tools for fidelity monitoring. According to the RTI^2 state manual, "In August 2014, the Tennessee Department of Education utilized a statewide RFP process to identify universal screeners and progress monitoring tools that met all the criteria outlined in the RTI^2 framework" (Tennessee Department of Education, 2016, p. 23). The request for proposal (RFP) process was intended to guide districts as they decided which vendors to select their universal screening and progress monitoring tools. A list of those vendors and program criteria for RFP are listed in Figure 1.

Figure 1

RFP Criteria for Cost Negotiation

Vendors meeting state criteria and entering into cost negotiation with the state		
Area Assessed	Universal Screening	Progress Monitoring
Reading	**AIMSWEB** NCS Pearson, INC. **EasyCBM** The Riverside Publishing Company	**AIMSWEB** NCS Pearson, INC. **EasyCBM** The Riverside Publishing Company
Math	**AIMSWEB** NCS Pearson, INC. **EasyCBM** The Riverside Publishing Company	**AIMSWEB** NCS Pearson, INC. **EasyCBM** The Riverside Publishing Company
Writing	**AIMSWEB** NCS Pearson, INC.	**AIMSWEB** NCS Pearson, INC.
Vendors meeting state criteria, but not entering into cost negotiation with the state*		
Area Assessed	Universal Screening	Progress Monitoring
Reading	**DIBELS** Amplify Education, Inc., Dynamic Measurment Group, and Voyager Sopris Learning Inc.	**DIBELS** Amplify Education, Inc., Dynamic Measurment Group, and Voyager Sopris Learning Inc.

**The state is unable to enter into a contract with Amplify Education, Inc., Dynamic Measurement Group, and Voyager Sopris Learning, Inc. due to the state's procurement process. However, DIBELS—the product submitted for review—does meet the state's technical score requirement and is identified as a product that meets state criteria for universal screening and progress monitoring. As with all vendors, districts may reach out to these vendors directly for provision of a universal screener and/or progress monitoring tool.*

The Promise of Response to Intervention

Although RTI is a K-12 initiative, there is little to no research examining RTI within a high school context (Brozo, 2009). Specifically, high school settings may present challenges due to disparate achievement on standardized tests leading to poor graduation and high dropout rates for students (Stark et al., 2015).

Increased focus on standards-based accountability has intensified the efforts to individualize instruction for students with and without disabilities in general and special education settings, particularly as inclusive placements for students receiving special education and related services continue to increase year after year (Kena et al., 2014). Ridgeway et al., (2012) asked, "Is there enough research to support the promise?" (p. 2). Questions arose about the effectiveness of RTI in general. Ridgeway et al. (2012) posed the question, "Are the principal components of Response to Intervention built on a solid empirical foundation?" (p. 2). Ridgeway, Price et al. research underscores this study's purpose to look more explicitly at EasyCBM and AIMSweb and their effectiveness levels with students. Although the comprehensive instruction and targeted interventions included within the RTI framework may encompass much different intensity and individualization levels, interventions are generally situated into three broad classes or tiers. Using one piece of information from one component through screening does not allow for accurate or most effective intervention practices. According to Ridgeway et al., "…within RTI, these components do not function independently, and this combination of components serves as a vehicle for providing students with the most appropriate academic services" (p. 6). Ridgeway et al. support RTI for academics and behavior:

> Specifically, the majority of studies that examined the impact of RTI on academic achievement or student performance resulted in some level of notable improvement,

> thereby suggesting that a multi-tiered intervention approach can improve the academic outcomes for students at risk of academic failure. (p. 83)

As the instructional plan or intervention nears its end, outcomes can also be evaluated to determine if the discrepancy between a student's actual and expected performance was reduced to the point it is no longer a problem in learning or if additional supports are necessary (Murphy, 2016). Ridgeway et al. (2016) cautioned about the data being gathered and collected from elementary sources and primarily in literacy. Ridgeway et al. states, "Furthermore, while evidence suggests, to a certain degree, that the implementation of the RTI model improves academic performance, this generalization relates primarily to early literacy skills, which may only apply to students at the elementary level" (p. 12).

Further supporting the need for comparison between EasyCBM and AIMSweb, there are many recorded versions of RCBM's in use today but using various applications and mixtures of CBM's and RCBM's could affect the outcome of student scores. According to Merrill, "Nonetheless, not all RCBM forms are the same, and the differences in features across published versions could affect student scores" (Merrill, 2018, p. 5). Merrill provides data indicating significant differences in RCBM application and CBM application. "Mixed results were obtained when analyzing correlations between RCBM and a computer-administered universal screening measure in reading. Significant differences were found in the overall number of words read correctly, dependent on the passage set" (p. 6). Merrill's research explored the application of computer-based measurements and written measurements. Significant differences were also noted in the number of students identified as at-risk in reading or need of intervention based on each screener compared to other standardized reading tests (Merrill, 2018). Universal screeners alone do not provide adequate data to determine the specific area that needs to be targeted

(Ghassemieh, 2017). Response to intervention should relate specifically to instruction (Murphy, 2016). Individualized instruction should be a result of Data-Based Instructional Decision-Making (DBIDM). To ensure that the appropriate area of concern is identified and determine if students are making adequate or significant progress with the prescribed intervention, teachers must analyze and interpret RTI data and make data-based instructional decisions (Albritton & Truscott, 2014; Vujnovic et al., 2014).

Expanded Intervention Applications

Fletcher and Vaughn (2009) describe the difficulties of implementation at the high school level. According to Fletcher and Vaughn:

> Scaling issues are also complicated because of incompleteness in the intervention evidence base. The question of how to implement RTI models in secondary schools is daunting, especially given weaknesses in research studies on interventions and progress-monitoring tools for older students. (p. 4)

The inconsistency in implementation from district to district becomes more evident at the high school level than in elementary. Informal assessments (i.e., curriculum-based assessments and performance-based assessments) are also valid and essential data that should be used in addition to formal standardized assessment data for educational decision making (Kressler, & Cavendish, 2019).

Otaiba et al. (2015) addressed the beginnings of Response to Intervention in terms of US policy and the purposes of early literacy interventions. According to Zirkel and Thomas (2010), "RTI models are in use in all 50 of the United States for intervention, but policy guidelines for how to use RTI to identify students as reading disabled are lacking" (p. 261). Otaiba et al. found

that, even though policy guidelines were in place, implementation methods were not consistent around the country. Otaiba et al. also found that it was better to prescribe and provide intervention to students in need and that this practice was more effective than not providing intervention. Otaiba et al. further found that "The intent-to-treat analysis used multi-level modeling and revealed an overall effect favoring the Dynamic RTI condition" (p. 3). RTI^2 models are favored over the 1- tier model of intervention. The latter of the two models more closely resembles the RTI^2 model this paper attempts to address by comparing the two types of intervention.

Customizing Intervention to the Needs of the Student

For the RTI process to work, administrators, teachers, and parents must accept the changes that have come with implementing the RTI process. In the RTI process, the teacher's role is to identify students with academic or behavioral difficulties (Horne, 2017). Hall and Mahoney's (2013) findings included:

> A quantitative quasi-experimental research study was conducted to examine the archived reported information of educational plans associated with self-reported perceptions of classroom practices and RTI implementation by teachers at selected demonstration and comparable schools in a large Florida school district to gain an understanding of the experiences from teachers involved in meeting the academic needs of struggling and learning-disabled special education students. (p. 273)

Hall and Mahoney's 2013 results found no significant difference in student performance from general education teachers and comparable teachers using intervention methods. A

common theme presents a belief that intervention practices effectively help student performance. Without receiving high-quality professional development, teachers may not have the knowledge and skills needed to implement data-based decision-making practices effectively (Ghassmeih, 2017). Ghassmeih recommended professional development opportunities for all involved in response to the intervention process to help with intervention effectiveness.

Maskill (2012) found that, if students receive high-quality, research-based literacy instruction and RTI intervention, they can make gains in reading. However, there is no way of telling the long-term effectiveness of RTI based on this study alone; more longitudinal studies are needed. Maskill stated:

> Response to Intervention officially became part of special education law and policy when incorporated within the 2004 amendments to the Individuals with Disabilities Education Act. In the simplest terms, it was designed to replace the flawed diagnostic procedures that had been used previously to identify students with specific learning disabilities. (p. 2)

As King et al., (2012) stated:

> A joint report released by the National High School Center (NHSC), National Center on Response to Intervention (NCRTI), and Center on Instruction (COI) (2010) suggested RTI has the potential to enhance the ability of secondary schools to improve student academic performance. (p. 6)

However, King et al. (2012) continue with the following caveat, "As a result of this recommendation, statutory support for RTI, and the success of RTI in elementary settings, school district leaders are increasingly recommending that secondary administrators implement RTI in their schools with the hopes of dramatically improving student performance" (p. 2).

According to Alsalamah (2017), "Professional development procedures guide educators in making decisions about students, and such decision-making is considered the core process in every RTI model" (pp. 6-17). Combined with Alsalamah's belief is the inherent trust in the RTI process's tools. Alsalamah further states that "The teachers could not distinguish if students' reading problems resulted from a lack of language or learning disabilities" (p. 8). RTI and instruction practices subsequently changed teacher perceptions about response to intervention. Tier 2 RTI contains various approaches developed to teach struggling readers decoding, fluency, vocabulary, and comprehension. With this understanding of the providing of intervention, teachers began to understand the benefits of intervention. According to Alsalamah, this kind of program can positively change teachers' beliefs, thus influencing their satisfaction with their practices. This information led to more positive results and effects with RTI implementation over a prescribed amount of time.

According to Cowan and Maxwell (2015), "The Response to Intervention Framework has created a change in the paradigm of the educational system where educators must pursue other avenues before embarking on testing and labeling a child" (p. 1). The results of Cowan and Maxwell's study indicated that, while the basic framework and intent of response to intervention were grounded on proven research-based prescribed interventions, further customizing student interventions were required to maximize the program's effectiveness. "Results from this naturalistic inquiry are significant because of the contribution the study makes to the research literature that could modify the structure of the implementation of Response to Intervention" (p. 2). Implementation of the RTI model requires that educators know how to identify specific skill deficits, use interventions to correct those skill deficits, conduct frequent measurement of the targeted skills, and evaluate student performance using single-subject design methodology

(Ardoin & Daly, 2007). Suppose educators are to apply RTI principles to the instruction of mathematics. In that case, they need a vast repertoire of evidence-based interventions to choose appropriate strategies for students who present with various types of difficulties and characteristics (Codding et al., 2009). In addition to the need for more evidence-based interventions, it is necessary to have valid and reliable methods that can be used to match instructional interventions to the specific skill deficits that are being displayed by a particular student (Vaughn & Fuchs, 2003). Formative evaluation allows teachers to monitor student progress due to varied instruction (Murphy, 2016). Response to Intervention is a model that can provide increased levels of instructional intensity through evidence-based strategies and interventions (Deloach & Woodason, 2017).

Curriculum-based assessment (CBA) has proven to address the need to discover student shortfalls in reading and math (Fanning, 2016). According to Gravois and Gickling (2002), CBA allows educators to make evidence-based decisions when selecting interventions for students. Depending upon the school's culture and individual teachers' beliefs, the decisions range from adopting a pre-packaged curriculum to designing one's lesson, sometimes using materials produced by others, or creating one's materials (Fanning, 2016). Levels of efficacy can and may vary through the curriculum's constant adjustment when left to the interventionists to decide what is best for each student. Intervention can be intensified by increasing the frequency, length, and duration of sessions, increasing the expertise of the instructor; decreasing the group size; or varying the type of delivery of treatment (Fuchs & Fuchs, 2015; Fuchs et al., 2017).

Although data-based decision-making is widely recognized as the best practice for intensifying struggling readers' interventions, empirical evidence for this method's efficacy is sparse (Filderman et al., 2018). For teachers to effectively cycle through the data-based decision-

making process, high-quality professional development is needed (Ghassmeih, 2017). According to Murphy (2016), "…researchers suggest that the success of all tiered systems relies on the validity of the measurement, evaluation, and strength of the interventions found in the first tier – from which the model's supports build in intensity and individualization" (p .68). According to Fanning (2016), "This means that decisions can be biased or influenced by factors that are not relevant to educational success" (p. 23). Instructional changes could include modification of frequency (e.g., length of sessions or days each week), the pacing of instruction, group size, individualization of content, or component dosage (e.g., increasing time spent on phonemic awareness) (Filderman et al., 2018).

In an Executive Summary report of the U.S. Department of Education, a study was conducted concerning the implementation of Response to Intervention at 1200 elementary schools around the United States of America. According to Bahu et al. (2015):

> This report provides new information on the prevalence of RTI practices in elementary schools, illustrates the implementation of RTI practices for groups of students at different reading levels, and provides evidence on effects of one key element of RTI: assigning students to receive reading intervention services (p. 1).

Bahu et al. (2015 report reinforces that providing intervention is effective but adds that adjusting the implementation to fit the student's specific needs past the prescribed intervention yields higher efficacy levels. According to Sparks (2015):

> Response to intervention has become ubiquitous as a framework to teach students to read in elementary schools, but the most comprehensive federal evaluation of the approach to date finds that it may hold back some of the children it was originally designed to support. (p. 1)

Sparks' 2015 statement is not consistent with most of the available research. Sparks goes on to specifically describe interventions at the first-grade level. Sparks conceded that first graders who received reading interventions did worse than virtually identical peers who did not get the more targeted assistance, according to the study released by the National Center for Education Evaluation and Regional Assistance. Now, with more than 70 percent of school districts across the country incorporating RTI in at least some classrooms, it has become more of a general education approach, with all of the trade-offs that entail (Sparks, 2015). Reasonings behind the lack of improvement of interventions vary from improper identification to improper implementation. Teacher sense-making of data within RTI highlighted that DBDM within RTI would not make substantial changes in instruction or placement decisions (Kressler, & Cavendish, 2019). To drive instruction to meet students' current needs, teachers must gauge students' progress on these standards regularly throughout the school year (Mitchell, 2016). According to Sparks (2015):

> From fall to winter of the 2011-12 school year, 1st graders who had been identified for Tier 2 interventions in the fall performed 11 percent lower, significantly worse, on a test of overall reading ability used by the federal Early Childhood Longitudinal Study that winter, in comparison to students who barely missed being identified for interventions in the fall. (p. 2).

With this more recent information about intervention effectiveness, a growing need for professional development to expand intervention delivery became apparent. Teachers who are knowledgeable about instruction play a significant role in helping children learn to read, especially children at risk for reading failure (Brady & Moats, 1997). The problem becomes determining what teachers know to teach reading effectively (Podhajski et al., 2009). To ensure

that teachers receive adequate training in reading, Brady and Moats (1997) proposed that teacher preparation should ensure that teachers have a solid foundation in theory and research-based concepts for understanding literacy development. Brady and Moats furthermore proposed that teachers understand the structure of both written and spoken language and provide teachers with many teaching opportunities with a mentor. According to Podhajski et al., when teachers have the necessary knowledge and skills to meet the needs of students struggling to learn to read, students make significant progress (pp. 403-417). According to Fuchs and Fuchs (2012), CBM provides teachers with an easy and quick method of obtaining empirical information on their students' progress. With frequently obtained student data, teachers can analyze student scores to adjust student goals and revise their instructional programs. With this background of the development of intervention practice in mind, the remainder of this literature review will focus on EasyCBM and AIMSweb intervention programs.

Both EasyCBM and AIMSweb contain tools interventionists may use to identify students' academic needs through universal screening. This identification process allows for the identification of specific skill area deficits. Those identified allow for intervention to take place then. A comparison of features is presented in Table 1.

Table 1

Features Comparison

Features	AIMSweb	EasyCBM
Phonemic Segmentation Fluency	✓	✓
Letter Sound Fluency	✓	✓
Letter Naming Fluency	✓	✓
Nonsense Word Fluency	✓	
MAZE (reading comprehension)	✓	
Word Reading Fluency	✓	✓
Passage Reading Fluency	✓	✓
Multiple Choice Reading		✓
Math	✓	✓
Spelling and Writing	✓	
K-12 Assessments		
K-8 Assessments	✓	✓
Common Core, State Standards		✓

Note. Table 1 shows the reported features list from each application's manual (Tennessee Department of Education, 2016)

EasyCBM

EasyCBM was developed in response to a need for an effective unified intervention program for a Multi-Tiered System of Support for students who present with at-risk characteristics both in academics and behavior. CBM provides a viable and technically strong approach for quantifying student progress (Fuchs and Fuchs, 2012). CBM research, conducted over the past 30 years, has also shown CBM to be reliable and valid (Germann & Tindal, 1985).

EasyCBM has been identified as one of the two state-recognized programs that may be used as an intervention program in conjunction with state-mandated intervention program requirements. Critical components to early identification of students in need of support include administering universal screening assessments and the analysis of existing student data such as attendance, grades, office discipline referrals, and prior performance on statewide assessments (Stevenson, 2017). The EasyCBM assessment system includes two types of mathematics tests: one type aligned to the National Council of Teachers of Mathematics Focal Point Standards and another aligned to the Common Core State Standards in Mathematics (CCSS Math) (Alonzo, 2016). According to Hosp et al. (2011), one approach to identifying such students is using universal screeners. Universal screeners are brief assessments of basic skills used to determine which students need additional supports and services. According to Stevenson (2017), "At the secondary level, universal screening may be used to identify students in need of support and catch academic or behavior problems that may otherwise go unnoticed" (p. 195-208). Universal screening allows for an opportunity to help identify students at risk but is not the sole indicator

for determining eligibility. Determining the grade level at which the student is functioning without frustration increases the student's optimal learning experience (Garcia, 2007). According to Stevenson (2017), “Recent research has explored both the technical adequacy of screening measures and novel approaches to screening such as multiple gating procedures and composite scores that use CBM and extant data” (p. 195-208). Universal screening performance data is compared to a national norm database to help with accurate placement and appropriate prescribing of specific intervention trends. According to Stevenson (2017), “Despite evidence from several studies and reviews that support the use of CBMs for students in middle schools (Baker et al., 2015; Barth et al., 2012; Codding et al., 2015; Denton et al., 2011; Yeo, 2009), practitioners do not necessarily view CBM as a satisfactory screening mechanism” (p. 196). As a result of the studies mentioned above, an early warning system (EWS) is recommended to be used in conjunction with universal screening to help identify students in need of intervention.

Academic performance, attendance, and behavior data are a part of student tier placement for intervention as part of the EWS. In addition to the math tests, the EasyCBM system provides various reading assessments (Alonzo, 2016). Included within EasyCBM and AIMSweb are the Maze assessments. According to Stevenson (2017), “Maze is a CBM that assesses silent reading fluency and basic reading comprehension” (p. 195). Incorporating the early warning system in conjunction with the MAZE and M-CAP assessments within each program provide trigger data for further study of student performance. The teacher then uses the information gained from the completed CBM to create individualized interventions (Garcia, 2007). Both assessments are a part of the universal screening process and may double as benchmarks for progress monitoring.

EasyCBM Application Challenges in the Area of Math

Not only does EasyCBM address needs in the areas of reading fluency and comprehension, but it also addresses needs in the area of mathematics. The types of problems used in M-CBM are developed through two approaches: curriculum sampling or robust indicators (Foegen et al., 2007). Curriculum sampling uses grade-level examples that require at-grade level skill sets to solve. According to Hensley (2015), "This allows for a direct link to the curriculum so teachers receive immediate feedback and can design instruction to teach specific skills" (p. 1). Robust indicators are made up of skills representing general markers of proficiency in mathematics instead of directly linking to the curriculum (Christ et al., 2008). Lack of fluency indicates inefficient counting strategies (Hensley, 2015). If students must count on their fingers or draw pictures to solve basic facts, they will have difficulty understanding more complex skills (Bryant et al., 2003; Gersten & Chard, 1999). Having an inventory of individual student skill sets and capabilities allows teachers and interventionists to make data-driven decisions on how to provide the best specific interventions allowing for student gains. Basic skills are necessary as a foundation for more difficult mathematics skills (Fuchs et al., 2006; Vukovic & Seigel, 2010). CBMs were designed to be quick instruments with standardized administration and scoring procedures, but issues still arose with the time commitment, consistent administration, and data collection (Fuchs et al., 1994). They are temporary measures when referring to student involvement and time, but there is still quite a bit of teacher time involved. (Hensley, 2015). Even though the use of basic facts as a measure of overall mathematics has not been held in the highest regard, research has shown that fluency with basic facts is an important skill (Hensley, 2015). EasyCBM skillsets for students encompass kindergarten through 8th-grade level mathematical skills. The EasyCBM norms were established in 2014 using a nationally

representative sample of students in grades K-8 with demographics matching the school-aged population's demographics (Alonzo, 2016). These are aligned with the state standards, but their application at the high school level has its challenges. According to Clarke et al. (2018), "Despite recognition of the importance of mathematical knowledge and its acquisition as a fundamental goal of schooling, systematic efforts to increase mathematics achievement are limited" (p. 1). Early mathematics screening measures are developed with curriculum-based measurement (CBM) (Deno, 1985). CBM's emphasize measures demonstrate strong psychometric properties, including the capacity to model student growth, but they are simple, efficient, and easily understood. (Clarke et al., 2018).

Most large-scale assessment and accountability systems assume that all participating students have an equal opportunity to learn what they are expected to know and are tested on (Elliott et al., 2016). These assessments are also conducted and normed with intervention results where students with disabilities are normed under the same standards as students without disabilities. One of the challenges of accurately reporting interventions is the mixed application of intervention within these groups. Kurz et al. (2014) argued that providing students with disabilities and students without disabilities equal opportunities to learn may be unfair to students with disabilities. This unfairness is in part because the unique learning challenges of students with disabilities may require as they receive more instruction than general education students to be academically successful (Kurz et al., 2014). Specifically, Kurz et al. found in classrooms sampled in Arizona, Pennsylvania, and South Carolina that students with disabilities experienced significantly less time on standards, less time on instruction, and less content coverage compared with their overall class. This weak foundational understanding rendered useless the equity-focus of RTI designed to shift the focus from student test performance to

analyzing and adjusting the learning environment (Kressler & Cavendish, 2019). With the discrepancy residing in the constancy of application, the question may arise to the reliability and validity of comparative norms when using computer-based measurement to monitor all students within the Tier 2 and Tier 3 intervention levels.

EasyCBM Application Challenges in the Areas of Reading

Deficits in word reading skills are often the root cause for readers who struggle with fluency or comprehension (Carver, 1998; Murray et al., 2012). Oral reading fluency (ORF) was investigated initially by Deno et al. (1982), with a plethora of studies published since then (Tindel, 2013). With most students failing to meet reading proficiency standards, it is prudent to examine how educators make instructional decisions to prevent reading failure (Kern & Hosp, 2017). Examples of instructional decisions include selecting an instructional focus, intervention selection, placing students in instructional groups, determining intensity and frequency of interventions, and determining the need for additional assessments (Hamilton et al., 2009).

The need to remediate students in reading fluency is necessary for response to intervention. (Batsche et al., 2005). In part, this is likely due to the emphasis with most RTI approaches on collecting learning data over time to evaluate instruction using some decision-making process (Batsche et al., 2005). As a measurement system, ORF appears technically adequate concerning other important indicators (e.g., statewide tests) and is sensitive to change within the year. (Tindel et al, 2016). EasyCBM does not recommend interventions for students; however, it provides a list of acceptable interventions and curriculums for use with at-risk students.

Oral reading fluency growth tends to be greater from fall to winter than winter to spring; more so in early grades than in later grades, and more significant for students in the general education population and native English speakers than for students receiving special education services or students receiving English language learning services. (Tindel et al., 2016). According to Tindel et al. "Although such studies provide important insights into the construct of oral reading fluency, and several, in particular, address issues related to the psychometrics of such measures, the controlled nature of the sampling plans used may limit their generalizability to actual school settings" (p.30). As a result, EasyCBM suggests using multiple sources of information for the process of diagnosing and placing students in Response to Intervention. One challenge in monitoring oral reading fluency by applying EasyCBM is the constant monitoring and tracking of student data. According to Tindel et al. (2016), rather than adhere to a regular schedule of test administration as noted in the research or as recommended on the website for the National Center on RTI (http://rti4success.com), teachers tend to monitor progress in somewhat inconsistent ways (pp. 28-40). With the critical importance of word reading to overall ready ability, it is prudent that teachers make accurate and informed instructional decisions to ensure their students acquire practical word reading skills (Kern & Hosp, 2017).

AIMSweb

AIMSweb has been identified as one of the two recognized computer-based intervention tools used for universal screening and progress monitoring by the State Department of Education for Tennessee. Given the resources required to deliver intensive intervention or deliver special education services, the ability to accurately determine whether a student is improving at an adequate rate is critically important (Norman & Parker, 2018). "The AIMSweb maze task is a

reading task that uses passages between 150 and 400 words. The first sentence is left intact, and then every seventh word is replaced with three choices in parentheses" (Ford et al., 2018, p. 124). "The multiple-choice items consist of the correct answer and two distracter items" (Shinn & Shinn, 2002, p. 8). According to Deeney and Shim (2016), "Since the publication of the National Reading Panel (2000) report, increased attention has been paid to assessing oral reading fluency (ORF)" (p. 1). Many districts use one-minute ORF measures, such as the *Dynamic Indicators of Basic Early Literacy Skills* (DIBELS) ORF assessment (Good & Kaminski, 2002) and *AIMSweb Reading CBM (R-CBM;* NCS Pearson, 2014). Used in conjunction with AIMSweb data, these measures can help determine more accurate student placement within the multi-tiered support system. Although letter-sound knowledge is a foundational skill upon which more complex literacy development occurs, many current practices fall short of meeting many students' needs in this area (Earle & Sayeski, 2017). Recent research has demonstrated inconsistencies in the delivery of letter-sound instruction and limited efficacy of many letter-sound instructional approaches (Piasta & Wagner, 2010b).

Within the AIMSweb online program lies a progress monitoring system that allows for multiple intervention levels to occur at the Kindergarten through 8th-grade levels of performance for English-language arts and math. Researchers at AIMSweb have also developed a new rule that involves calculating a trend line for all collected observations and making decisions based on predicted performance (AIMSweb, 2012a). Interventionists universally screen students in multiple areas of language and math. AIMSweb then calculates the level of performance in percentiles compared to National Norms and, in turn, ranks the student within tier levels of intervention based on their specific needs. Once the areas of need are identified, the programs map out a prescribed series of interventions and progress monitoring within a four-and-a-half-

week timeline. This information is gathered, and every four and a half weeks, a new goal is set dependent upon student need. Intervention is adjusted and continued to have the students' progress and require less intervention to perform at grade level. When a student reaches consistent successful data points in succession, a review of their performance and capabilities is performed. At this point, recommendations are made and enacted based on the student's need.

According to Burns (2009), "Assessment is perhaps the very cornerstone of RTI" (p. 4) Although schools are more frequently engaging in assessment practices, some of the tools being used are psychometrically less than desirable (pp. 1-8). CBM is often used to guide educational decisions (Christ et al., 2008). Tennessee's education department examined multiple programs intended for intervention under the RTI framework. AIMSweb provided the features considered part of an effective intervention program. "The National Center on Student Progress Monitoring rated several measures to report whether there was sufficient evidence to address seven standards: reliability, validity, alternate forms, sensitivity to student improvement, adequate yearly progress benchmarks, improving student learning or teacher planning, and rates of improvement specified "(Burns, 2009, p. 4). AIMSweb was listed among these seven. CBMs are a set of short assessments that yield reliable and valid information regarding skill level in reading, math, spelling, and writing when administered using standardized directions and scoring procedures (LeRoux et al., 2018). All CBM tests were created empirically, with careful attention to construct-validity with the intent of identifying simple indicators or vital signs of more broad academic domains such as general reading achievement and mathematics achievement. (Shimm, 2012)

CBM test construction's goal was to find a single measure robust in information in each basic skills domain. Alignment to other accepted measures allowed for more accurate student

academic progression decisions (Shimm, 2012). There is clear evidence that oral reading fluency is necessary to enable comprehension (Christ et al., 2008). Shimm's ideas would also correlate with the Tennessee State Department of Education's needs within their criteria for selecting a computer-based measurement for RTI^2 implementation. Some of the initial research on CBM established that curriculum samples' difficulty could vary dramatically (Christ et al., 2008). AIMSweb utilizes national norms, which are constantly assessed and compared, allowing for updates with educational trends in foundational intervention methods. "AIMSweb's CBM tests are consistent, especially with their intended audience, *typically developing* students acquiring basic skills" (Shinn, 2012, p. 13).

According to LeRoux et al. (2018), "To aid in facilitating the timely development of student reading skills, schools and school districts now regularly use curriculum-based measures (CBMs) as screening and progress-monitoring assessments (p. 1). Curriculum-based measurements are commonplace in schools around the country to assess student reading and math fluency. Although there is variability in CBM-M curriculum samples' difficulty, methods to strategically sample, arrange, and assess skills can improve assessment outcomes' reliability and generalizability (Christ et al., 2008). According to LeRoux et al., (2018), "…a benefit of the maze measure is its face validity" (p. 9). Advantages of using CBM for screening and progress monitoring are that the use of CBM is (a) quick and efficient, (b) cost-effective, (c) involves alternate forms that can be administered over time, allowing the results of the assessments to guide data-based decision making, (d) aligned to the curriculum, (e) validated, and (f) technically adequate (Hosp et al., 2016). Performance on CBM-M tasks is a quick and easy indicator of performance on other mathematics assessments (Christ et al., 2008).

AIMSweb uses data in the form of progress monitoring to help observe student progress throughout the academic year. “The goal of progress monitoring is not punitive, but rather is to ensure that students are learning what the objectives of a curriculum have suggested will be taught” ("Hanover Research," 2019, p. 5). Hanover Research also stated that, “According to the National Center on Response to Intervention (NCRTI), effective progress monitoring must (1) assess student performance, (2) quantify student rates of improvement and responsiveness to instruction, and (3) evaluate instruction methods for effectiveness.” It is often written within the professional literature that CBM is a valid and reliable set of measurement procedures or that CBM is a sensitive measurement procedure (Christ et al., 2008).

According to Hanover Research (2019), “CBM uses frequent, regular administration of short tests that measure identical skills over an extended time” (p.7). Curriculum-based measurement (CBM; Deno, 1985) has been widely accepted as a valid and reliable technology for assisting educators with making data-based screening (i.e., identifying students at risk of academic difficulties). Progress decisions (i.e., measuring growth over time) in reading, mathematics, and writing (Hosp et al., 2016) by using CBMs, may help monitor progress. However, the teacher needs additional information that indicates the mathematical conceptions or misconceptions at the root of the issue so that he or she can determine appropriate instructional moves (Koellner et al., 2011).

Thus, the screening and monitoring of student progress in vocabulary or academic language in science may be beneficial to educators (Ford et al., 2018). A balance seems to be necessary between criterion-referenced (i.e., reaching levels of performance that are highly predictive of success on high-stakes assessments) and norm-referenced (i.e., ambitious yet realistic performance relative to similar peers) goals (Norman & Parker, 2018).

Chapter 3. Research Methodology

The purpose of this quantitative study is to determine whether there are significant differences in the levels of efficacy of EasyCBM and AIMSweb on student performance derived from students' universal screener scores and level of risk identifiers during the fall and winter of a school calendar year. The study focuses on data-driven decision-based instruction, teacher-developed intervention practices, risk indicators, and universal screening scores. The data gathered from EasyCBM and AIMSweb student performance reports will be entered using IBM's SPSS for data analysis. Independent t-tests, which test for significant differences between two means based on student universal screening scores were conducted for Research Questions 1 and 2 in the categories about the application of EasyCBM and AIMSweb delineated from Tiers 2 and 3 in both reading and math. For Research Questions 3 through 6, a series of chi square analyses were also conducted to evaluate whether the mean universal screener scores (of the student involved in either EasyCBM or AIMSweb) and being progress monitored (progressing through the Tiers 3 to 2 and 2 to 1) are significantly different. Students receiving intervention and their tier movement will be the test variable. The grouping variable will be EasyCBM or AIMSweb, Tier 2 and Tier 3 instruction, and fall and winter tier movement. Identifying common approaches with the application of intervention may help develop high-quality, individualized instructional practices in conjunction with the EasyCBM and AIMSweb frameworks for intervention.

Research Questions and Null Hypotheses

This descriptive quantitative study was guided by the following research questions and corresponding null hypotheses to determine whether a level of significant difference is present between EasyCBM and AIMSweb efficacy scores.

1. For Tier 2 students, is there a significant difference in Universal Screener Proficiency scores between students who are enrolled in EasyCBM and students who are enrolled in AIMSweb scores?

$H_0 1_1$: For Tier 2 students, there is no significant difference in Universal Screener Proficiency math scores between students enrolled in EasyCBM and students who are enrolled in AIMSweb scores.

$H_0 1_2$: For Tier 2 students, there is not a significant difference in Universal Screener Proficiency reading scores between students who are enrolled in EasyCBM and students who are enrolled in AIMSweb scores

2. For Tier 3 students, is there a significant difference in Universal Screener Proficiency scores between students enrolled in EasyCBM and students enrolled in AIMSweb scores?

$H_0 2_1$: For Tier 3 students, there is no significant difference in Universal Screener Proficiency math scores between students enrolled in EasyCBM interventions and students enrolled in AIMSweb intervention scores.

$H_0 2_2$: For Tier 3 students, there is no significant difference in Universal Screener Proficiency reading scores between students enrolled in EasyCBM interventions and students enrolled in AIMSweb intervention scores.

3. For Tier 2 students, is there a significant difference in the number of students who transition between Tier 2 and Tier 1 instruction enrolled in EasyCBM and students enrolled in AIMSweb?

$H_0 3_1$: For Tier 2 students, there is not a significant difference in the number of students who transition in math between Tier 2 and Tier 1 instruction who are enrolled in EasyCBM and students who are enrolled in AIMSweb.

H_03_2: For Tier 2 students, there is not a significant difference in the number of students who transition in reading between Tier 2 and Tier 1 instruction who are enrolled in EasyCBM and students who are enrolled in AIMSweb.

4. For Tier 3 students, is there a significant difference in the number of students who transition between Tier 3 and Tier 2 instruction enrolled in EasyCBM and students enrolled in AIMSweb?

H_04_1: For Tier 3 students, there is not a significant difference in the number of students who transition in math between Tier 3 and Tier 2 instruction who are enrolled in EasyCBM and students who are enrolled in AIMSweb.

H_04_2: For Tier 3 students, there is no significant difference in the number of students who transition in reading between Tier 3 and Tier 2 instruction enrolled in EasyCBM and enrolled in AIMSweb.

5. For Tier 2 students, is there a significant difference in the level of risk indicators (low, some, high) between students receiving intervention in EasyCBM and students receiving intervention in AIMSweb?

H_05_1: For Tier 2 students, there is no significant difference in math level of risk between students receiving intervention in EasyCBM and students receiving intervention in AIMSweb.

H_05_2: For Tier 2 students, there is no significant difference in the reading level of risk between students receiving intervention in EasyCBM and students receiving intervention in AIMSweb.

6. For Tier 3 students, is there a significant difference in the level of risk indicators (low, some, high) between students receiving intervention in EasyCBM and students receiving intervention in AIMSweb?

$H_0 6_1$: For Tier 3 students, there is no significant difference in math levels of risk scores between students receiving interventions in EasyCBM and students receiving interventions in AIMSweb.

$H_0 6_2$: For Tier 3 students, there is no significant difference in reading levels of risk scores between students receiving interventions in EasyCBM and students receiving interventions in AIMSweb.

Sample

This study included a self-selected sample of six high schools from within the Upper East Tennessee Region from the 2018-2019 school year. AIMSweb or EasyCBM data from their Response to Intervention programs. The study's sample size will encompass progress monitoring data and universal screening data for 765 students (275 or 2 schools utilizing EasyCBM and 435 or 4 schools using AIMSweb for intervention) from upper East Tennessee. These schools are in upper East Tennessee within an area spanning from Cocke County to Johnson County, bordering North Carolina. The cities and counties in the upper area region are as follows: Bristol City, Campbell County, Carter County, Cocke County, Elizabethton City, Green County, Greeneville City, Hamblen County, Hancock County, Hawkins County, Johnson City, Johnson County, Kingsport City, Newport City, Rogersville City, Sullivan County, Unicoi County, and Washington County. Four representative schools using AIMSweb and two using EasyCBM respectfully provided progress monitoring and universal screening data for this study. The online report, First Steps: A Report on Elementary Grades in Tennessee (https://www.tn.gov/content/dam/tn/education/reports/reading-report-2018-appendix.pdf) was used to collect which district used which intervention program and is listed in Table 2.

Table 2

Self- Selected School District Intervention Demographics

System	Number of High Schools Per District	Universal Screener	Progress Monitoring	Total Number of Students Receiving Intervention
Campbell County	2	EasyCBM	EasyCBM	184
Sullivan County	4	AIMsweb	AIMSweb	542

Note: Table 2 shows the program application data for self-selected schools Upper East Tennessee Region using either EasyCBM or AIMSweb

In total, 428 students make up the 20th percentile of those who fall within the possibility of receiving intervention at the Tier 2 level of intervention, with the final 10th percentile (297 of 726) receiving Tier 3 level interventions. All students were considered for this analysis; however, not all students completed a full year of intervention.

School systems taking part in the study are made up of rural families with average incomes of $58,000.00 a year per family. The region's racial makeup was 96.22% White, 2.12% African American, 0.20% Native American, 0.40% Asian, 0.02% Pacific Islander, 0.02% from other races, and 0.74% two or more races. Hispanic or Latino of any race were 0.92% of the population. Their service level will also categorize these for each student (Tier 2 and Tier 3). Delineations in sex, race, and demographic locals will not be considered for this study but could be used for future studies. The sample size (n) is approximately 600 students. Data included are

as follows: proficiency data, universal screener data and level of risk data, and numbers of students who progress through the tier levels in both reading and math areas.

Data Sources

The study is designed to identify interventions' effectiveness at Tier 2 and Tier 3 levels for reading and math areas. EasyCBM and AIMSweb provided student performance data and identified the area of student need. Archival data included rate of improvement scores, universal screener scores, and benchmarking data frequency. Archival data used in the study included universal screening scores, rate of improvement scores, and benchmarking data from individual students from the 2018-2019 academic school year. Names or other identifiers were not used in the study. Examples of these data sources are in Appendix A and Appendix B. Student performance data were compared using the start of the year benchmark scores of students in Tier 2 and Tier 3 categories, respectively, end of the year scores. Universal Screening scores were reported in the areas of reading and math. Composites universal screener benchmarks scores for the academic 2018-2019 school year were used to project student end-of-the-year achievement and transitional movement between the tiers. Transitional movement between the tier level of performance will be examined as well. The study included two local school districts within the Upper East Tennessee region to identify where significance, if any, resides in intervention practices and application and gain knowledge about the levels of participation in response to intervention and the teacher-developed intervention methods applied.

Data Collection

At the end of the 2018 - 2019 school year, data were requested from each school. Data included universal screener scores and levels of risk identifiers for the fall and winter of a student's enrollment in the program. Intervention identifiers to the student and teacher remain anonymous and only grouped to schools that either use EasyCBM or AIMSweb. Progress monitoring data will come from benchmark scores measured for each student with a frequency of every two and a half weeks for the academic year. A letter (Appendix C) served as the initial contact to the school system director(s) responsible for allowing studies to occur and further contacting each school's administrators. Demographical information will provide a baseline for comparison between six high schools. The schools were labeled A, B, C, respectively, and identified as using EasyCBM or AIMSweb.

Data Analysis

Data analysis for this quantitative study was performed using the Statistical Package for Social Sciences (SPSS). All incomplete data sets were discarded before entering any data in SPSS. Complete data sets were used to provide descriptive details about the effectiveness levels for AIMSweb and EasyCBM. Descriptive analyses comprised identifying means, standard deviations, frequencies and included percentages to summarize data. A significance score was calculated for each respondent by averaging the item scores together. A series of independent t-tests was conducted to measure the differences in universal screener scores for Research Questions 1 and 2. Chi-Square analysis was used for Research Questions 3 and 4 to measure for levels of significant difference in tier movement. Chi-Square analysis was also used for Research

Questions 5 and 6 to identify significant differences in levels of risks about student performance. An alpha level of .05 was used for all analyses.

Chapter Summary

Chapter 3 serves as a guide for research replication. Letters to school system district personnel served as initial contacts for study. Data were collected from student performance data in AIMSweb and EasyCBM. Data were then classified in their respective categories to complete the analyses. IBM's SPSS program was used to calculate analysis from the data collected.

Chapter 4. Findings

Chapter 4 details the analysis of research questions presented in Chapters 1 and 3. This quantitative study was conducted to determine whether significant differences existed between using available data from AIMSweb and EasyCBM in reading and math. Specific areas of interest included Tiers 2 and 3 in reading and math. Data was collected in the form of proprietary reports and stored electronically. Respondents were allotted the specified time to complete and return reports. School districts had to agree to participate and provide data for the study. No identifiable information was collected. All participants were consenting adults; therefore, no severe ethical concerns existed.

Data analysis was conducted using independent-samples t-tests for Research Questions 1 and 2. Chi-Square Analysis of data was performed for Research Questions 3 through 6. An alpha level of .05 was used for all analyses. Table 3 shows the sample sizes and their percentages for AIMSweb and EasyCBM for reading and math combined.

Six high schools from two school districts from Northeast Tennessee were selected for the study. Of the two school districts, both districts provided permission for archival data to be collected. Data points for AIMSweb reading and math were collected for 542 (74.65%) students, and 184 (25.34%) data points for reading and math were collected for students enrolled in EasyCBM. Intervention Program sample size can be seen in Table 3.

Table 3

Intervention Programs

Program	N	%
AIMSweb	542	74.65
EasyCBM	184	25.34

Note. Table 3 includes all data points for fall and winter universal screeners. Incomplete data sets were not included in the study.

Between Sullivan County and Cumberland County School districts, both provided permission for archival data to be collected. Data was compiled from the academic intervention areas of reading and math. 234 (79.59%) of reading scores reported were AIMSweb, while 60 (20.40%) scores were reported EasyCBM. 308 (71.29%) of math scores reported were AIMSweb, while 124 (28.70%) reported were EasyCBM. See Table 4.

Table 4

Intervention Program Total for Reading and Math

Program	N	%
AIMSweb		
Reading	234	79.59
Math	308	71.29
EasyCBM		
Reading	60	20.40
Math	124	28.70

Note. Table 4 includes all data points for reading and math universal screeners. Incomplete data sets were not included in the study.

All participating schools provided universal screener data and risks data for Tier 2 and Tier 3 level students. Students identified as Tier 1 presented incomplete data points and were excluded from the study. The level of risk indicated was also included in the data reports for both AIMSweb and EasyCBM. See Table 5.

Table 5

Grade Level Enrollment

Grades	N	%
AIMSweb		
Ninth	320	59.04
Tenth	222	40.95
EasyCBM		
Ninth	38	20.65
Tenth	146	79.34

Note. Table 5 includes all data points for ninth and tenth-grade universal screeners for fall and winter. Incomplete data sets were not included in the study.

All participating schools provided universal screener data and risks data for Tier 2 and Tier 3 level students. Students identified as Tier 1 presented incomplete data points and were excluded from the study. The level of risk indicated was also included in the data reports for both AIMSweb and EasyCBM. See Table 6.

Table 6

Tier Enrollment Both Reading and Math

Tiers	N	%
AIMSweb		
Tier 2	308	56.82
Tier 3	234	43.17
EasyCBM		
Tier 2	127	69.02
Tier 3	57	30.97

Note. Table 6 includes all data points for ninth and tenth-grade universal screeners for fall and winter. Tier 1 screener data was not included in this study. Total students screened in all schools totaled 2,734 with both AIMSweb and EasyCBM.

Analysis of Research Questions

Research Question 1

For Tier 2 students, is there a significant difference in Universal Screener Proficiency scores between students enrolled in EasyCBM and students enrolled in AIMSweb scores?

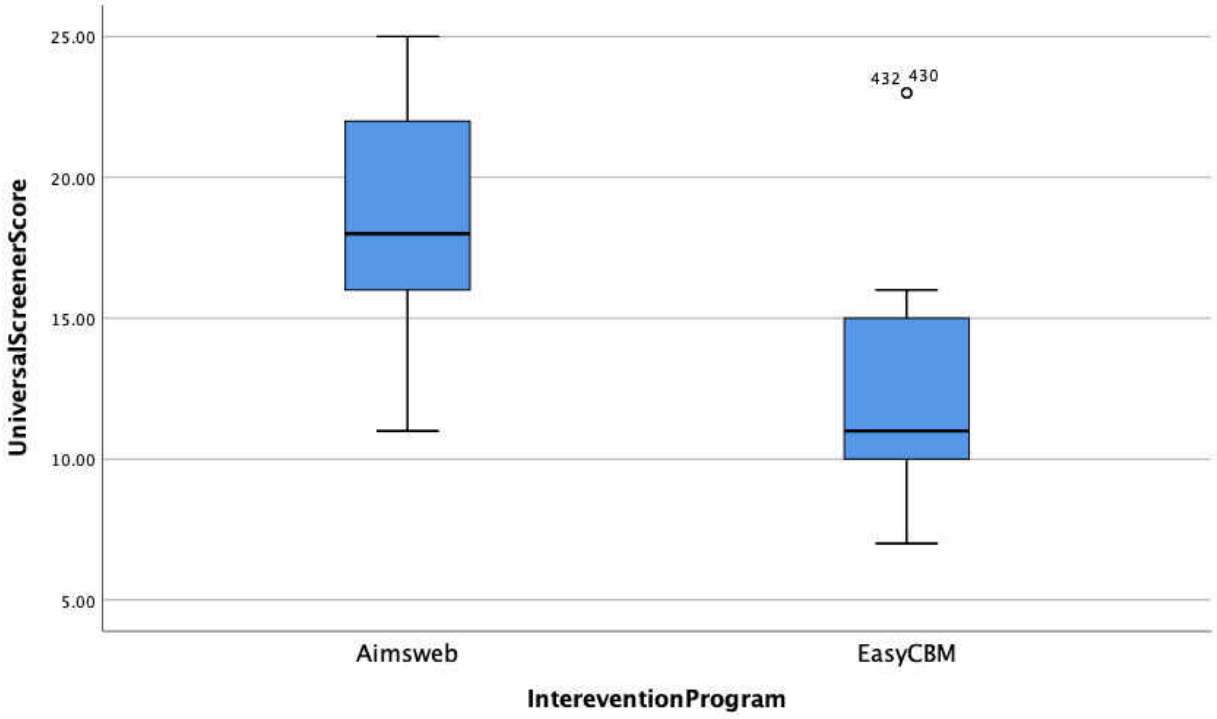
$H_0 1_1$: For Tier 2 students, there is no significant difference in Universal Screener Proficiency math scores between students enrolled in EasyCBM and enrolled in AIMSweb scores.

An independent-samples t-test was conducted to evaluate whether the mean universal screener proficiency Tier 2 math scores were significantly different between students enrolled in AIMSweb and EasyCBM intervention programs. The Universal Screener Proficiency math score was the test value, and the grouping value was AIMSweb or EasyCBM. The test was significant,

t (265) = 13.134, p < .001, significant. Therefore, the null hypothesis was rejected. The η^2 index was .05, which indicated a medium effect size. Tier 2 students enrolled in AIMSweb math intervention (M = 18.52, SD = 4.14) tended to score significantly higher than those students enrolled in Tier 2 EasyCBM math intervention (M = 12.03, SD = 3.12). The 95% confidence interval for the difference in means was 6.49. Figure 2 shows the distributions for the two groups.

Figure 2

Tier 2 Universal Proficiency Math Score Differences in AIMSweb and EasyCBM



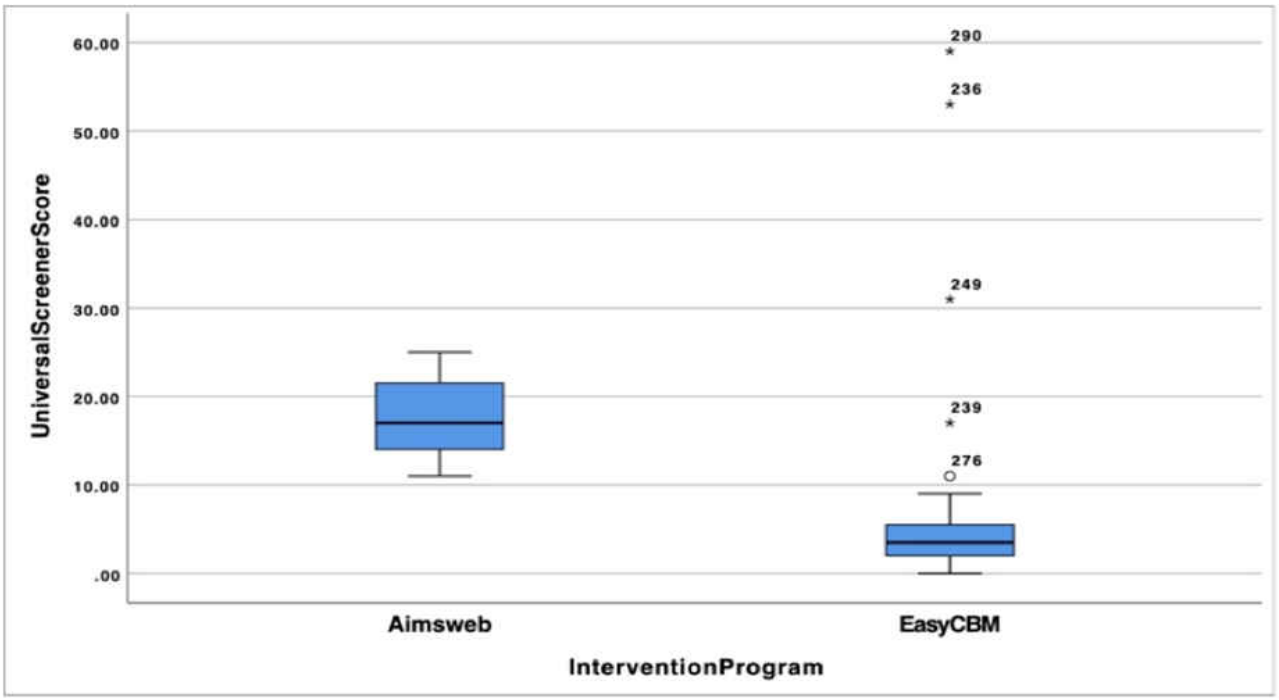
$H_0 1_2$: For Tier 2 students, there is no significant difference in Universal Screener Proficiency reading scores between students enrolled in EasyCBM and students who are enrolled in AIMSweb scores.

An independent-samples t-test was conducted to evaluate whether the mean universal screener proficiency Tier 2 reading scores were significantly different between students enrolled

in AIMSweb and EasyCBM intervention programs. The Universal Screener Proficiency Reading Score was the test value, and the grouping value was AIMSweb or EasyCBM. The test was significant, t (166) = 7.469, p < .001. Therefore, the null hypothesis was rejected. The η^2 index was .05, which indicated a medium effect size. Tier 2 students enrolled in AIMSweb reading intervention (M = 17.64, SD = 4.25) tended to score significantly higher than those students enrolled in Tier 2 EasyCBM reading intervention (M = 7.64, SD = 13.15). The 95% confidence interval for the difference in means was 10.00. Figure 3 shows the distributions for the two groups.

Figure 3

Tier 2 Universal Proficiency Reading Score Differences in AIMSweb and EasyCBM



Research Question 2

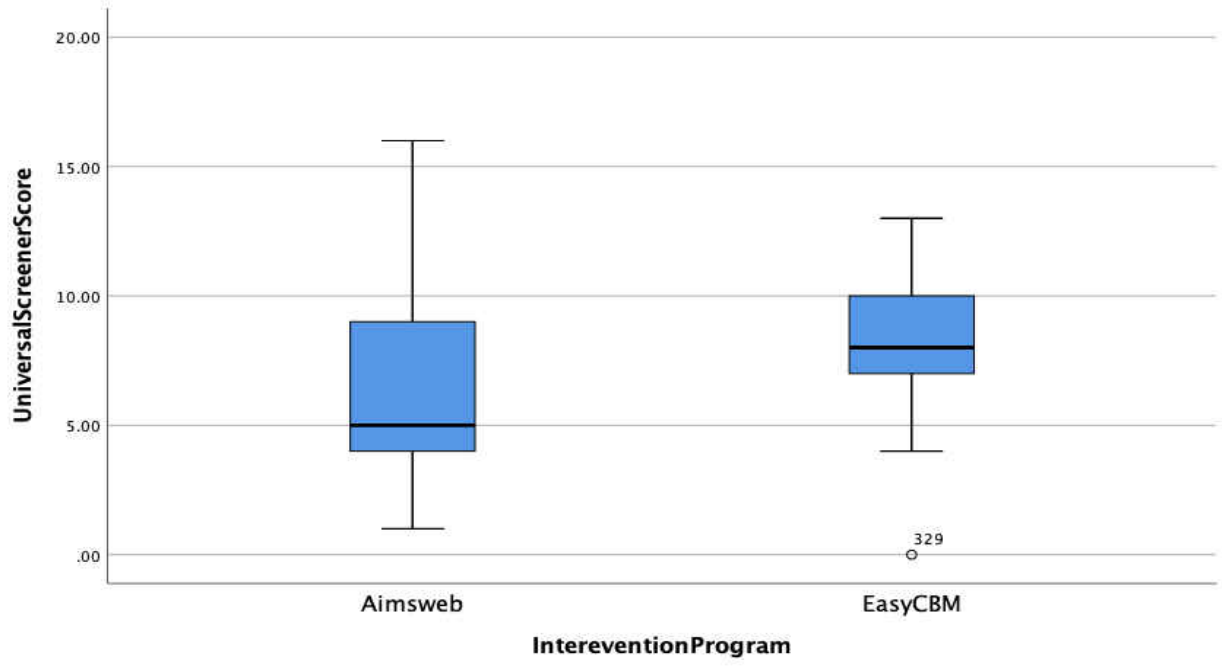
For Tier 3 students, is there a significant difference in Universal Screener Proficiency scores between students enrolled in EasyCBM and students enrolled in AIMSweb scores?

$H_0 2_1$: For Tier 3 students, there is no significant difference in Universal Screener Proficiency math scores between students enrolled in EasyCBM interventions and students enrolled in AIMSweb intervention scores.

An independent-samples t-test was conducted to evaluate whether the mean universal screener proficiency Tier 3 math scores were significantly different between students enrolled in AIMSweb and EasyCBM intervention programs. The Universal Screener Proficiency math score was the test value, and the grouping value was AIMSweb or EasyCBM. The test was significant, t (163) = 3.574, p < .001. Therefore, the hypothesis was rejected. The η^2 index was .05, which indicated a medium effect size. Tier 3 students enrolled in EasyCBM math intervention (M = 5.90, SD = 3.35) tended to score significantly higher than those students enrolled in Tier 3 AIMSweb math intervention (M = 8.15, SD = 2.76). The 95% confidence interval for the difference in means was 2.26. Figure 4 shows the distributions for the two groups.

Figure 4

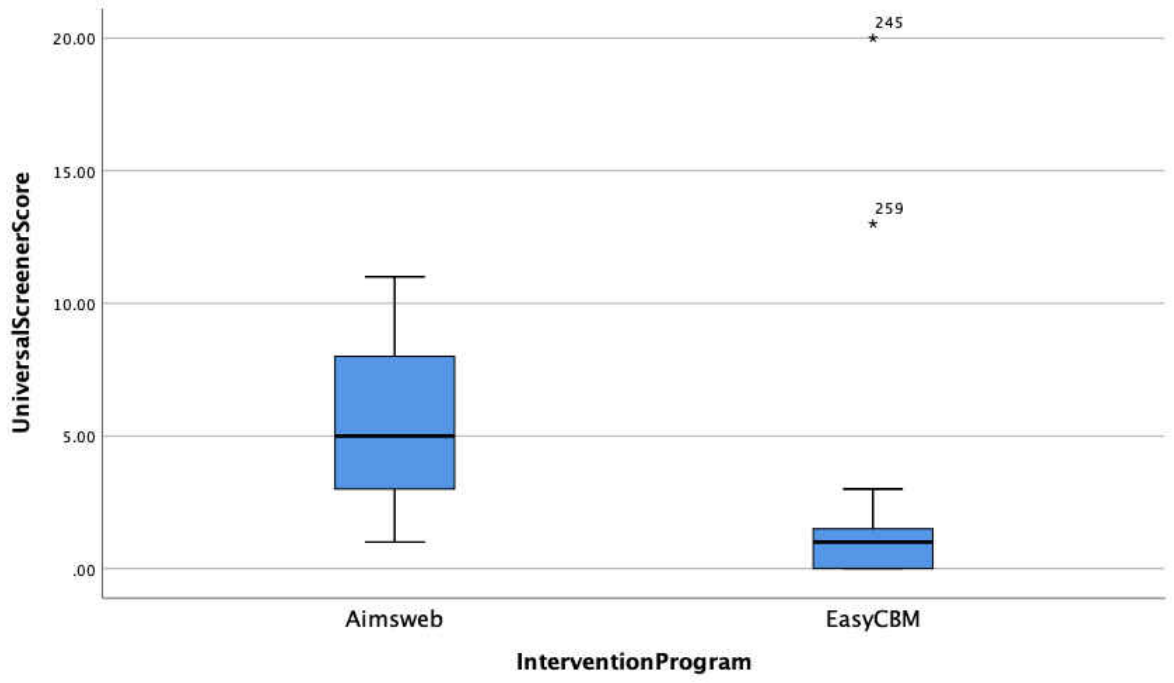
Tier 3 Universal Proficiency Math Score Differences in AIMSweb and EasyCBM



$H_0 2_2$: For Tier 3 students, there is no significant difference in Universal Screener Proficiency reading scores between students enrolled in EasyCBM interventions and students enrolled in AIMSweb intervention scores.

An independent-samples t-test was conducted to evaluate whether the mean universal screener proficiency tier 3 reading scores were significantly different between students enrolled in AIMSweb and EasyCBM intervention programs. The Universal Screener Proficiency reading score was the test value, and the grouping value was AIMSweb or EasyCBM. The test was significant, t (124) = 4.421, p < .001. Therefore, the null hypothesis was rejected. The η^2 index was .05, which indicated a medium effect size. Tier 3 students enrolled in AIMSweb reading intervention (M = 5.41, SD = 2.78) tended to score significantly higher than those students enrolled in Tier 3 EasyCBM reading intervention (M = 2.21, SD = *4.59*). The 95% confidence interval for the difference in means was 2.26. Figure 5 shows the distributions for the two groups.

Figure 5 *Tier 3 Universal Proficiency Reading Score Differences in AIMSweb and EasyCBM*



Research Question 3

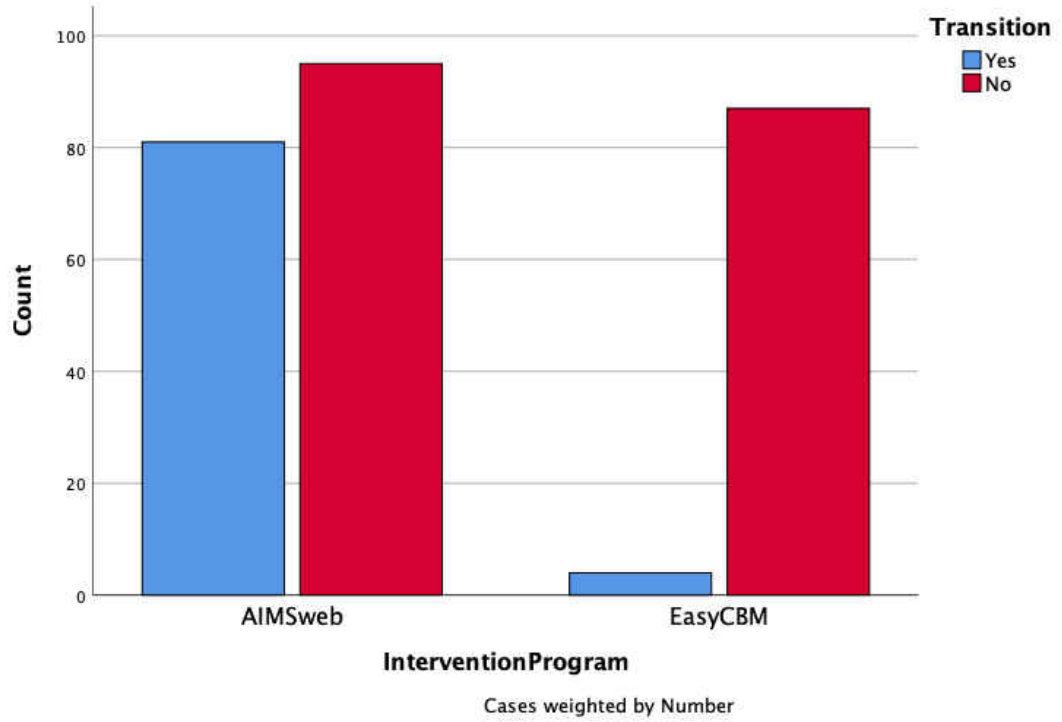
For Tier 2 students, is there a significant difference in the number of students who transition between Tier 2 and Tier 1 instruction enrolled in EasyCBM and students enrolled in AIMSweb?

$H_0 3_1$: For Tier 2 students, there is not a significant difference in the number of students who transition in math between Tier 2 and Tier 1 instruction who are enrolled in EasyCBM and students who are enrolled in AIMSweb.

A two-way contingency table analysis was conducted to evaluate where the proportion of Tier 2 students receiving math intervention who transition to Tier 1 math intervention varies depending on whether they are enrolled in AIMSweb or enrolled in EasyCBM. The two variables are transition (yes or no) and what intervention program they were instructed on (AIMSweb or EasyCBM). Intervention program and transition were found to be significantly related, Pearson X^2 (1, N = 267) = 47.899, p < .001, Cramer's V = .42. Therefore, the null hypothesis is rejected. In general, Tier 2 AIMSweb students are significantly more likely to transition from Tier 2 to Tier 1 from fall to winter than students in EasyCBM. Figure 6 shows the proportion of Tier 2 AIMSweb students transitioning to Tier 1 compared to EasyCBM students transitioning to Tier 1 from fall to winter.

Figure 6

Student Transition from Tier 2 to Tier 1 in Math Intervention



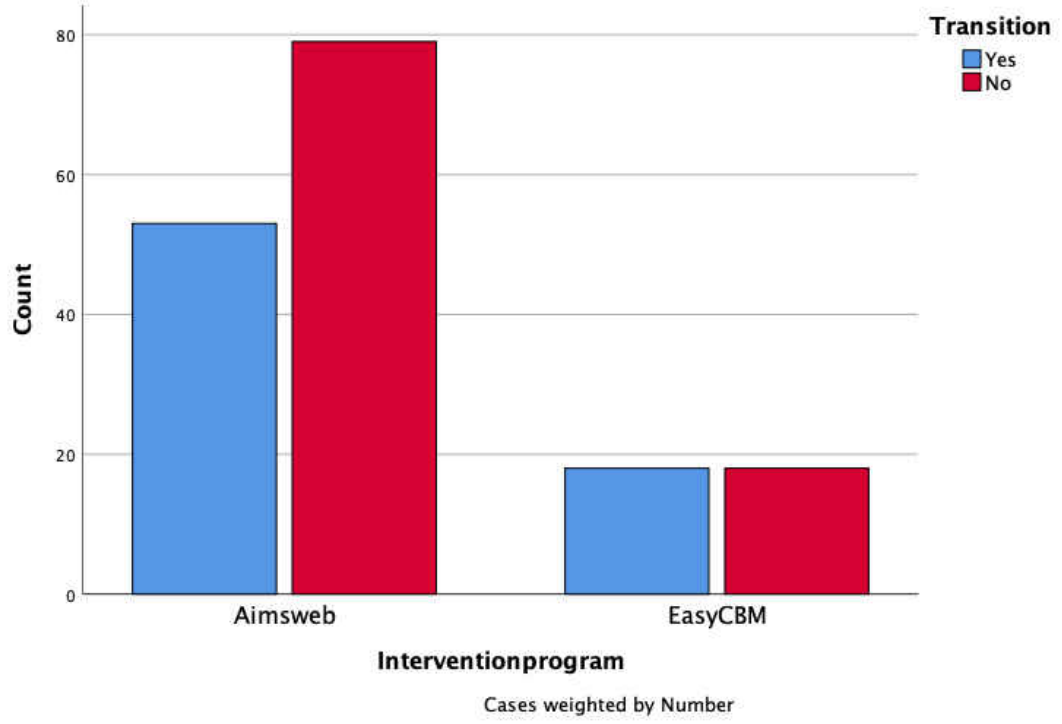
$H_0 3_2$: For Tier 2 students, there is not a significant difference in the number of students who transition in reading between Tier 2 and Tier 1 instruction who are enrolled in EasyCBM and students who are enrolled in AIMSweb.

A two-way contingency table analysis was conducted to evaluate where the proportion of Tier 2 students receiving reading intervention who transition to Tier 1 reading intervention varies depending on whether they are enrolled in AIMSweb or enrolled in EasyCBM. The two variables are transition (yes or no) and what intervention program they were instructed on (AIMSweb or EasyCBM). Intervention program and transition were found to be significantly related, Pearson X^2 (1, N = 168) = 131.117, p < .001, Cramer's V = .88. Therefore, the null hypothesis is rejected. In general, Tier 2 AIMSweb students are significantly more likely to

transition from Tier 2 to Tier 1 from fall to winter than students in EasyCBM. Figure 7 shows the proportion of Tier 2 AIMSweb students transitioning to Tier 1 compared to EasyCBM students transitioning to Tier 1 from fall to winter.

Figure 7

Student Transition from Tier 2 to Tier 1 in Reading Intervention



Research Question 4

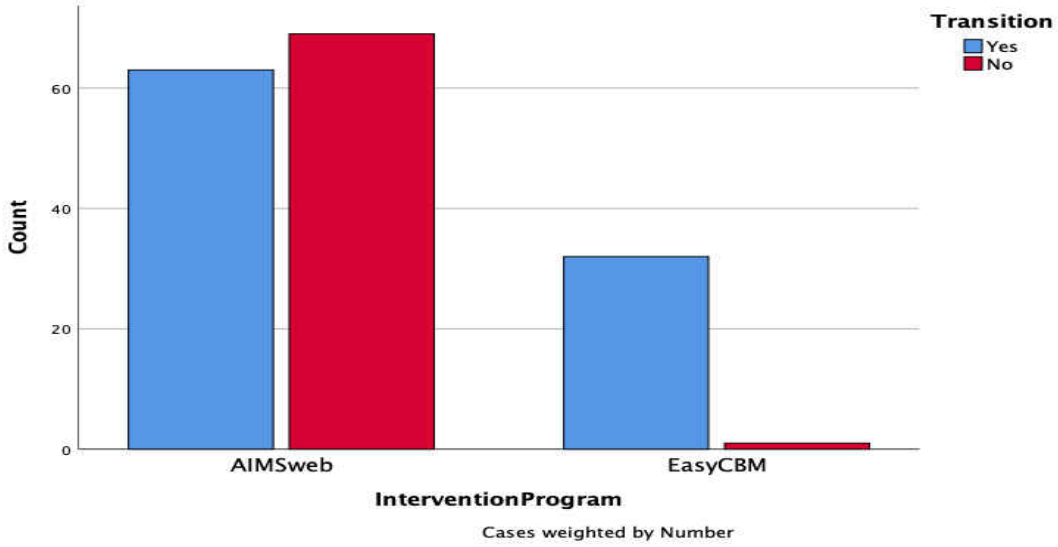
For Tier 3 students, is there a significant difference in the number of students who transition between Tier 3 and Tier 2 instruction enrolled in EasyCBM and students enrolled in AIMSweb?

$H_0 4_1$: For Tier 3 students, there is not a significant difference in the number of students who transition in math between Tier 3 and Tier 2 instruction who are enrolled in EasyCBM and students who are enrolled in AIMSweb.

A two-way contingency table analysis was conducted to evaluate where the proportion of Tier 3 students receiving math intervention who transition to Tier 2 math intervention varies depending on whether they are enrolled in AIMSweb or enrolled in EasyCBM. The two variables are transition (yes or no) and what intervention program they were instructed on (AIMSweb or EasyCBM). Intervention program and transition were found to be significantly related, Pearson X^2 (1, N = 165) = 26.208, p < .001, Cramer's V = 39. Therefore, the null hypothesis is rejected. In general, Tier 3 AIMSweb students are significantly more likely to transition from Tier 3 to Tier 2 from fall to winter than students in EasyCBM. Figure 8 shows the proportion of Tier 3 AIIMSweb students transitioning to Tier 3 compared to EasyCBM students transitioning to Tier 2 from fall to winter.

Figure 8

Student Transition from Tier 3 to Tier 2 in Math Intervention

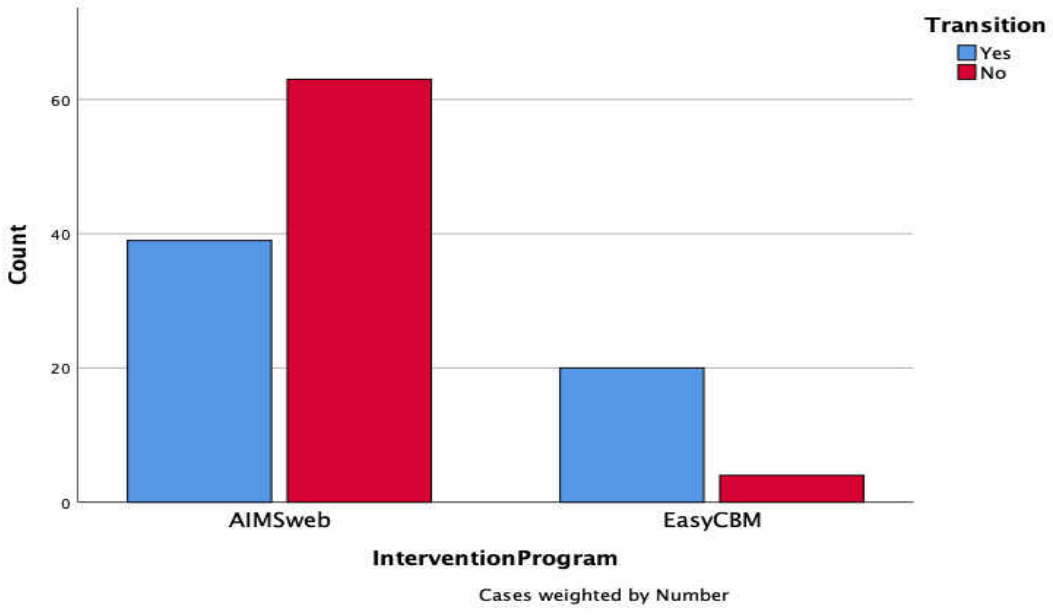


$H_0 4_2$: For Tier 3 students, there is no significant difference in the number of students who transition in reading between Tier 3 and Tier 2 instruction enrolled in EasyCBM and enrolled in AIMSweb.

A two-way contingency table analysis was conducted to evaluate where the proportion of Tier 3 students receiving reading intervention who transition to Tier 2 reading intervention varies depending on whether they are enrolled in AIMSweb or enrolled EasyCBM. The two variables are transition (yes or no) and what intervention program they were instructed on (AIMSweb or EasyCBM). Intervention program and transition were found to be significantly related, Pearson X^2 (1, N = 126) = 15.870, p < .001, Cramer's V = .355. Therefore, the null hypothesis is rejected. In general, Tier 3 AIMSweb students are significantly more likely to transition from Tier 3 to Tier 2 from fall to winter than students in EasyCBM. Figure 9 shows the proportion of Tier 3 AIMSweb students transitioning to Tier 2 compared to EasyCBM students transitioning to Tier 2 from fall to winter.

Figure 9

Student Transition from Tier 3 to Tier 2 in Reading Intervention



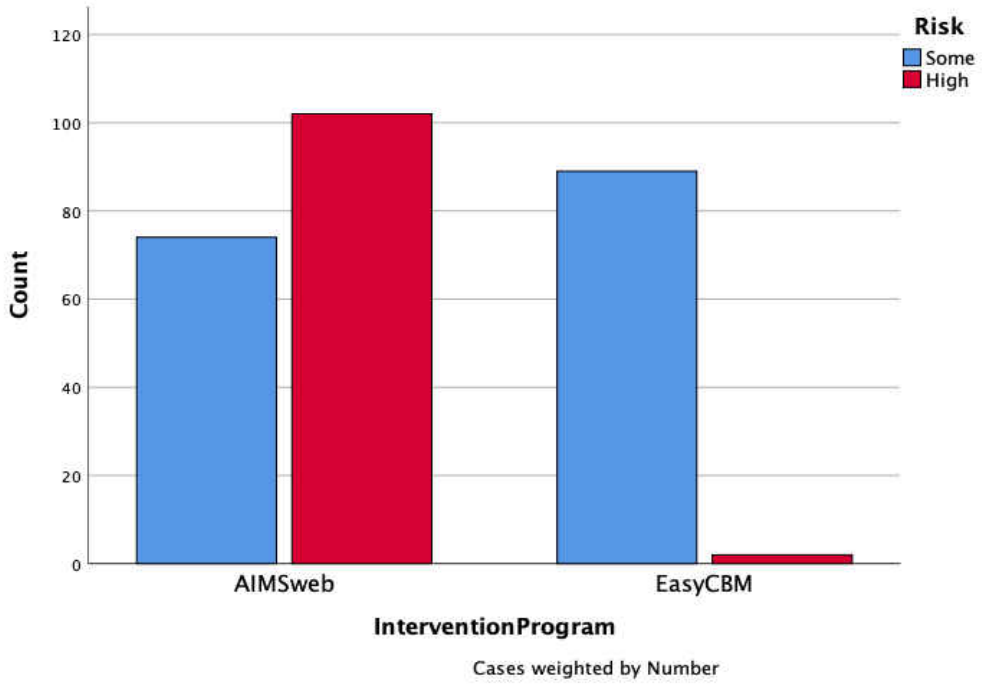
Research Question 5

For Tier 2 students, is there a significant difference in the level of risk indicators (low, some, high) between students receiving intervention in EasyCBM and students receiving intervention in AIMSweb?

$H_0 5_1$: For Tier 2 students, there is no significant difference in math level of risk between students receiving intervention in EasyCBM and students receiving intervention in AIMSweb. A two-way contingency table analysis was conducted to evaluate the significant difference between Tier 2 students receiving math intervention in AIMSweb and EasyCBM. Variables are identified with a level of risk (low, some, high) depending on whether they are universally screened in AIMSweb or universally screened in EasyCBM. The three variables are the level of risk (low, some, high) and what intervention program students were instructed (AIMSweb or EasyCBM). Intervention program and level of risk were found to be significantly related, Pearson X^2 (1, N = 267) = 78.422, p < .001, Cramer's V = .54. Therefore, the null hypothesis is rejected. In general, Tier 2 AIMSweb students are significantly more likely to be identified at high risk from fall to winter than students in EasyCBM. Students are signficncatly more likely to be identified with Some risk if they universally screen with EasyCBM than with AIMSweb. Low-Risk level students were not included in the analysis due to insufficient data. Figure 10 shows the proportion of Tier 2 AIMSweb students at some risk than EasyCBM students identified at some risk.

Figure 10

Students Identified Level of Risk at Some in Tier 2 Math



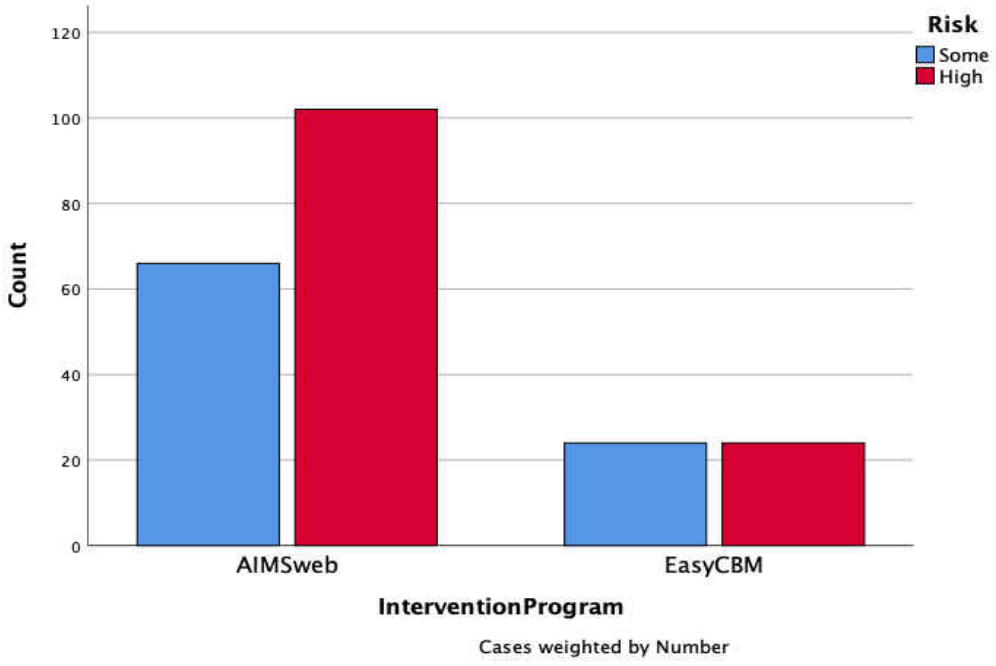
$H_0 5_2$: For Tier 2 students, there is no significant difference in the reading level of risk between students receiving intervention in EasyCBM and students receiving intervention in AIMSweb.

A two-way contingency table analysis was conducted to evaluate the significant difference of Tier 2 students receiving reading intervention in AIMSweb and EasyCBM. Variables are identified with a level of risk (low, some, high) depending on whether they are universally screened in AIMSweb or universally screened in EasyCBM. The three variables are the level of risk (low, some, high) and what intervention program students were instructed (AIMSweb or EasyCBM). Intervention program and level of risk were found to be significantly related, Pearson $X^2(1, N = 168) = 190.40$, $p < .001$, Cramer's V = 75. Therefore, the null hypothesis is rejected. In general, Tier 2 AIMSweb students are significantly more likely to be

identified at high risk from fall to winter than students in EasyCBM. Students are significantly more likely to be identified with some risk when universally screened with AIMSweb than with EasyCBM. Low-Risk level students were not included in the analysis due to insufficient data. Figure 11 shows the proportion of Tier 2 AIMSweb students at some risk than EasyCBM students identified at some risk.

Figure 11

Students Identified Level of Risk at Some in Tier 2 Reading



Research Question 6

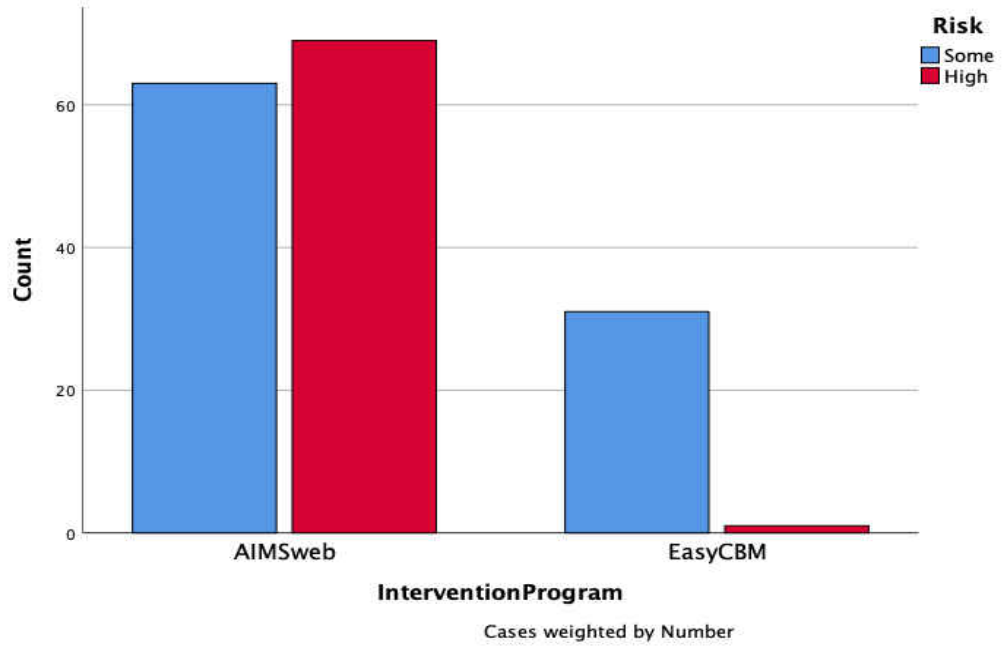
For Tier 3 students, is there a significant difference in the level of risk indicators (low, some, high) between students receiving intervention in EasyCBM and students receiving intervention in AIMSweb?

$H_0 6_1$: For Tier 3 students, there is no significant difference in math levels of risk scores between students receiving interventions in EasyCBM and students receiving interventions in AIMSweb.

A two-way contingency table analysis was conducted to evaluate the significant difference between Tier 3 students receiving math intervention in AIMSweb and EasyCBM. Variables are identified with a level of risk (low, some, high) depending on whether they are universally screened in AIMSweb or universally screened in EasyCBM. The three variables are the level of risk (low, some, high) and what intervention program students were instructed (AIMSweb or EasyCBM). Intervention program and level of risk were found to be significantly related, Pearson X^2 (1, N = 164) = 25.430, p < .001, Cramer's V = .40. Therefore, the null hypothesis is rejected. In general, Tier 3 AIMSweb students are significantly more likely to be identified at high risk from fall to winter than students in EasyCBM. Students are significantly more likely to be identified with high risk when universally screened with AIMSweb than EasyCBM. Low-Risk level students were not included in the analysis due to low sample sizes. Figure 12 shows the proportion of Tier 3 AIMSweb students at high risk than EasyCBM students identified at high risk.

Figure 12

Students Identified Level of Risk at High in Tier 3 Math



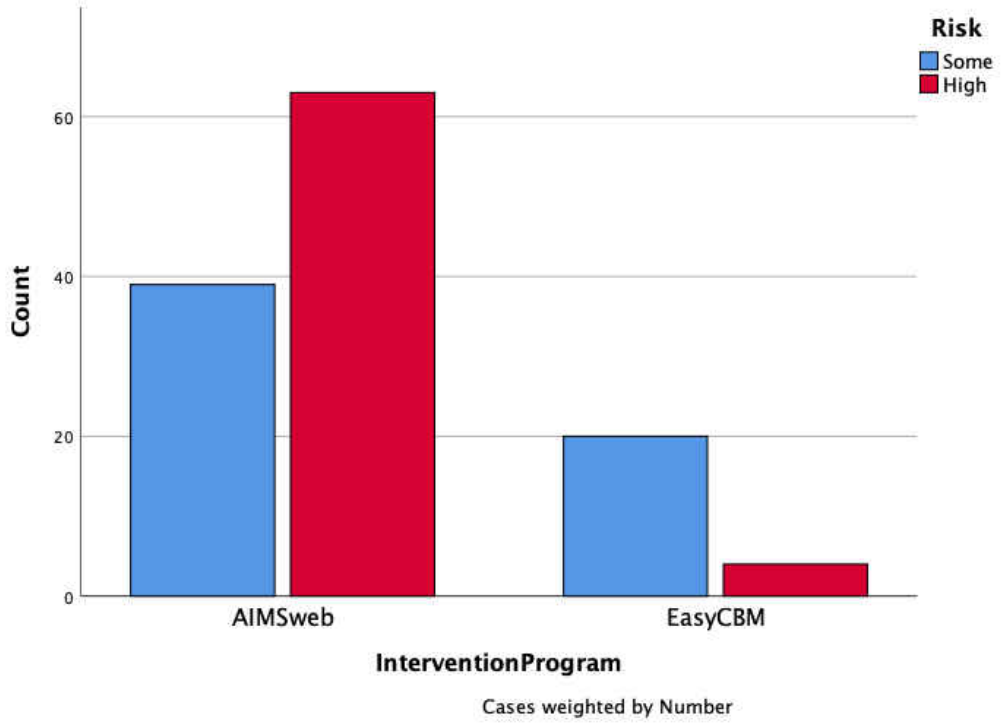
$H_0 6_2$: For Tier 3 students, there is not a significant difference in reading levels of risk scores between students who are receiving interventions in EasyCBM and students who are receiving interventions in AIMSweb

A two-way contingency table analysis was conducted to evaluate the significant difference of Tier 3 students receiving reading intervention in AIMSweb and EasyCBM. Variables are identified with a level of risk (low, some, high) depending on whether they are universally screened in AIMSweb or universally screened in EasyCBM. The three variables are the level of risk (low, some, high) and what intervention program students were instructed (AIMSweb or EasyCBM). Intervention program and level of risk were found to be significantly related, Pearson X^2 (1, N = 126) = 15.870, p < .001, Cramer's V = .36. Therefore, the null hypothesis is rejected. In general, Tier 3 AIMSweb students are significantly more likely to be identified at high risk from fall to winter than students in EasyCBM. Students are significantly

more likely to be identified with high risk when universally screened with AIMSweb than EasyCBM. Low-risk students were not included in the analysis due to low sample sizes. Figure 13 shows the proportion of Tier 3 AIMSweb students at high risk than EasyCBM students identified at high risk.

Figure 13

Students Identified Level of Risk at Some in Tier 3 Reading



Chapter Summary

This chapter presented the analysis of the significant differences residing the implementation of intervention programs using AIMSweb and EasyCBM in Tier 2 and Tier 3 academic levels of both math and reading instruction during the 2018 and 2019 school year. Six research questions and ten corresponding null hypotheses guided the research. Demographic data on the sample population were also presented. A series of independent samples t-test was

conducted to evaluate the mean difference in Tier 2 and Tier 3 level scores for both intervention programs in math and reading for Research Questions 1 and 2. A series of chi-square analysis was used to evaluate the Research Questions 3 through 6. From these tests, all null hypotheses were rejected. The significant difference between the universal screener scores and the risk analysis level is distinct. Each program provided evidence of student growth through universal screener scores. When all significant risk variables were examined, both programs presented with both "some" and "high" levels of risk, with AIMSweb identification being significantly higher. For Research Question 6, statistical analysis could not be presented with a high confidence level due to the low-frequency levels reported in the data. A summary of these findings and conclusions, implications, and recommendations for future research are presented in Chapter 5.

Chapter 5. Summary and Recommendations

Response to intervention programs for high school grade levels 9 through 10 continue to be supported and practiced as an academic intervention for reading and math for students identified as at risk. This quantitative study was conducted to determine if significant differences may lie between the two-state recommended programs (AIMSweb and EasyCBM) when applied to student academic assessment. Universal Screener proficiency scores and at-risk indicators were coupled with grade level and tier placement for intervention. Participants were asked to provide data from the 2018 and 2019 school years. This data also included the fall and winter screener data. Contact was achieved with eight high schools from the upper east Tennessee region. Permission to collect data was granted by six of the eight schools asked to participate. Seven hundred twenty-six data points were received from six high schools between two school districts. Four of the schools produced reports from AIMSweb that included composite universal screener scores for each school's fall and winter for grades nine and ten, which included a tiered breakdown of students at Tier 2 and 3 levels the areas of reading and math. These reports also included the students' at-risk levels. Student names and school names had been redacted from the reports. School reports were organized by grade and academic area. Each school reporting for AIMSweb had four sets of reports.

EasyCBM data consisted of two high schools. Two schools incorporating EasyCBM for intervention produced excel reports with composite scores for reading and math. Reports were organized by school and grade level. Risk levels were included in the EasyCBM, and AIMSweb reports. Universal screening data coincided with fall and winter reports for both programs. Student identifiers such as name and birthday were redacted before receiving the reports. Each student had an assigned number and was sorted by grade level and tier level.

Findings presented significant differences in the universal screener scores and tier movement of individual student data from the fall to winter between AIMSweb and EasyCBM. AIMSweb scores tended to provide more tier movement and tended to provide more specifics about skill level achievement. AIMSweb reports also displayed benchmarking data and projected growth data that was more easily understood over EasyCBM. EasyCBM reports included checkpoint data snapshots of student improvement throughout the fall and winter but did not include student projection data. (Alsalamah, 2017). Professional development procedures guide educators in making decisions about students, and such decision-making is considered the core process in every RTI model. Our rationale is that technology can help schools more efficiently use staff, collect data, provide individualized instruction to struggling learners, and— perhaps most important—potentially entice struggling adolescents to become more engaged with remedial instruction (King et al., 2012).

Research Questions and Findings

Research Question 1

Research Question 1 examined the difference in universal screener scores between tier 2 students enrolled in EasyCBM and students enrolled in AIMSweb. Analysis of the data provided by the universal screener scores indicated that significant differences in intervention program scoring for Tier 2 students exist between AIMSweb and EasyCBM. Both intervention programs identify the bottom 20% of students for Tier 2 and the bottom 10% for Tier 3. More students were identified appropriately using the M-CAP math comprehension screener in AIMSweb than using the CCCS for math comprehension screening in EasyCBM. More students were identified appropriately using the MAZE comprehension screener in AIMSweb using the Passage Reading

Fluency (PRF) screening in EasyCBM. (Ridgeway et al., 2012) and Gardner, 2011) support that a screening process that more accurately identifies students' needs allows for the more appropriate recommendation for intervention measures. Steady tier progression through progress monitoring was observed from the AIMSweb data in contrast to the EasyCBM data.

Research Question 2

Analysis of the data provided by the universal screener scores indicated that significant differences in intervention program scoring for Tier 3 students exist between AIMSweb and EasyCBM. Simultaneously, both intervention programs identify the bottom 20% of students for Tier 2 and the bottom 10% for Tier 3. More students were identified appropriately using the M-CAP math comprehension screener in AIMSweb than using the CCCS for math screening in EasyCBM. More students were identified appropriately using the MAZE comprehension screener in AIMSweb than using the PRF for screening in EasyCBM. Fuchs and Fuchs (2015), Murphy (2016), and Cowen and Maxwell (2016) support the idea that an intervention program that mor accurately identifys students' needs allows for more appropriate recommendation for intervention measures. Steady tier progression through progress monitoring was observed from the AIMSweb data in contrast to the EasyCBM data.

Research Question 3

Research Question 3 examined the difference in the number of students whom transition between Tier 2 and Tier 1 instruction enrolled in EasyCBM and students enrolled in AIMSweb. Previous research by Alonzo (2016), Hosp et al., (2011), and Stevenson (2017) suggests that steady application of interventions and frequent benchmarking allows for steday teir progression. The test results showed a significant difference in tier movement from Tier 2 to Tier 1 for AIMSweb to EasyCBM. AIMSweb presented more tier movement from Tier 2 to Tier 1 than

EasyCBM. EasyCBM tended to have students remain within Tier 2 for a more extended time, and little evidence for a change in score was evident over the fall to winter. This evidence would question why students were not progressing through the tiers. The presumption being they are not receiving the interventions explicitly targeted for their needs and the program is not identifying their needs correctly.

Research Question 4

Results showed significant differences in the number of students who transition between Tier 3 and Tier 2 depending on which intervention program they were enrolled. Chi-square analysis indicated, whether in ninth or tenth grade, maintained proportional levels of transition between the tier levels per intervention program. Gardner (2011) and Gresham and Little (2012) support Tier 3 students receiving the most rigorous and time intensive interventions for maximum effectiveness. A majority of the students remained in AIMSweb Tier 3 intervention, indicating they were receiving more specific interventions for more extended periods than those in EasyCBM. This data seemingly supports the rationale that tier level identification and retention supports the mandated bottom 10% of students identified using AIMSweb are receiving appropriate interventions at grade level. The likelihood of a student receiving tier intervention for a more extended period with AIMSweb is higher than with EasyCBM.

Research Question 5

Research Question 5 examined the difference in the level of risk indicators (low, some, high) between Tier 2 students receiving intervention in EasyCBM and students receiving intervention in AIMSweb. Results showed significant differences in the number of students identified at some risk in tandem with students identified as tier two between AIMSweb and EasyCBM. Fuchs and Fuchs (2005) and Alonzo (2016) both agree that targeted interventions

derived from data-based decisions about student need were imperative to the success of interventions programs. Universal screeners score tended to be more closely aligned to the level of risk in AIMSweb than EasyCBM, where students at some risk level were more closely aligned with tier three levels but still identified at some risk. Similarly, this remained true for reading and math areas and grades 9 and 10.

Research Question 6

Research Question 6 examined the difference in the level of risk indicators (low, some, high) between Tier 3 students receiving intervention in EasyCBM and students receiving intervention in AIMSweb. Results showed a significant difference in risk indicators and students identified in tier three. However, the sample size of Tier 3 students identified in EasyCBM was below the threshold to provide strong evidence supporting the identified significant difference. Universal screener scores identifying students in tier three enrolled in the AIMSweb intervention program were more aligned with the identified risk level than those enrolled in EasyCBM. EasyCBM sample sizes for winter benchmarks were small, and data were inconclusive for the analysis's strength. Analysis for both reading and math at the Tier 3 level yielded similar results.

Recommendations for Practice

This study's results are consistent with previous research suggesting that intervention program implementation has a positive effect on student peformance. With previous research supporting a regularly scheduled intervention program addressing students' specific needs as necessary to help students falling behind, evidence supporting a unified system of tracking student progress for the state of Tennessee is needed. Therefore, it is imperative to train teachers and administrators on the impacts of a system that properly helps teachers provide intervention

for students at risk. Training reduces the number of students misidentified when transferring from one school system to another and one intervention program. In doing so, it is recommended that:

1. In order to more effectively provide consistent intervention for students at risk, an intervention program must be selected that provides an accurate picture of student needs. A unified approach under the umbrella of one intervention program would allow for more accurate and effective intervention delivery. Unifying the approach would allow students who transition from one system to another to receive more consistent, actionable interventions and allow that student to progress through the tiers and get back on track academically.
2. Various intervention programs should be explored to provide interventionists with the tools they need to provide academic support that addresses student needs more effectively. When selecting an intervention program, this should be an intentional focus area. In the current pandemic-laden landscape of education, it is expected that intervention will be of the utmost priority for school systems working to close educational gaps due to school closures for extended periods. Identifying students for intervention more accurately is not guaranteeing that students will progress with intervention. Identifying specific needs for each student and providing intervention by narrowing the scope and sequence of their needs should be prioritized when selecting an intervention program.
3. As educators, we must seek more effective ways to provide interventions for our students that are at risk academically. Recommendations for a regional caucus to examine

how unifying intervention screening and progress monitoring programs can help interventionists provide services to students.

4. It is also recommended that district level leaders address regional issues and that the RTI program can address gaps in student instruction. Regional collaboration would allow for more ease of transition for students in transition and boost regional effectiveness and efficiency when addressing student's needs identified as at risk. Opportunities through regional director weekly calls present good opportunities for discussion. Discussion may also take place at the program director level.

Recommendations for Further Research

Further research in this area may focus on the following:

1. Transient students and focus on addressing their needs through intervention. With the implementation of teacher interventions in mind, another question to be explored is how the Response to Intervention 2 program is being implemented across the state and how much consistency between each program's applications is present within Core Region. In speaking with school-level interventionists, the students who benefitted from the intervention were those students in the transition from other school systems and those identified as English Language Learners.

   It is believed that much more information about program effectiveness can be gained through conversations with interventionists and teachers, and students. Therefore, a qualitative nature study may help answer some of these questions. Finding what features educators feel is most effective in addressing student deficit areas may

benefit program development. These discussions would help mitigate the amount of instructional time lost in reassessment when moving from one CBM to another.

Summary

When the State of Tennessee first introduced information about how RTI would look in secondary education, much of the framework of how it would function, and look was left up to the individual school districts regarding how it would operate within their system. Academic needs and state-level data compared to national norms showed a need to address reading and math areas. The state did stipulate that no extra funding would be provided but did allow the local districts to implement the new requirements as they saw fit within the framework's broad outline. AIMSweb and EasyCBM were selected as the two systems where a district could gather empirical data. Many school systems took the general outlines and formed a basic intervention program to identify at-risk students. The state provided professional development opportunities, but many educators argued that the RTI model implemented in the lower grade levels would not function the same at the secondary levels. Response to intervention programs at the secondary level would function but had to do so among students needing graduation credits and study programs. At the beginning of RTI implementation, all grade levels (9 through 12) were required to universally screen students to accurately picture the bottom 20% academically in reading and math.

The Tennessee Department of Education recommended EasyCBM and AIMSweb for this purpose due to their ability to track and report student growth and make intervention recommendations. At the time, EasyCBM was an open-source program developed by the University of Oregon and available online for free. AIMSweb plus was developed by Pearson

Assessments and was available to purchase a fee per child or a district-level subscription. During that time, both programs could identify areas of need. Some school districts chose to use the tandem programs, using one for universal screening and the other for progress monitoring and vice versa. Reasons for choosing one program over the other are various, and it would be recommended as a topic for further study. General implementation for all grade levels required that universal screenings be performed three times a year. Data acquisition for that many students three times a year proved to be a daunting task at best. The state began getting feedback from school districts about the implementation at the high school level, and revisions in RTI implementation for secondary levels were proposed and adopted. Universally screening all students was no longer needed. Students on track to graduate with acceptable grades were excluded from screening. Two grade levels were selected (ninth and tenth grade) for screening, which would occur at the end of the school year. An early warning system was implemented to identify students at risk by looking at their assessment, attendance, and behavior histories. These composite scores coupled with universal screening scores either recommended intervention or not. Ultimately, the RTI lead interventionists and guidance counselors, and administrators decided to receive interventions. Although the state requires universal screenings to occur at the end of the year, many schools still choose to screen at the beginning of the academic year. The framework application adjustment allowed for a more accurate picture of student needs and enabled interventionists to focus their most needed efforts.

Based on the totality of findings, AIMSweb is the recommened tool for the purposes of universally screening and progress monitoring students if one program had to be selected for RTI2. As stated before, intervention at it's core is effective due to the nature of causing a change in a student's academic path. Therefore, intervention tools such as AIMSweb and EasyCBM are

benifical in helping make gains in students' achievement academically. With that being said, one must remeber the the human element makes the most difference in a student's academic achievement. It should be noted that this study focused on the tools and not the human element of data-based decision making for intervention. The findings of this study, in favor of AIMSweb, showed more alignment of universal screening scores to level of risk when identifying the needs of the individual student. Better alignement of universal screener and progress monitoring scores to level of risk allow for more accurate data-based instruction interventions to take place.

As we have moved forward, school districts are now in the eighth year of implementation. Many school systems have moved to a one-to-one device structure for student instruction. With students having their own devices, systems have gone farther than just using AIMSweb or EasyCBM to identify students in need. Many are using new CBM's in combination, that track and project student growth and allow for even more individualized instruction by constantly adjusting lessons to fit students' abilitities. These advances in intervention application should be noted and expanded moving forward.

References

Ables, C., Coulter, A., Dold, S., Duggin, N.Y., Gerrell, N., Gilbert, M., Hodak, T., Holt, A., Hyde, M., King, S., Koehler, J., Maynard, J., Nicholls, J., Paczak, H., Pasternack, R.H., Roberson, S., Sexton, J., Shelton, T., Shinn, M.R.,.… Shroyer, S., Travis, N., & Woehler, C., (2016). RTI2 framework: Response to instruction and intervention framework Tennessee Department of Education. http://www.tn.gov/assetts/entitieseducation/rti2/attachments/rti2 implementation_guide.pdf

AIMSweb. (2012a). *AIMSweb ROI growth norms*. Pearson.

Albritton, K., & Truscott, S. (2014). PD to increase problem-solving skills in a response to intervention framework. *Contemporary School Psychology* 18(1), 44. doi:10.1007/ s40688-013-0008-0

Alonzo, J. (2016). The relation between easyCBM and Smarter Balanced Reading and mathematics assessments. *Journal of School Administration Research and Development*, 1(1), 17-35.

Alsalamah, A. (2017). The effectiveness of providing reading instruction in Tier 2 of Response to Intervention. *International Journal of Research in Humanities & Soc. Sciences*, 5(3), 6-17.

Ardoin, S. P., & Daly, E. J., III. (2007). Introduction to the special series: Close encounters of the instructional kind - How the instructional hierarchy is shaping instructional research 30 years later. *Journal of Behavioral Education*, 16(1), 1-6. doi:10.1007/210864-006-9027-5

Balu, Rekha, P,Zhu, F. Doolittle, E.Schiller, J.Jenkins, & R.Gersten (2015). Evaluation of Response to Intervention Practices for elementary school reading (NCEE 2016). National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education.

Batsche, G. M., Elliott, J., Graden, J., Grimes, J., Kovaleski, J. F., & Prasse, D. (2005). *Response to intervention: Policy considerations and implementation*. National Association of State Directors of Special Education.

Brady, S., & Moats, L. C. (1997, spring). Informed instruction for reading success: Foundations for teacher preparation. In *Perspectives: A position paper of the International Dyslexia Association*. International Dyslexia Association.

Brozo, W. G. (2009). Response to intervention or responsive instruction? Challenges and possibilities of response to intervention for adolescent literacy. *Journal of Adolescent & Adult Literacy*, 53(4), 277-281.

Burns, M. K. (2009, March 18). Using technology to enhance RTI implementation. National Center for Learning Disabilities, Inc.,

Bryant, D. P., Hartman, P., & Kim, S. A. (2003). Using explicit and strategic instruction to teach division skills to students with learning disabilities. *Exceptionality,* 11(3), 151-164.

Carver, R. P. (1998). Predicting reading level in grades 1 to 6 from listening level and decoding level: Testing theory relevant to the simple view of reading. *Reading and Writing: An Interdisciplinary Journal*, 10(2), 121–154.

Christ, T. J., Scullin, S., Tolbize, A. & Jiban, C. L. (2008). Curriculum-Based Measurement of Math Computation. *Assessment for Effective Intervention,* 33(4), 198-205.

Clarke, B., Cary, M.G.S., Shanley, L., & Sutherland, M. (2018). Exploring the Promise of a Number Line Assessment to Help Identify Students At-Risk in Mathematics. *Assessment for Effective Intervention*, 1(1), 1-10.

Codding, R. S., Hilt-Panahon, A., Panahon, C. J., & Benson, J. L. (2009). Addressing mathematics computation problems: A review of simple and moderate-intensity interventions. *Education and Treatment of Children*, 32(2), 279-312.

Colorado Department of Education (CDE). (2020, September 3rd). *Educators CDE.* Retrieved from Colorado Department of Education https://www.cde.state.co.us/accountability/aims_web_assessment_instrument_description_2018

Cowan, C., & Maxwell, G. (2105). Educators' perceptions of Response to Intervention implementation and impact on student learning. *Journal of Instructional Pedagogies.* 16(1), 1-11.

Deeney, T.A., & Shim, M.K. (2016). Teachers' and students' views of reading fluency: Issues of consequential validity in adopting one-minute reading fluency assessments. *Assessment for Effective Intervention,* 4(2), 109-126.

DeLoach, D., & Woodason, J. (2017). Educator perceptions of response to intervention (Order No. 10685539). Available from ProQuest One Academic; Social Science Premium Collection. (1978090929). Retrieved January 24, 2020 from https://eric.ed.gov/?id=ED581967

Deno, S. (1985). Curriculum-based measurement: The emerging alternative. *Exceptional Children,* 52, 219–232. doi:10.1177/001440298505200303

Elliott, S. N., Kurz, A., Tindal, G., & Yel, N. (2017). Influence of opportunity to learn indices and education status on students' mathematics achievement growth. *Remedial and Special Education,* 38(3), 145-158.

Fanning, E. (2016). Examination of the impact of students' skill levels on the effectiveness of evidence-based interventions for improving mathematics fluency. CUNY Academic Works. https://academicworks.cuny.edu/gc_etds/1299

Filderman, M. J., Toste, J. R., Didion, L. A., Peng, P., & Clemens, N. H. (2018). Data-based decision making in reading interventions: A synthesis and meta-analysis of the effects for struggling readers. *The Journal of Special Education*, 52(3), 174-187.

Fleming, J. (2017, August 8). *12 common questions parents ask about MAP Growth*. Retrieved from NWEA: www.nwea.org

Fletcher, J. M., & Vaughn, S. (2009). Response to Intervention: Preventing and remediating academic difficulties. *Child Development Perspectives*, *3*(1), 30–37. doi:10.1111/j.1750-8606.2008. 00072.x

Foegen, A., Jiban, C., & Deno, S. (2007). Progress monitoring measures in mathematics: A review of the literature. *The Journal of Special Education*, 41(2), 121–139.

Ford, J. W., Conover, S. J., Lembke, E. S., Smith, R. A., & Hosp, J. L. (2018). A comparison of two content area curriculum-based measurement tools. *Assessment for Effective Intervention,* 43(2), 121-127.

Fuchs, L. S., & Fuchs, D. (2012). Using CBM for Progress Monitoring in Reading. U.S. Office of Special Education Programs, 1(1), 1-76.

Fuchs, D., & Fuchs, L. (2015). Rethinking service delivery for students with significant learning problems: Developing and implementing intensive instruction. *Remedial and Special Education*, *36*, 105–111.

Fuchs, D., & Fuchs, L.S. (2005). Responsiveness-To-Intervention: A blueprint for practitioners, policymakers, and parents. Teaching Exceptional Children, 38(1), 57-61.

Fuchs, L. S., Fuchs, D., & Malone, A. S. (2017). The taxonomy of intervention intensity. *Teaching Exceptional Children*, 50(4), 35–43.

Fuchs, D., Fuchs, L. S., & Compton, D. L. (2012). Smart RTI: A next-generation approach to multilevel prevention. *Exceptional Children*, 78(3),263-279.

Fuchs, L. S., Fuchs, D., Compton, D. L., Powell, S. R., Seethaler, P. M., & Capizzi, A. M. (2006). The cognitive correlates of third-grade skill in arithmetic, algorithmic computation, and arithmetic word problems. *Journal of Education Psychology*, 98(1), 29-43.

Fuchs, D., Fuchs, L.S., & Hamlett, C. L. (1994). Strengthening the connection between assessment and instructional planning with expert systems. *Exceptional Children*, 61, 138-146.

Garcia, T. (2007, January 17). Facilitating the Reading Process: A Combination Approach. *Teaching Exceptional Children*, pp. 12-17. Retrieved from https://doi.org/10.1177%2F004005990703900302

Gardner, T. J. (2011). Disabilities in written expression. *Teaching Children Mathematics, 18*(1), 46-54. doi:10.5951/teacchilmath.18.1.0046

Germann G., & Tindal, G. (1985). An application on curriculum-based assessment: The use of direct and repeated measurement. *Exceptional Children,* 52*,* 244–265.

Gertsen, R., & Chard, D. (1999). Number sense: Rethinking arithmetic instruction for students with mathematical disabilities. *Journal of Special Education,* 33(1), 18 -28.

Ghassemieh, B. (2017). *An exploratory case study of teachers' perceptions of RTI professional development on data-based decision making* (Order No. 10624500). Available from ProQuest One Academic; Social Science Premium Collection. (1965531466). Retrieved January 24, 2020 from https://www.proquest.com/openview/ebe790560431eba8d945ba569855c353/1?pq-origsite=gscholar&cbl=2026366&diss=y

Gladson, A., Looney, G., & Luna, J. (2017). *A study of the effectiveness of literacy interventions on middle and high school students* (Order No. 10639280). Available from ProQuest One Academic; Social Science Premium Collection. (1972135963). Retrieved January 24, 2020 from https://login.iris.etsu.edu:3443/

Good, R., & Kaminski, R. (Eds.). (2002). *Dynamic Indicators of Basic Early Literacy Skills (6th ed.)*. Institute for the Development of Educational Achievement.

Gresham, G. & Little, M. (2012). RtI in Math Class. *Teaching Children Mathematics, 19*(1), 20-29. doi:10.5951/teacchilmath.19.1.0020

Hall, C, & Mahoney, J (2013). Response to Intervention: Research and Practice. *Contemporary Issues in Education Research*, 6(3), 273-278.

Hamilton, L., Halverson, R., Jackson, S. S., Mandinach, E., & Supovitz, J.A. (2009). *Using student achievement data to support instructional decision making*. U.S. Department of Education. Retrieved June 21, 2020 from https://ies.ed.gov/ncee/wwc/Docs/PracticeGuide/dddm_pg_092909.pdf

Hanover Research. (2013). Retrieved December 14, 2019, from https://www.readkong.com/page/review-of-k-12-literacy-and-math-progress-monitoring-tools-8120397

Hensley, K. K. (2015). "Examining the effects of paper-based and computer-based modes of assessment on mathematics curriculum-based measurement." PhD (Doctor of Philosophy) thesis, University of Iowa, 2015. https://ir.uiowa.edu/etd/1627/

help.easycbm.com. (2021). Retrieved from https://help.easycbm.com/wp-content/uploads/2016/01/easyCBM-Teacher-Users-Deluxe-Users-Manual.pdf

Hicks, A. D., Hodges, T. E., & Rose, T. D. (2012). Interviews as RtI Tools. *Teaching Children Mathematics, 19*(1), 30-36. doi:10.5951/teacchilmath.19.1.0030

Horne, J. E. (2017). *Secondary teachers' description of their role in the implementation of the Response to Intervention model* (Order No. 10275780). Available from ProQuest One Academic. (1901899019). Retrieved January 24, 2020 from https://login.iris.etsu.edu:3443/login?url=https://search.proquest.com/docview/1901899019?accountid=10771

Hosp, J. L., Hosp, M. A., & Dole, J. K. (2011). Potential bias in predictive validity of universal screening measures across disaggregation subgroups. *School Psychology Review*, *40(1)*, 108–131.

Hosp, M. K., Hosp, J. L., & Howell, K. W. (2016). *The ABCs of CBM: A practical guide to curriculum-based measurement (2nd ed.).* Guilford Press.

Karoly, L., Greenwood, P., Everingham, S., Houbé, J., Kilburn, M., Rydell, C., Chiesa, J. (1998). Targeted Early Intervention Programs and Their Benefits. In *Investing in Our Children: What We Know and Don't Know About the Costs and Benefits of Early Childhood*

Interventions (pp. 11-72). Santa Monica, CA; Washington, DC: RAND Corporation. Retrieved March 1, 2018 from http://www.jstor.org.iris.etsu.edu:2048/stable/10.7249/mr898tcwf.9

Kena, G., Aud, S., Johnson, F., Wang, X., Zhang, J., Rathbun, A., Wilkinson-Flicker, S., & Kristapovich, P. (2014). The Condition of Education 2014 (NCES 2014-083). U.S. Department of Education, National Center for Education Statistics. Washington, DC. Retrieved November 24, 2019 from http://nces.ed.gov/pubsearch

King, S. A., Lemmons, C. J., & Hill, D. R. (2012). Response to Intervention in Secondary Schools: Considerations for Administrators. *NASSP Bulletin*, 96(1), 5-22.

King-Thorius, K. A., Maxcy, B. D., Macey, E., & Cox, A. (2014). A critical practice analysis of response to intervention appropriation in an urban school. *Remedial & Special Education*, *35*, 287-299. doi:10.1177/0741932514522100

Koellner,K., Colsman, M., & Risley,R. (2011) Multidimensional Assessment: Guiding Response with Intervention in Mathematics. *Teaching Exceptional Children,* 48-46.

Kressler, B., & Cavendish, W. (2019). High school teachers' sense-making of Response to Intervention: A critical practice analysis. *Education and Urban Society*, 52(3), 1-26.

Kurz, A., Elliott, S. N., Kettler, R. J., & Yel, N. (2014). Assessing students' opportunity to learn the intended curriculum using an online teacher log: Initial validity evidence. *Educational Assessment*, *19(3)*, 159–184.

LeRoux, M., Zvoch, K., & Biancarosa, G. (2018). Using Curriculum-Based Measurement to Predict Student Performance on an Eighth-Grade State Reading Assessment. *Assessment for Effective Intervention*. 45(4), 277-287. https://doi.org/10.1177/1534508418815749

Lewis, K., McColskey, W., Anderson, K., Bowling, T., Dufford-Melendez, K., & Wynn, L. (2007). Evidence-based decision- making assessing reading across the curriculum interventions (Issues & Answers Report, REL 2007–No. 003). U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory Southeast. Retrieved from http://ies.ed.gov/ncee/edlabs.

Marsh, J. A., & Farrell, C. C. (2015). How leaders can support teachers with data-driven decision making: A framework for understanding capacity building. *Educational Management Administration & Leadership*, 43(2), 269. doi:10.1177/1741143214537229

Maskill, M. (2012). "Study of the effectiveness of response to intervention used in elementary school", Eastern Michigan University, Digital Commons@EMU https://commons.emich.edu/cgi/viewcontent.cgi?article=1818&context=theses

Merrill, T. (2018). A Comparison of Curriculum Based Measures of Oral Reading Fluency, University of Southern Maine, ProQuest Dissertations Publishing, 2018. 10838430.

Mitchell, M. A. (2016). *Investigating the use of MAZE-CBM for high school students*, University of Maryland, Digital Repository at the University of Maryland, 2016. https://doi.org/10.13016/M2XJ6T

Murphy, M. R. (2016). Classroom teachers' formative data use for instructional decision-making within tiered academic interventions. (Doctoral dissertation). Retrieved January 24, 2020 from https://scholarcommons.sc.edu/etd/3395

Norman, E.R.V., & Parker, D.C. (2018). A comparison of common and novel curriculum-based measurement of reading decision rules to predict spring performance for students

receiving supplemental interventions. *Assessment for Effective Intervention,* 43(2), 110-120.

Otaiba, S. A., Wanzek, J., & Yovanoff, P. (2015). Response to Intervention. *European Scientific Journal*, *11(10),* 260–264.

Piasta, S. B., & Wagner, R. K. (2010b). Learning letter names and sounds: Effects of instruction, letter type, and phonological processing skill. *Journal of Experimental Child Psychology*, *105*, 324–344. Retrieved from http://dx.doi.org/10.1016/j. jecp.2009.12.008

Podhajski, B., Mather, N., Nathan, J., & Sammons, J. (2009). Professional development in scientifically based reading instruction, teacher knowledge, and reading outcomes. *Journal of Learning Disabilities,* 42(5), 403-417.

Pullen, P. C. & Kennedy, M. J. (2019). *Handbook of Response to Intervention and Multi Tiered Systems of Support.* Routledge, https://doi.org/10.4324/9780203102954

Ridgeway, T. R., Price, D. P., Simpson, C. G., & Rose, C. A. (2012). Reviewing the roots of Response to Interventions: Is there enough research to support the promise? *Administrative Issues Journal*, 2(1), 83-95.

ReadNaturally. (2021). *Response to Intervention.* Retrieved from Read Naturally: www.readnaturally.com

RTI Action Network. (2020) *RTI Action Network.* Retrieved February 18, 2020 from www.rtinetwork.org/learn/what/whatisrti

Shinn, M. R., & Shinn, M. M. (2002). *Administration and scoring of curriculum-based measurement maze for use in general outcome measurement*. Edformation.

Shinn, M. R. (2012, May 9). The Relation of AIMSweb®, Curriculum-Based Measurement, and the Common Core Standards: All Parts of Meaningful School Improvement. Pearson Education. Inc., pp. 1-14. Retrieved June 6, 2019 from https://www.scribd.com/

Smith, J. (2015). *Slideplayer.* Retrieved February 18, 2020 from www.slideplayer.com; https: www.slideplayer.com/slide/9236475/

Snow, C. (2002). Reading for Understanding: Toward an R&D Program in Reading Comprehension. Santa Monica, CA: RAND Corporation. https://www.rand.org/pubs/monograph_reports/MR1465.html

Sparks, S. D. (2015). Study: RTI practice falls short of promise. *Education Week*, 35(12), 1-12.

Stark, P., Noel, A., & McFarland, J. (2015). *Trends in high school dropout and completion rates in the United States*: 1972-2012 (National Center for Education Statistics No. NCES 2015-015). U.S. Department of Education.

Stevenson, N. A. (2017). Comparing curriculum-based measures and extant datasets for Universal Screening in middle school reading. *Assessment for Effective Intervention*, 42(4), 195-208.

Swartz, S., Geraghty, C., & Franklin-Guy, S. (2011). Response to Intervention (RtI): Implementation and Legal Issues. Education Law http://educationallaw.org

Tindel, G., Nese, J. F. T., Stevens, J. J., & Alonzo, J. (2013). Growth on oral reading fluency measures as a function of special education and measurement sufficiency. *Remedial and Special Education*, 37(1), 28-40.

Tindal, G. (2013). Curriculum-based measurement: A brief history of nearly everything from the 1970s to the present. *ISRN Education, need volume(issue)*, 1–29. doi:10.1155/2013/958530 Order this entry before previous one.

U.S. Department of Education, National Center for Education Statistics. (2015). Retrieved December 21, 2020 from http://nces.ed.gov/pubsearch

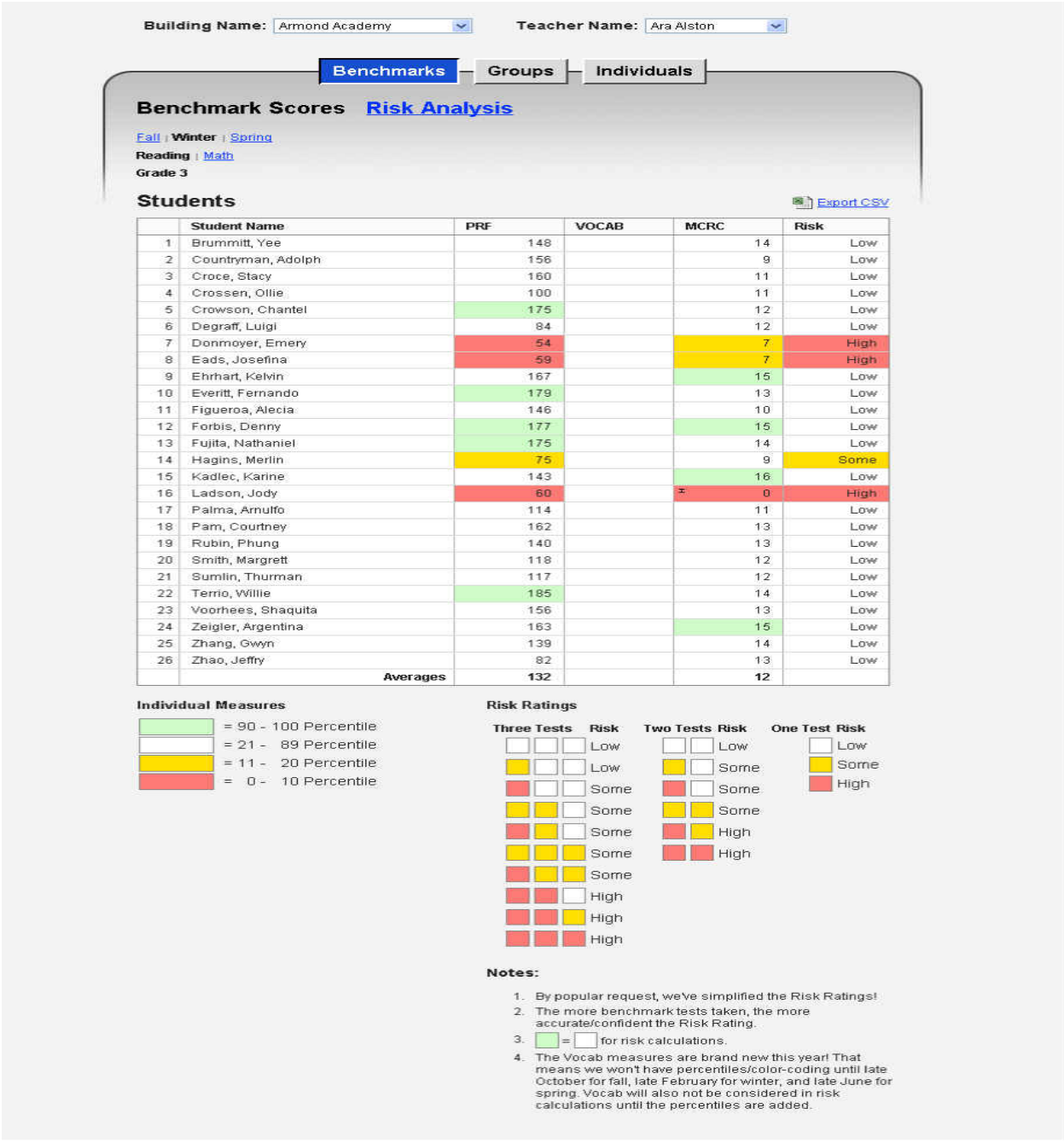
Vaughn, S., & Fuchs, L. S. (2003). Redefining learning disabilities as inadequate response to instruction: The promise and potential problems. *Learning Disabilities Research and Practice*, 18, 137–146.

Vukovic, R. K., & Siegel, L. S. (2010). Academic and cognitive characteristics of persistent mathematics difficulty from first to fourth grade. *Learning Disabilities Research & Practice*, 25(1), 25-38.

Zirkel, P. A., & Thomas, L. B. (2010). State laws and guidelines for implementing RTI. *Teaching Exceptional Children*, 43(1), 60-73.

APPENDICES

Appendix A: EasyCBM Sample Score Report



Building Name: Armond Academy Teacher Name: Ara Alston

Benchmarks | Groups | Individuals

Benchmark Scores Risk Analysis

Fall | **Winter** | Spring

Reading | Math

Grade 3

Students

Export CSV

	Student Name	PRF	VOCAB	MCRC	Risk
1	Brummitt, Yee	148		14	Low
2	Countryman, Adolph	156		9	Low
3	Croce, Stacy	160		11	Low
4	Crossen, Ollie	100		11	Low
5	Crowson, Chantel	175		12	Low
6	Degraff, Luigi	84		12	Low
7	Donmoyer, Emery	54		7	High
8	Eads, Josefina	59		7	High
9	Ehrhart, Kelvin	167		15	Low
10	Everitt, Fernando	179		13	Low
11	Figueroa, Alecia	146		10	Low
12	Forbis, Denny	177		15	Low
13	Fujita, Nathaniel	175		14	Low
14	Hagins, Merlin	75		9	Some
15	Kadlec, Karine	143		16	Low
16	Ladson, Jody	60		* 0	High
17	Palma, Arnulfo	114		11	Low
18	Pam, Courtney	162		13	Low
19	Rubin, Phung	140		13	Low
20	Smith, Margrett	118		12	Low
21	Sumlin, Thurman	117		12	Low
22	Terrio, Willie	185		14	Low
23	Voorhees, Shaquita	156		13	Low
24	Zeigler, Argentina	163		15	Low
25	Zhang, Gwyn	139		14	Low
26	Zhao, Jeffry	82		13	Low
	Averages	**132**		**12**	

Individual Measures

= 90 - 100 Percentile
= 21 - 89 Percentile
= 11 - 20 Percentile
= 0 - 10 Percentile

Risk Ratings

Three Tests Risk	Two Tests Risk	One Test Risk
Low	Low	Low
Low	Some	Some
Some	Some	High
Some	Some	
Some	High	
Some	High	
Some		
High		
High		
High		

Notes:

1. By popular request, we've simplified the Risk Ratings!
2. The more benchmark tests taken, the more accurate/confident the Risk Rating.
3. = for risk calculations.
4. The Vocab measures are brand new this year! That means we won't have percentiles/color-coding until late October for fall, late February for winter, and late June for spring. Vocab will also not be considered in risk calculations until the percentiles are added.

Appendix B: AIMSweb Sample Score Report

Intervention Assignment

Start Date	End Date	Frequency	Length (mins)
2/8/2018	6/4/2018	Daily	45
Intervention			
Sample385 will receive an Early Literacy intervention named Deb's Reading2. This will occur daily for 45 mins.			
Intervention Description			
description			

Goal Statement

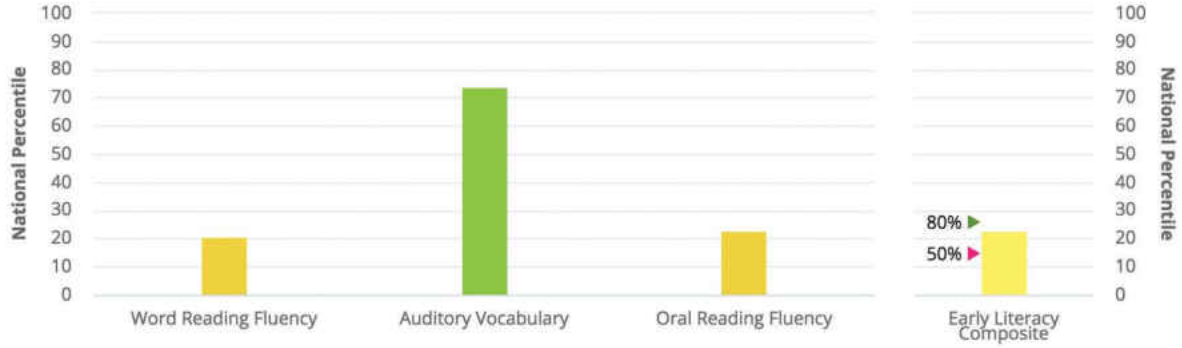
Sample385's current rate of improvement (Trend ROI) is 2.14 points per week on Oral Reading Fluency. To reach the goal score of 68 by 6/4/2018, Sample385 will need to improve at an average rate of 1.52 points per week.

	Baseline 12/11	12/18	12/25	1/1	1/8	1/15	1/22	1/29	2/5	2/12	2/19	2/26	3/5	3/12
Score	30	30			28	26		25	25	26	25	27	30	34	37
Errors	0	0			5	0		0	0	0	0	0	0	0	0
Goal ROI	1.52	1.52			1.52	1.52		1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52
Trend ROI					-0.61	-0.84		-0.87	-0.78	-0.62	-0.56	-0.39	-0.14	0.17	0.46
Intervention Trend ROI					-0.61	-0.84		-0.87	-0.78	-0.62		2.00	2.67	3.18	3.24

	3/19	3/26	4/2	4/9	4/16	4/23	4/30	5/7	5/14	5/21	5/28
Score	39	44	41	44	49	52	54	53	72	73	76
Errors	0	0	0	0	0	0	3	0	0	0	0
Goal ROI	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52
Trend ROI	0.69	0.96	1.04	1.14	1.28	1.41	1.51	1.55	1.81	1.99	2.14
Intervention Trend ROI	3.00	3.09	2.63	2.44	2.52	2.57	2.56	2.45	2.85	3.06	3.20

Early Literacy Summary

Spring Performance Goal: 30th national percentile



What do these early literacy scores mean?

This graph shows Sample7's Winter benchmark test results compared to a national sample of Grade 1 students.

At the skill level, Sample7's score on...

- **Word Reading Fluency** shows a below average ability to read high-frequency words aloud.
  This score should be interpreted with caution because the test session was either interrupted or repeated.
- **Auditory Vocabulary** shows an average ability to identify familiar objects and actions.
- **Oral Reading Fluency** shows a below average ability to read stories aloud.
  This score should be interpreted with caution because the test session was either interrupted or repeated.

What does this Early Literacy Composite Score mean?

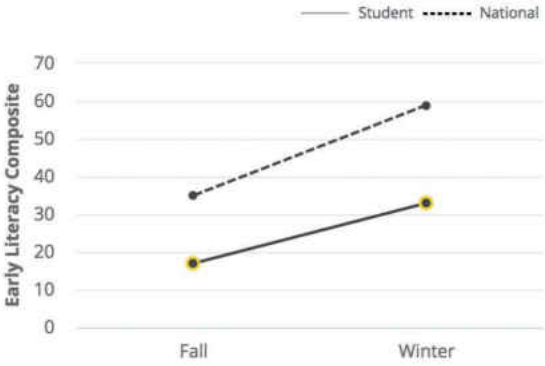
Sample7's Early Literacy Composite national percentile score is 23, which is below average. This score is above the 50% line. Students with scores in this range have a greater than 50% chance of achieving spring performance goals. Sample7's risk level is moderate.

- **At the composite level, Sample7's score is below average.**

Recommendation

Based on Sample7's below average performance on the Early Literacy Composite, this student would benefit from interventions targeting below average skill areas.

Student Growth



Are Sample7's early literacy skills improving?

This graph shows Sample7's Early Literacy Composite benchmark performance compared to a national sample of Grade 1 students. The solid line represents Sample7's scores, and the dashed line represents the average literacy-skill growth of the national norms group.

Sample7's literacy-skill growth is greater than 45% of students in the national sample who have Early Literacy Composite scores in the below average range.

Appendix C: Data Request Letter

Dear Participant:

My name is George Thomas Hopson II, and I am a Doctoral Candidate at East Tennessee State University. I am working on my dissertation in Educational Leadership and Policy Analysis. To finish my studies, I need to complete a research project. My research study's name is Response to Intervention2 easyCBM and AIMSweb intervention programs: How they impact student growth.

The purpose of this study is to examine the levels of efficacy of each program on student growth scores by examining existing data. I would like to request a brief online report to your lead interventionists or administrators using easyCBM or AIMSweb. It should only take about 10 to 30 minutes to finish. You will be asked to present data about tier 2 and tier 3 students' scores in easyCBM and AIMSweb. The information sheets should include universal screener scores and rate of improvement scores. You will also be asked to report any students' movement from tier to tier. Since this study deals with existing student data, the risks are none. However, you may also feel better after you have had the chance to express yourself about any concerns you may have. This study may benefit you or others by allowing further insight into intervention application.

Your confidentiality will be protected as best we can. Since we are using technology, no guarantees can be made about the interception of data sent over the Internet by any third parties, just like with emails. We will make every effort to make sure that your name is not linked with your answers. Outlook has security features that will be used: IP addresses will not be collected, and SSL encryption software will be used. Although your rights and privacy will be protected, the East Tennessee State University (ETSU) Institutional Review Board (IRB) (for non-medical research) and people working on this research in the ELPA Department can view the study records.

All information that can identify you will be removed from the data. This data will then be stored for possible use in future research studies. We will not ask for additional consent for those studies. Your information will not be used for any future studies.

Taking part in this study is voluntary. You may decide not to take part in this study. You can quit at any time. If you quit or decide not to take part, the benefits or treatment that you would otherwise get will not be changed.

If you have any research-related questions or problems, you may contact me, George Hopson, @ 423-741-8400 or by email at zgth12@etsu.edu. I am working on this project together with my professor, Dr. William Flora. You may reach him at 540-230-5548. Or by email @ floraw@etsu.edu. Also, you may call the chairperson of the IRB at ETSU at (423) 439-6054 if you have questions about your rights as a research subject. If you have any questions or concerns about the research and want to talk to someone who is not with the research team or if you cannot reach the research team, you may call an IRB Coordinator at 423/439-6055 or 423/439-6002.

Sincerely,
George Thomas Hopson II
Doctoral Candidate

East Tennessee State University

Clicking the AGREE button below indicates

- I have read the above information
- I agree to volunteer
- I am at least 18 years

☐ I AGREE

☐ I DO NOT AGREE

VITA

GEORGE THOMAS HOPSON II

Education:	Ed.D. Educational Leadership, East Tennessee State University, Johnson City, Tennessee, 2021
	M.A. Supervision and Leadership, Lincoln Memorial University, Harrogate, Tennessee, 2012
	B.A. Music Education Instrumental, East Tennessee State University, Johnson City, Tennessee, 1999
Professional Experience:	Transportation Supervisor, Elizabethton City Schools 2020 to Present
	Assistant Principal, Elizabethton High School, Elizabethton, Tennessee. 2013-2020
	Principal, Harold McCormick Elementary, Elizabethton, Tennessee, 2018-2019
	Teacher, Virginia High School, Bristol, Virginia, 2000-2013
	Board of Directors, Executive Member Carolina Indoor Performance Association 2005- 2010
	Teacher, Linkhorne Middle School; Lynchburg, Virginia, 1999-2000
Honors and Awards:	One of the "Top 50" Band Directors that Make a Difference 2009 School Band and Orchestra Magazine
	The "Semper Fidelis" Award for Musical Excellence
	Most Outstanding Musician Award East Tennessee State University Department of Music 1997, 1998