BARRIERS TO THE IMPLEMENTATION OF DIGITAL INSTRUCTIONAL RESOURCES:

A Mixed-Methods Implementation Evaluation of Lexia Core5 Reading and Dreambox Math in Stafford County Public Schools

ELEVATE STAFFORD

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EXECTUIVE SUMMARY

During the COVID-19 pandemic, Stafford County Schools (SCPS) recognized a need to address learning loss. With the 2021-22 school year being the first full year of in-person learning for all students since the start of the COVID-19 pandemic, SCPS invested in division-wide contracts for two evidence-based digital instructional resources, that could be used in school and at home, to address learning loss. SCPS chose *Lexia Core5 Reading* to support students with foundational reading skills and comprehension and *Dreambox Math* to support math instruction. All elementary schools in SCPS had licenses for each student for both *Lexia Core5 Reading* and *Dreambox Math*. Given that both *Lexia Core5 Reading* and *Dreambox Math* rely on a heavy investment of time and resources, SCPS requested an implementation evaluation to understand the extent to which *Dreambox Math* and *Lexia Core5 Reading* supported instruction for students during the 2021-22 school year. The evaluation focused on the following questions:

1. *To what extent are K-5 teachers implementing Lexia Core5 Reading and/or Dreambox Math?*
2. *To what extent is there a relationship between training on how to use Lexia Core5 Reading or Dreambox Math and how a teacher implements the program?*
3. *To what extent did Lexia Core5 Reading and Dreambox Math professional development impact K-5 teachers' implementation?*
4. *What is the relationship between school supports and teachers' implementation of Lexia Core5 Reading or Dreambox Math?*

The researchers chose a mixed-methods approach to obtain and understand information from various qualitative sources, including teachers, school leaders, district leaders, and specialist interviews. Then they triangulated this data with quantitative sources, surveys, and reports.

KEY FINDINGS

Lexia Core5 Reading

- **Most K-5 teachers in SCPS reported they implemented *Lexia Core5 Reading* with their students in the 2021-22 school year.**

The implementation of *Lexia Core5 Reading* was high among K-5 teachers, regardless of grade level, based on survey results and *Lexia Core 5 Reading* usage reports.

- **Different training experiences resulted in teachers implementing *Lexia Core5 Reading* in different ways.**

While most teachers received *Lexia Core5 Reading* training, that training was variable across K-5 sites which translated to a high degree of variability in how *Lexia Core5 Reading* was implemented across K-5 classrooms.

- **Principals determined professional development needs at the individual school level, creating inconsistencies across the division and variance in how teachers used *Lexia Core5 Reading* in their classrooms.**

SCPS follows a site-based management approach, so school principals plan and provide professional development at their individual schools. Because of variance in principal knowledge of *Lexia Core5 Reading*, inconsistency in professional development was high, impacting how *Lexia Core5 Reading* was implemented across K-5 classrooms.

- **While school supports assisted individual teachers and even some school sites; overall, there is no relationship between school supports in SCPS and teachers' implementation of *Lexia Core5 Reading*.**

Based on qualitative and quantitative data, it was noted that school supports provided to teachers in the form of clear expectations, professional learning communities, support by an instructional coach, and time allocated in the master schedule had no bearing on how *Lexia Core5 Reading* was implemented in K-5 classrooms.

Dreambox

- **Regardless of grade level, the implementation of *Dreambox Math* was sporadic and inconsistent across SCPS elementary schools.**

Survey results and *Dreambox Math* usage reports indicated that, regardless of grade level, *Dreambox Math* was implemented by K-5 teachers sporadically.

- **There was no relationship between *Dreambox Math* training and how teachers implemented *Dreambox Math* during the 2021-22 school year.**

While training occurred for some teachers, survey results indicated that it had no relationship on how *Dreambox Math* was implemented across K-5 classrooms by teachers.

- **Lack of professional development at the school and classroom level prevented school staff from implementing *Dreambox Math*.**

Based on quantitative and qualitative data, there was no clear professional development plan for implementing *Dreambox Math* at any elementary school, leading to low implementation levels.

- **Principals matter. *Dreambox Math* was not supported at the school level because principals lacked knowledge and understanding of the program.**

Teacher responses in both the survey and interviews indicated that they were not provided as much support for *Dreambox Math* as they were provided with Lexia Core5 Reading. This was no surprise, as most principals interviewed had limited knowledge and limited experience with *Dreambox Math*.

RECOMMENDATIONS

Implementation: Use Provided Guidance

To implement any instructional tool with fidelity, guidance from the vendor should be followed for the first year to promote consistency and coherence. After the first year, adaptations with guidance from instructional specialists can be made to fit the context of the school or division.

Professional Development and Training: Build Capacity of Teachers

A well-structured training and professional development plan reflecting adult learning principles should be implemented to maximize teacher capacity. Having this in place, along with a train-the-trainer model, would assist with instructional coherence across the division.

RECOMMENDATIONS

School Supports: Create Structures Designed for Support and Accountability

When implementing new programs, principals should create structures to support monitoring and accountability of instructional practices including clear expectations aligned with school goals, time allocated in the master schedule, professional learning community processes, and coaching and feedback on the new program(s).

Continuous Improvement: Conduct Program Evaluations

While this research was focused on an implementation evaluation, conducting a program evaluation the following year coupled with a return-on-investment evaluation the subsequent school year would ensure the division is focused on aligning instructional programming to student outcomes.

INTRODUCTION

Partner Organization

Stafford County Public Schools (SCPS) currently serves approximately 30,000 students in grades Pre-K through 12 in 33 schools. The division has two early childhood centers, 17 elementary schools, eight middle schools, five high schools, and one school for alternative education. Approximately 54% of financial support comes from the state, 41% local, and 5% federal. For 2020-21 the student population identified as 44% White, 22.1% Hispanic, 20.9% Black, 8.3% Multiple Races, 3.8% Asian, and 0.3% as American Indian (Stafford County Public Schools, 2022). SCPS requested our assistance with an implementation study to understand the utilization of digital instructional resources – Lexia Core5 Reading (for literacy development) and Dreambox Math (for math development). While the division has a research and evaluation arm, the team is small and welcomed support from Vanderbilt University Ed.D. students. SCPS seeks to understand the extent to which *Lexia Core5 Reading* and *Dreambox Math* have supported students' instruction during a turbulent era of public education.

Stafford County Public Schools
Inspire | Empower | Excel

Area of Inquiry

SCPS prides itself on being a close-knit division that believes all children can succeed, regardless of their background. Its vision is to be a "dynamic, goal-oriented learning community committed to preparing our students for success in further education, work, and citizenship" (Stafford County Public Schools, 2019). Therefore, the division must identify programs with effective instructional approaches, including systematic, sequential, adaptive, and multimodal features.

Finding an instructional program that meets all students' needs, including those not reading on grade level, addresses a significant need in the elementary curriculum and instructional spaces. There is significant debate about how to deliver reading instruction that addresses gaps in skills; therefore, assessing the implementation of *Lexia Core5 Reading* will be valuable to many school districts and schools.

Based on pre-pandemic data, all schools in the division have maintained accreditation despite countless school closures across Virginia during 2020-21. In addition, many student and teacher absences in the 2021-22 school year impacted student outcomes. Hence, SCPS has actively worked to engage in intervention and emphasized robust learning experiences, including using digital instructional resources. Digital instructional resources, such as *Lexia Core5 Reading* and *Dreambox Math*, have published research on their effectiveness regarding systematic and sequential instruction. Providing effective intervention for elementary school students that can close skill gaps is crucial to long-term academic success and continues to be a priority, especially for districts dissatisfied with their current student achievement results.

BACKGROUND AND CONTEXT

Academics

Given its diverse population, SCPS takes great pride in being one of the largest Virginia school divisions. According to the Virginia Department of Education School Quality Profile (2022), in the 2018-2019 school year, 79% of all students in Stafford County achieved proficient or advanced scores in their English reading performance. In 2020-21, post-pandemic, only 68% of all students in Stafford County scored as proficient or advanced. In math, during the 2018-19 school year, 84% of all students in Stafford County achieved proficient or advanced scores, while in 2021-22, post-pandemic, only 50% of students in Stafford County scored as proficient or advanced. See Figure 1 below.

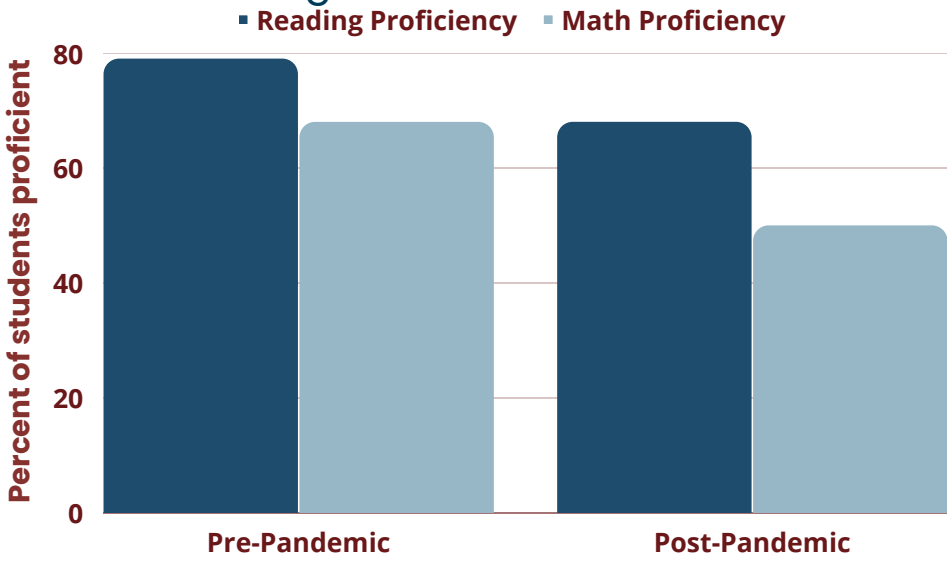


Figure 1
Comparison of Math and Reading achievement pre and post the pandemic.

COVID-19 Pandemic and Digital Instructional Resources

It is blatantly evident that the COVID-19 pandemic took a major toll on student performance nationally. Drops in student achievement are especially obvious in schools with high numbers of students identified as economically disadvantaged. The SCPS division worked actively on intervention, while recognizing the need for robust learning experiences for their student population. Before the COVID-19 pandemic, SCPS was not a 1:1 division, meaning they did not provide each student and teacher with an individually assigned laptop computer or tablet. During the COVID-19 pandemic, the division quickly adopted a 1:1 laptop model and expanded its use of digital instructional resources to combat learning loss. *Lexia Core5 Reading* and *Dreambox Math* are two of the most widely used digital instructional resources in elementary schools nationwide and were selected for implementation in SCPS. SCPS knew there would be disruptions in instruction and student experience due to COVID-19 absences. The division subsequently made plans for the start of the 2020-21 school year to include onboarding for teachers focused on utilizing new technology resources.

Toward this end, SCPS postponed the beginning of the 2020-21 school year by three weeks to prepare appropriately for face-to-face and virtual instruction. According to leadership in the division office, SCPS provided professional development to teachers on how to use *Canvas*, *Google Suite*, *Lexia Core5 Reading*, and *Dreambox Math*, as well as how to engage students effectively using these resources. In addition, SPCS provided every student with a laptop and wireless access to families who required it. With Virginia schools staying virtual for most of the school year and the enormous stress of the COVID-19 pandemic, SCPS did not evaluate the usage or the impact of Lexia Core5 Reading and Dreambox Math in real time. While the 2020-21 school year was a transition year for SCPS teachers and students, the expectation was that when the school year started in 2021, teachers would implement *Lexia Core5 Reading* and *Dreambox Math* to address learning loss.

The COVID-19 pandemic caused intermittent schooling from March 2020 to June 2021, leading to learning loss, evident by the 2021 end-of-grade exam scores. For the 2021-22 school year, instruction was fully face-to-face; however, there were still quarantine guidelines set forth by the Centers for Disease Control and Prevention (CDC) that interrupted schooling for some students and teachers; thus, virtual instruction still occurred. While some schools in SCPS utilized *Lexia Core5 Reading* and *Dreambox Math* before COVID-19 as an intervention, division-wide access for all students to both of these resources began in the fall of 2020. Before the 2020-21 school year, the division purchased only a select number of licenses.

Lexia Core5 Reading

Lexia Core5 Reading is "an adaptive blended learning program that accelerates the development of literacy skills for students of all abilities, helping them make that critical shift from learning to read to reading to learn" (Lexia Core5 Reading | Lexia Learning, n.d.). The program, by design, allows for differentiation as students work at their own pace on skills based on continuous assessment. *Lexia Core5 Reading* has a strong rating from ESSA, making it an evidenced-based digital instructional resource promoted to accelerate the development of literacy skills. *Lexia Core5 Reading* provides the features of reading programs aligned to the science of reading: explicit and systematic targeting all six areas of reading. The program is considered a blended instructional resource because students can work through the app, and teachers can provide instruction using printable lessons and skill building. The program adapts to students' current performance and allows for personalized instruction.

Lexia Core5 Reading has recommendations for use based on the student risk category and grade. Students' risk category is assigned based on the calculated percentage probability that a student will meet their grade level end-of-year benchmark. As of September 2022, the lowest recommended minutes per week are 15 for students on target, and the highest recommendation is 80 minutes per week for students identified as high-risk. Recommendations include the number of minutes and unit targets.

> "Lexia Core5 Reading Once Again Helps K–5 Students Across the Country Close Reading Gaps and Even Exceed Grade-Level Benchmarks."
>
> - Lexia Learning, 2019

Table 1

Recommended Minutes per Week by Risk Category for Lexia Core5 Reading

Grades	Recommended Minutes per Week by Risk Category				
	High Risk (1-30%)	Some Risk (31-50%)	Some Risk (51-79%)	On Target (80-99%)	Not Yet Assigned Risk
PreK	20 mins/wk	20 mins/wk	15 mins/wk	15 mins/wk	15 mins/wk
K - 3	60 mins/wk	50 mins/wk	30 mins/wk	20 mins/wk	40 mins/wk
4 - 5	80 mins/wk	70 mins/wk	40 mins/wk	20 mins/wk	40 mins/wk

- Students in grades **6 through 12** who are enrolled in Core5 have a target of **100 mins/wk.**

The unit target is a research-based measure that considers the average amount of time it takes to complete units, how many units are in each grade level of material, and the student's Performance Predictor range. The unit target corresponds to the student's usage target and is a rate of two units for every ten minutes of usage. For example, a student with a weekly usage goal of 40 minutes would have a weekly target of 8 units (Lexia Core5 Reading | Lexia Learning, n.d.).

Dreambox

Dreambox Math is an online adaptive mathematics platform for grades K-8. *Dreambox Math* has a game-like interface to engage students in mathematical learning that aligns with individual state standards and Common Core State Standards (Curriculum and Alignment - Dreambox Math, n.d.). The curriculum is conceptually based and focuses on utilizing virtual manipulatives as a method for students to increase their mathematical knowledge. The platform focuses on “Intelligent Adaptive Learning,” which allows the program to track each student's interaction with the program both within and outside the lesson format. The program establishes an individualized learning path for each student by tracking interactions (Dreambox Learning - Online Math & Reading Solutions for Students K-12, n.d.). The program has received a strong rating from ESSA (Lexia Core5 Reading Once Again Helps K–5 Students Across the Country Close Reading Gaps and Even Exceed Grade-Level Benchmarks | Lexia Learning, 2019). The tracking component includes reports allowing teachers and parents to monitor a student's progress on mathematical concepts (Dreambox Learning, Inc., 2021).

"The program establishes an individualized learning path for each student by tracking interactions.

-Dreambox Learning, 2021

CONCEPTUAL FRAMEWORK

No one theory exists regarding the conceptual foundation of adult learning education, though the techniques of andragogy approach learning as problem-based (Merriam et al., 2012).

Hence, the grounding theory of this research project study is Knowles' Adult Learning Theory, which focuses on the self-directed process of adult learning (Knowles et al., 2011). It was vital to connect learning theory to adult education to assess the implementation of Lexia Core5 Reading and Dreambox Math, along with educator practice on student outcomes. Specifically, considering the literature regarding student achievement and teacher quality, we must acknowledge that the quality of a teacher can lead to higher student achievement (Darling-Hammond et al., 2005; Stronge, 2018). Assessing how adults learn, along with learning theory and the implementation of curriculum using digital instructional resources, such as Lexia Core5 Reading and Dreambox Math, was key to understanding the role of professional development, training practice, and school structures on student achievement.

Much research surrounds student outcomes and teacher education (Goe, 2007), as well as the impact of professional development and improving student achievement (Yoon et al., 2007; Colbert et al., 2008). Additionally, there is research surrounding school structures, such as coaching and professional learning communities, and the link between coaching and adult learning theory is also confirmed by the theory of andragogy (Cox, 2006; Kelly, 2017; Lubin, 2013). However, there needs to be more research surrounding teacher training and the awareness of adult learning theory in implementing digital instructional resources to improve student outcomes. Acknowledging this, educational entities, such as school districts focusing on supporting teacher quality and training to improve student outcomes, may not know the best approach to supporting adult learners by implementing instructional resources, particularly in SCPS's case, Lexia Core5 Reading and Dreambox Math. Therefore, this research was shaped by adult learning theory as the foundational theory that impacts all variables in this study. The conceptual framework highlights the connection between adult learning theory, training, professional development, and school structures in implementing instructional resources. See Figure 2.

Figure 2

Conceptual Framework. Demonstrating Adult Learning Theory Themes Work in Concert with Training, Professional Development, and School Supports to Facilitate Implementation

Adult Learning Theory

The research within adult education highlights a clear difference between how educators teach children and adults due to the difference in the learning process (Knowles et al., 2015). Malcolm Knowles pioneered the theory of andragogy, defined as "the art and science of helping adult learning" (Knowles, 1970, p. 4). Knowles shared that there are five assumptions of andragogy 1): adults bring a wealth of experience to the educational setting, 2) they are self-directed learners, 3) they are problem-centered in their learning, 4) they enter the educational settings ready to learn, and 5) they are best motivated by internal factors (Knowles, 1980). Finally, in 1984, he provided four principles that are applied to adult learning: 1) adults need to be a part of the planning and evaluation of their learning, 2) their life experiences (and mistakes) are essential to their learning process, 3) subjects need to have immediate relevance and application to their job or personal life, and 4) learning increases when it is central to performance or problem center, rather than context centered (Knowles, 1984). This model serves as the foundation for adult learning theory.

Adults need to know why they must learn a particular concept or skill (Shi, 2017). It needs to be meaningful and have a purpose for them to experience learning, and it must focus on the immediacy of application. Hence, adult learning theorists focus on the learner (Minter, 2011). Minter (2011) highlighted that having an understanding of adult learning theory and collaboration with other educators are concepts that are important for adult educators. Adult educators include those who educate teachers, such as content specialists, principals, trainers, and coaches. Ross-Gordon (2011) and Lambert et al. (2014) suggested that organizational entities should have context and understanding of the multiple roles and tasks adults balance and consider that context as they plan structures surrounding their progress. Understanding the nature of adult learners should shape educational practices surrounding knowledge building for teachers and should be internalized within learner structures such as training and professional development.

Training

According to Allen et al. (2022), “training refers to the goal of modifying the capacities of those who receive it; simply put, those who have been “trained” are (hopefully) able to do things they could not before.” There is a need to provide teachers with training; training is one of the most predominant ways to improve skills and support improved performance (Tamsah et al., 2023). Training, however, is different from professional development. The goal of training is to provide knowledge or skills that are needed for success within a role (Gill, 2016). Understanding the basics of what to do is the key tenet of training. Given the context provided by SCPS’s Request for Assistance to Vanderbilt’s Ed.D. program, this study focused on the training and the implementation of two digital instruction resources. To implement a resource, teachers need to have basic knowledge and skill regarding the resources. Training that lacks connection to classroom practice can hinder technology implementation (Wells, 2007). Though training is necessary, there has been a major push to shift from having a culture of training that is a one-time occurrence to a method that embodies tenants more closely related to professional development, creating long-lasting effects regarding knowledge and practice.

Professional Development

According to Darling-Hammond et al. (2017), professional learning is:

> Structured professional learning that results in changes to teacher knowledge and practices, and improvements in student learning outcomes. Seven features usually comprise effective professional development: content-focused, incorporates active learning, supports collaboration, uses models of effective practice, provides coaching and expert support, offers feedback and reflection, and sustained duration (Darling-Hammond et al., 2017).

The researchers utilized this definition for the purposes of this study, given Darling-Hammond's credibility as one of the world's foremost authorities on professional development ("Professor Linda Darling-Hammond," 2003). Darling-Hammond and colleagues thoroughly analyzed effective teacher professional development features in the 2017 Learning Policy Institute report. The features of effective teacher professional development address the audience of adult learners, as well as the aspects of professional development that facilitate transfer to practice. The seven features include: content-focused, incorporates active learning, supports collaboration, uses models of effective practice, provides coaching and expert support, offers feedback and reflection, and sustained duration. These features apply to professional development at the school, district, and broader sector levels. Effective professional development aims to change teacher knowledge and practice and improve student learning outcomes.

Professional Development

At the school level, the effectiveness of professional development is tied to the design of professional development. Ensuring effective professional development has the power to provide teachers with the knowledge that can boost their self-confidence and make them feel empowered (Bendtsen et al., 2022). At the district or system level, four areas can be addressed to provide effective professional development: identifying professional development needs, choosing approaches most likely to be effective, implementing approaches with quality and fidelity, and assessing professional development outcomes.

School Supports

School supports, for the context of this research, are defined as clear expectations, professional learning communities, administrator or coach walk-through feedback, and time. Each listed school support provides teachers with an avenue to increase student learning (Malone & Tietjens, 2000).

Clear Expectations

In schools rated as ‘recognized’ or ‘exemplary,’ principals exhibit instructional leadership actions such as setting clear expectations and monitoring instruction by engaging in walk-through observations (Hauth, 2016). Clarity is a core foundational learning and behavior management strategy. Principals must communicate expectations to staff as instructional leaders to enhance students’ academic success (Ovando & Ramirez, 2007). For this study, the researchers define clear expectations using Hattie's (2009) definition of teacher clarity. To teach and implement instruction, teachers must deeply understand what, why, and how to instruct and know what is characterized as an exemplar in their practice. Hattie and Zierer (2018) provide a strong definition surrounding clear expectations, specifically around clarity in shaping teachers' behaviors to improve student learning.

> Clarity describes a set of teacher behaviors that are vital to engaging and empowering all students in their learning process by helping them clearly understand what they are learning, why they are learning it, and what they are expected to know or be able to do to demonstrate what they have learned
>
> (Hattie, 2009, pp. 125-126)

Professional Learning Communities (PLCs)

A professional learning community (PLC) is an ongoing process in which educators work collaboratively in recurring cycles of collective inquiry and action research to achieve better results for the students they serve. Professional learning communities operate under the assumption that the key to improved learning for students is continuous job-embedded learning for educators (DuFour et al., 2006, pp.2-4).

The ongoing, reflective, collaborative, and inclusive questioning focused on professional growth and learning. Many schools have adopted or been encouraged to adopt PLCs because of the opportunities they create for stimulating professionalization (De Neve et al., 2015). De Neve cites the work of Wahlstrom and Lewis, who identify four PLC characteristics that describe why this type of professional development is considered such a favorable context. These four characteristics are deprivatization practice, reflective dialogue, collective responsibility, and shared values and vision. In particular, reflective dialogue is most strongly related to student achievement. These characteristics align with the work of Bryk, Camburn, and Louis and their characterization of PLCs through behavioral and mental dimensions. The behavioral dimension is structured by collaborative activities that occur between teachers. Strong PLCs build on teachers' discussions with colleagues centered on teaching, learning, and instructional practice.

PLCs are most effective when a school is grounded in beliefs of collective responsibility and shared norms for student learning. Research on PLCs centers on five main tenets: collective creativity, shared values and vision, supportive and shared leadership, supportive conditions, and shared personal practice (see Newmann, 1996; Murphy, 2004). These beliefs facilitate change in practice to occur more frequently. Allowing teachers to discuss classroom practices with colleagues and reflect on those discussions drives changes in teacher behavior. PLCs create a learning structure and establish professional capacity for increasing student achievement (Louis & Marks, 1998).

Coaching and Feedback

Coaching provides a unique opportunity for teachers to work with experts or peers. Instructional coaches are in high demand and are often seen as the lynchpin in the success of initiatives such as response to intervention. Coaching can draw across the features of professional development and provide all of these as part of the same experience for a teacher. This individualized approach to professional development is particularly effective. A coach may provide connections and facilitate coherence for a teacher. This experience facilitates the success of the coaching as well as the other efforts to increase teacher effectiveness or change teacher practice to improve student outcomes.

The role of coaches influences instructional planning. According to Desimone and Pak, "coaches help teachers navigate the tricky world of aligning the design of their lessons and performance tasks with academic standards while also helping them base their instructional decisions on student diagnostic information" (Desimone & Pak, 2017, p. 5). This process inherently incorporates the features of active learning. Teachers can engage directly with a coach in a variety of ways:

> Active learning through instructional coaching occurs when teachers collectively participate in learning teams with peers in the same subject area or grade level. Coaches can facilitate social learning processes by working with teachers in groups, commonly through grade-level meetings, in which they jointly discuss progress monitoring strategies, instructional improvement strategies, student data, and curricular modifications (Desimone & Pak, 2017, p. 7).

Instructional improvement strategies and curricular modifications are typically conveyed as feedback. According to Elford et al. (2021), feedback is "any information the recipient receives that informs their understanding or restructures their thinking or beliefs related to their performance, knowledge or skills" (Elford et al., 2021, p. 4). According to Brookhart (2017), the six essential elements that characterize feedback that support student achievement are 1) timeliness, 2) focus on one or more strengths and one area of improvement or next steps, 3) focus on the learning process and student's work, 4) focused on the process, 5) shared in steps or pointers with little steps, and 6) positive, specific and clear. Even if implemented well, feedback may not have immediately obvious features in its coherence.

Another method of gathering feedback is through instructional walkthroughs, which allow the observer to gather information surrounding the quality of instruction – including strengths and weaknesses. According to Grissom et al. (2013), principals spend an average of 12.7% of their time on instruction-related activities. Brief classroom walkthroughs are the most common activity, accounting for 5.4% of principals' time use (Grissom et al., 2013). To complement content-focused professional development, "curricular and instructional models and modeling help teachers to have a vision of practice on which to anchor their learning and growth" (Darling-Hammond et al., 2017, p. 11). Examples of models and modeling include analyzing student work, analyzing student-teacher dialogue or conferences, and observations. Models and modeling, content-focused professional development, and active learning can transform teacher instructional practices (Barlow et al., 2014).

Coaching and Feedback

Time to learn, especially surrounding the length and scheduling of time, has been an increasing topic of discussion and research in the wake of the COVID-19 pandemic, which exacerbated learning loss (Kraft, 2022). As educational entities begin to work to accelerate student learning, focus on methods that would support student learning has been evaluated. Scholar John Carroll proposed a mathematical formula in his work, “Model of School Learning” (Carroll, 1963):

Degree of learning= Time spent learning/ time needed to learn.

"Countless research studies have affirmed that students who engage in rigorous grade-level content have higher achievement than those who spend less time on rigorous content (Rangel, 2007). Focusing on policies surrounding time, such as maximizing academic learning time rather than simply increasing time, is key when implementing and using instructional resources to support student learning. "

West Ed, a nonpartisan research agency, highlights district and school level recommendations surrounding time and learning in their Time and Learning policy brief. This brief analyzes the implementation of a time inventory in which the focus on “creative scheduling and staff redeployment strategies" allows learning supports such as lower student to teacher ratios that focus on core academic content (WestEd, 2001, p. 2). The American Educational Research Association suggests other strategies of time to consider in the educational context, including extending the school day or calendar year to meet the learning needs of students (Rangel, 2007). Extending the day creates opportunities for intervention time for students who need extra academic support.

Intervention time is one of the more prominent strategies to consider when considering time as a school structure. The reauthorization of the Individual Disabilities Education Act in 2004 allowed schools to embrace learning for all students by establishing the response to intervention (RTI) process (US Department of Education, n.d.). RTI is a "multi-tiered approach to the early identification and support of students with learning and behavior needs" (National Center for Learning Disabilities, n.d.). Interventions are typically designed to be delivered in small groups to at-risk students within the RTI or Multi-Tier Systems of Support (MTSS) framework. First introduced by Dr. Hill Walker's 1996 paper, the multi-tiered approach is a framework involving data-based problem-solving and decision-making to improve a system (Swenson et al., 2017). In education, MTSS is used to support students' intervention in academic instruction, behavior, attendance, and social-emotional support. Tiered supports are typically broken down into three tiers: core instruction, targeted small group instruction, and intensive individual intervention (A Comprehensive Guide to MTSS, n.d.; Gersten et al., 2009).

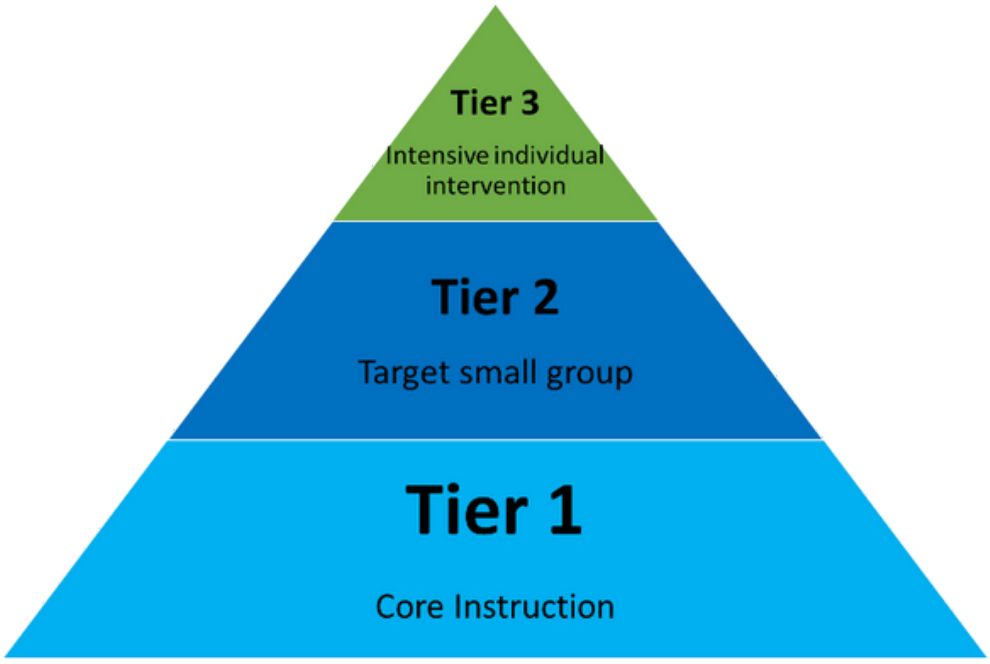


Figure 3
The MTSS Pyramid. Visualization of the MTSS Framework as a Three-Tiered Pyramid

Implementation

Lexia Core5 Reading has tiered recommendations based on the student risk category. Given the program's adaptive features, use recommendations change as students progress toward their grade level end-of-year benchmark. At a minimum, it is recommended that students use Lexia Core5 Reading for 15 minutes per week, while the unit target for completion is aligned with the individual student's performance predictor. Each student receives a weekly usage target based on their current month's predictor. According to the Lexia Learning Help Center:

> This target is the number of minutes the student needs to complete each week, to increase the probability that they will reach the end-of-year benchmark for their grade level. Usage targets range from 15-60 minutes per week for PK students and from 20-80 minutes per week for students in grades K-5 (Lexia Learning Help Center, n.d.).

Dreambox Math provides recommended usage primarily focused on five or more weekly lessons. Although there are also weekly recommendations about minutes, five lessons per week is the most visible and widely referenced recommendation tied to outcomes. The fewest minutes recommended are for grades K-2: 30 to 60 minutes and 5 to 10 lessons per week. Grades 3-8 have the same recommendations of 60-90 minutes per week and 7 to 8 lessons per week (Dreambox Recommended Usage for Students, 2021). Dreambox Math offers much flexibility in terms of its recommendations for implementation. The platform can be used at school, at home, during station rotations, small group instruction, blended learning, or even as an intervention within MTSS (Why Dreambox.Pdf, 2021.).

RESEARCH PURPOSE AND QUESTIONS

This study seeks to understand the implementation of the two digital instructional resources, *Lexia Core5 Reading* and *Dreambox Math*, in elementary schools in SCPS in the 2021-22 school year. To that end, the researchers will explore these research questions in a mixed-methods study:

01

To what extent are K-5 teachers implementing *Lexia Core5 Reading* and/or *Dreambox Math*?

02

To what extent is there a relationship between training on how to use *Lexia Core5 Reading* or *Dreambox Math* and how a teacher implements the program?

03

To what extent did *Lexia Core5 Reading* and *Dreambox Math* professional development impact K-5 teachers' implementation?

04

What is the relationship between school supports and teachers' implementation of *Lexia Core5 Reading* or *Dreambox Math*?

METHODS

To effectively answer the four research questions and further the research around the implementation of *Lexia Core5 Reading* and *Dreambox Math* in elementary schools, the researchers embarked on a mixed methods study. See Figure 4. The researchers utilized a mixed-methodology approach, emphasizing qualitative and quantitative processes throughout the implementation evaluation on *Lexia Core5 Reading* and *Dreambox Math*.

Qualitative data were collected through the following methods:

1	2	3
An initial context-gathering meeting with SCPS central office division literacy and math specialists	Document review and analysis	Interviews with teachers, content specialists, principals, and division leaders

The initial content gathering served as a space for the researchers to ask questions and make notes to define the scope of the evaluation and ensure the key questions would be addressed. Both document analyses and interviews aimed to provide an understanding of stakeholder impact and practice around the implementation of *Dreambox Math* and *Lexia Core5 Reading*. Quantitative data were collected through the following methods:

- Teachers' responses from a survey
- The 2021-2022 usage data from *Lexia Core5 Reading* and *Dreambox Math*.

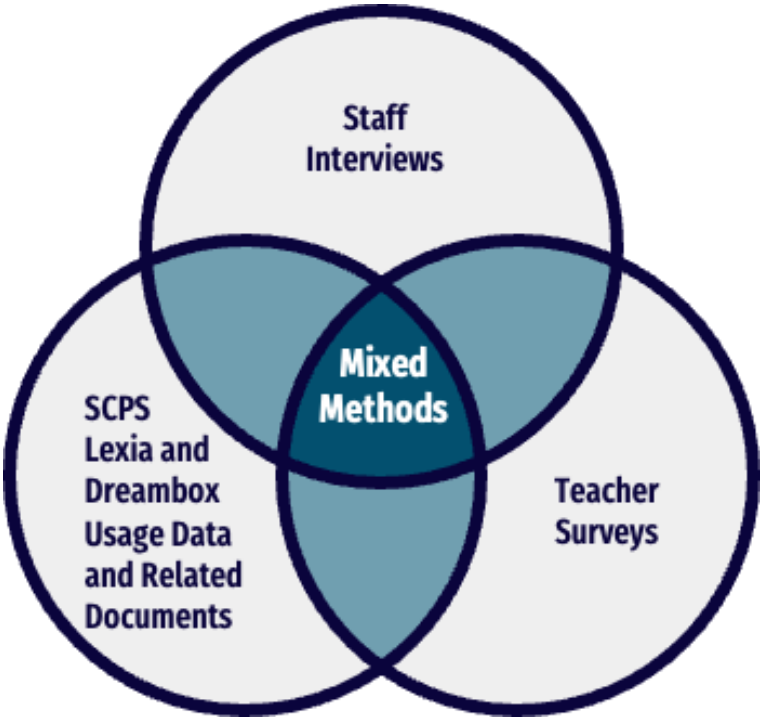


Figure 4
Mixed Methods Approach

The surveys aimed to understand better the relationship between professional development and school supports on the implementation of *Lexia Core5 Reading* and *Dreambox Math*. This approach allowed for systematic inquiry that explored the implementation of *Dreambox Math* and *Lexia Core5 Reading* in SCPS.

Stakeholder Analysis

We used interviews, a survey, usage data from *Dreambox Math* and *Lexia Core5 Reading*, and documents provided by the division to triangulate findings and gain insight into how *Dreambox Math* and *Lexia Core5 Reading* were implemented in SCPS. This triangulation also enabled researchers to explore factors such as professional development and school support that potentially shaped the use and implementation by teachers. To understand the implementation of these programs, we engaged with a wide variety of stakeholders across the division (users, influencers, providers, and leadership), focusing on those who directly impacted the programs' implementation. The stakeholder groups can be divided into four distinct groups: 1) elementary school teachers, 2) elementary school leaders (principals/assistant principals), 3) school-based specialists/interventionists, and 4) central office personnel.

Since SCPS expanded the utilization of *Dreambox Math* and *Lexia Core5 Reading* after the division went to a 1:1 laptop model during the COVID-19 pandemic, it was important to interview both central office division leaders and school-based leaders as they facilitated the decision-making regarding the implementation of the digital instructional resources. Specifically, school leaders were asked to share their expectations around *Dreambox Math* and *Lexia Core5 Reading*, their stance regarding professional development on the digital instructional resources, and school supports that assisted with the integration of *Dreambox Math* and *Lexia Core5 Reading* into instruction.

Qualitative Data Collection & Analysis

We conducted a series of interviews to understand the extent to which *Dreambox Math* and *Lexia Core5 Reading* have been implemented. With input from the SCPS Directors and the survey completion data, five elementary schools were selected: Falmouth ES, Grafton Village ES, Park Ridge ES, Widewater ES, and Anne E. Moncure ES for interviews. By utilizing purposeful sampling (Patton, 1987), most campuses were identified for interviews based on survey responses, specifically, those whose responses indicated a higher utilization of the digital instructional resources during the 2020-21 or 2021-22 school year from the closed-ended teacher survey utilized within this study. Because of the variability among the schools regarding implementation, we identified outliers or deviant campuses (Patton, 1987). We hoped these sites would provide the most content-rich interviews to capture the holistic scope of implementation of *Lexia Core5 Reading* and *Dreambox Math* in SCPS. Further details are provided in the qualitative data collection and analysis sections.

Additionally, responses to open-ended questions, such as: “Based on your experiences with Lexia, how did the program impact student learning?” and “Based on your experiences with Lexia, how did the program impact student learning?” were used to identify grade levels in which teachers were most likely utilizing *Dreambox Math* or *Lexia Core5 Reading* within their classrooms. Hence, the researchers requested the following demographics of interview participants at each campus:

Table 2

Initial Requested Campus Demographics for Interviews

Campus Name	K-2 Grade Teachers	3-5 Grade Teachers	Specialist	Leaders
Anne E. Moncure ES	2 or 3 2nd Grade teachers	2 or 3 3rd grade teachers	ELA Coach Math Coach	Principal Assistant Principal
Falmouth ES	None	2 or 3 4th grade teachers 2 5th grade teachers	ELA Coach Math Coach	Principal Assistant Principal
Grafton Village ES	2 or 3 1st grade teachers 2 or 3 2nd grade teachers	None	ELA Coach Math Coach	Principal Assistant Principal
Park Ridge ES	None	2 or 3 4th grade teachers 2or 3 5th grade teachers	ELA Coach Math Coach	Principal Assistant Principal
Widewater ES	2 or 3 1st grade teachers	2or 3 5th grade teachers	ELA Coach Math Coach	Principal Assistant Principal

Interview requests were sent to teachers and the instructional specialists by the principals of these five campuses. Initial contact with the selected principals was made by the researchers’ SCPS primary division contact. However, there was a change to the schedule at Grafton Village ES based on special education meetings occurring during the week of interviews. The SCPS primary division contact replaced the school with Rockhill ES.

Each school principal created a schedule based on staff availability, knowledge of teaching and learning, particularly around resources such as *Lexia Core5 Reading* and/or *Dreambox Math*, capacity on the interview date, and the researchers' grade requests. Twenty-two interviews with elementary school teachers were conducted, six with school leaders (five principals and one assistant principal), ten with content specialists (ELA and Math), and two additional with instructional resources teachers, given their knowledge of *Lexia Core5 Reading* and *Dreambox Math*. See Table 3.

Table 3

Modified Campus Demographics for Interviews

Campus Name	K-2 Grade Teachers	3-5 Grade Teachers	Specialists	Leaders
Anne E. Moncure ES	1st grade teacher 2nd grade teacher	3rd grade teacher 5th grade teacher 4th grade teacher	ELA Coach Math Coach	Principal
Falmouth ES	1st grade teacher 2nd grade teacher	3rd grade teacher 4th grade teacher	ELA Coach Math Coach	Principal
Rockhill ES	Kindergarten teacher 2nd grade teacher	2 3rd grade teachers 5th Grade teacher	ELA Coach Math Coach	Principal Assistant Principal
Park Ridge ES	1st-grade teacher Kindergarten teacher	3rd grade teacher 5th grade teacher	ELA Coach ITRT	Principal
Widewater ES	Kindergarten teacher 1st grade teacher 2nd-grade teacher	5th grade teacher	Math Coach 2- ELA Coach ITRT	Principal

Additionally, four division level staff were interviewed to capture the perspectives of executive leadership of the division. Though not fully intentional, the schools participating in the qualitative portion of this study represented a range of school sizes, demographics, and locations. See Table 4.

Table 4

Campus Demographics for Interview Sites

School Name	Grade Band	Number of Students	Demographic
Ann E. Moncure ES	Pre-K-5	843	Black-27.8% Hispanic-44.5% White-15.9% Multiple Races-7.7% SWD-9% ED-62.9% EL-30%
Falmouth ES	Pre-K-5	624	Black-26% Hispanic-18.8% White-38.9% Asian-3.4% Multiple Races-12.2% SWD-14.1% ED-53.5% EL-10%
Park Ridge ES	Pre-K-5	825	Black-27.3% Hispanic-20.6% White-36.2% Asian-4.4% Multiple Races-10.7% SWD-9.7% ED-28.5% EL-10.4%
Rockhill ES	Pre-K-5	616	Black-16.1% Hispanic-23.7% White-49.8% Asian-3.2% Multiple Races-7% SWD-14.6% ED-31% EL-9.9%
Widewater ES	Pre-K-5	568	Black-23.6% Hispanic-32.7% White-30.6% Asian-4.6% Multiple Races-7.6% SWD-12% ED-57% EL-22.7%

Interviews

The primary method for obtaining qualitative data was semi-structured interviews. Interview questions were derived from Shafer et al. (1997) working paper and were clustered into categorical bins linked to the researcher's conceptual framework (Appendix A). Initial interview questions were structured, but a semi-structured nature was incorporated to allow the interviewers to probe and explore the bins further based on answers (Patton, 2002). For example, when specialists reported receiving training regarding *Lexia Core5 Reading* or *Dreambox Math*, the interviewers asked follow-up questions based on the timing and context of the training. Additionally, at two schools, the interviews highlighted that instructional resource teachers were integral in the implementation of digital instructional resources.

Interviews lasted 20-45 mins and were primarily conducted in person between October and November 2022. Two interviews were conducted via Zoom because the assigned staff member was off campus on the scheduled interview date. All interviews were recorded and transcribed using closed-captioning or a digital recording device that transcribes automatically (e.g., otter.ai) with participant permission.

Interviews Analysis

The researchers read and listened to the interview transcripts through a listening tour and then engaged in drafting analytical memos (Birks et al., 2008), which allowed the researchers to develop conceptual themes derived from our conceptual framework. Please take a look at Figure 2.

Finally, we organized the interview themes into individual matrices by stakeholders (teachers, principals/assistant principals, content specialists/interventionists, and central office personnel), facilitating the opportunity to identify key themes and connections across the data (Maxwell, 2013). In addition, direct quotes from the interviewers were included in the matrix as descriptive examples of the thematic organization of the bins. All the matrices were then combined to create a master matrix. Conclusions about implementing *Lexia Core5 Reading* and *Dreambox Math* were drawn by engaging in "connecting strategies" (Maxwell, 2013), allowing the researchers to see relationships within the data. A comprehensive implementation matrix can be found in Appendix B.

SCPS Data

The division office, as well as one campus, provided documents for evidence analysis. The division provided usage reports for both *Lexia Core5 Reading* and *Dreambox Math*. Usage reports included redacted student usage for *Lexia Core5 Reading* and *Dreambox Math*. The data on the report for *Dreambox Math* included information regarding school name, grade, teacher name, and redacted student use data, including the number of lessons students completed. The *Lexia Core5 Reading* data report included the school name, grade, and redacted student unit completion data, including the number of units completed. Reports were analyzed to understand average usage across grades and K-5 for *Lexia Core5 Reading* and/or *Dreambox Math*.

The researchers engaged in document analysis to examine the content and structure of documents, focusing on specific elements, words, phrases, relationships, and patterns, to find valuable insights, meaning, and intent (Krippendorff, 2013). The school document provided was the master schedule at Ann M. Moncure elementary school. See Appendix C. This document was utilized as an example of how school structures such as intervention times for Tier II and Tier Reading, Tier II and Tier III Math, WIN (What I Need), and Morning Meeting were scheduled at the elementary school level. Another document provided was the Ann M. Moncure elementary school *Lexia Core5 Reading* and *Dreambox Math* Student Tracker (see Appendix D). This was used to understand how a school-level leader created accountability systems around using *Dreambox Math* and *Lexia Core5 Reading* by week during the 2021-2022 school year. In addition to reviewing the documents provided, the researchers read the open-ended survey responses.

Quantitative Data Collection & Analysis

Data were collected using a survey electronically distributed to SCPS elementary school teachers and usage reports from both L*exia Core5 Reading* and *Dreambox Math*.

Teacher Survey

The researchers created the SCPS Digital Resources Survey (see Appendix E) for teachers, crafting questions given the context of the division, as well as using questions adapted from existing surveys. To ensure our survey's highest degree of reliability, the instrument compiled consisted of previously validated scales and questions that mirror constructs noted in the existing literature related to professional development and school supports. The survey was organized into three sections: background information, *Lexia Core5 Reading*, and *Dreambox Math*. The *Lexia Core5 Reading* and *Dreambox Math* section contained questions that could be categorized into subsections: utilization and implementation, professional development, training, and school supports. We utilized a mix of Likert scale, multiple-choice, and open-ended questions. Questions one through four were background questions. Questions eight and seventeen on professional development were adapted from the 2019 Tennessee Educator Survey Pre-Kindergarten Teacher Branch, which was created through a collaboration with the Tennessee Education Research Alliance, the Department of Tennessee, and Vanderbilt Peabody Education.

The remaining questions, created by the researchers, focused on the training, utilization, and implementation of *Lexia Core5 Reading* or *Dreambox Math*. See Table 5 for the question framework for our digital instructional resources survey.

Table 5

SCPS Digital Instructional Resources Survey Framework fo Teachers

Survey Sections	Question Number			
Background	Questions 1-4			
	Utilization and Implementation	Professional Development	Training	School Supports
Lexia Core5 Reading	Questions 5, 6, 9-13	Questions 8a-e	Question 7	Questions 23a, 23c, 23e, 23g
Dreambox Math	Questions 14, 15, 18-21	Questions 17a-e	Question 16	Questions 23b, 23d, 23f, 23h

To improve question validity, the researchers conducted cognitive interviews with three staff members in a district in North Carolina that implemented *Lexia Core5 Reading* and *Dreambox Math*. The cognitive interview is a method that allows for an in-depth analysis of individual items. "Cognitive interviews test the validity of verbal reports of the respondent's thought process" (Desimone & Le Floch, 2004, p.6). Based on the cognitive interviews, two questions were modified regarding the frequency of occurrence, underutilization and implementation. The teachers responded to the entire survey in under ten minutes.

Given the SCPS's Director of Research, Evaluation, and Strategic Improvement preference, the researchers were led to engage in voluntary response sampling. After receiving IRB approval, the division contact emailed the survey to all SCPS elementary principals to disseminate to their staff, as the researchers did not have access to individual rosters of teacher contact information. To facilitate the distribution, the researchers provided introductory emails containing information about the project, a template email to teachers, and directions to principals to transmit to staff on our behalf (see Appendix F). The 17 elementary school principals sent the survey to all school staff in late September 2022.

After the initial emails, the researchers waited just over two weeks. Then the researchers sent a follow-up email to the division contact to provide a completion rate update and ask for help promoting participation a second time. The researchers made the survey available for five weeks and acquired data from 235 staff members at all 17 elementary schools. All survey respondents were voluntary. Since we did not have the demographics of the individuals who took the survey, it is not possible for us to determine if our sample is representative of the distribution of teachers in Stafford County by age, gender, race, education, or years of experience.

There are a total of 910 elementary teachers in SCPS. 235 staff members took the survey, leading to a response rate of 26%. See Table 6. We did not collect any other comparison demographic information (gender, race, average years of teaching experience, etc.) to determine if the sample was representative of the whole SCPS teacher population.

Table 6

SCPS Digital Instructional Resources Survey Response Rate by School

School Site	Total Teachers in Building	Number of Survey Respondents	Response Rate
Ann E. Moncure ES	65	14	22%
Anthony Burns ES	56	10	18%
Conway ES	60	7	12%
Falmouth ES	50	18	36%
Ferry Farm ES	48	11	23%
Garrisonville ES	48	16	33%
Grafton Village ES	51	6	12%
Hampton Oaks ES	56	10	18%
Hartwood ES	42	9	21%
Kate Waller Barrett ES	61	20	32%
Margaret Brent ES	53	14	26%
Park Ridge ES	53	16	30%
Rockhill ES	49	30	61%
Rocky Run ES	61	12	20%
Stafford ES	52	15	29%
Widewater ES	51	20	39%
Winding Creek ES	53	7	13%
Total	**909**	**235**	**26%**

Teacher Survey Analysis

To conduct our survey research, we utilized Qualtrics and exported our data as an Excel file. However, we encountered some challenges with the data, requiring us to select one response when we had multiple responses for Questions 1 and 2. Additionally, for Question 3, we changed the Likert scale to binary – we changed strongly agree and agree to yes, and we changed strongly disagree and disagree to no. We also combined core instruction and homework; this created three implementation groups that applied to all students. Additionally, we identified incomplete or unanswered questions. We eliminated survey respondents who did not meet the qualifications for the study based on their use of *Dreambox Math* or *Lexia Core5 Reading*. Once the data we re-coded, the data was imported into STATA, and we were able to conduct a variety of quantitative analyses. We started with descriptive statistics such as frequencies and percentages of respondents who received training, sufficient professional development, their confidence level, acknowledgment of school supports, and their implementation approach of *Lexia Core5 Reading* and/or *Dreambox Math*.

Then we conducted chi-squared tests to support research Questions 1-3, which allowed us to assess the relationships between categorical variables such as grade taught, teacher role, and binary responses such as professional development or training received, as well as the use of *Lexia Core5 Reading* or *Dreambox Math*. We aimed to establish meaningful relationships between these variables supporting our research objectives.

Table 7

SCPS Digital Instructional Resources Survey Variables for Chi-squared Test

Research Question	Variable 1	Variable 2
Q1a	*Grade taught (2020-21 & 2021-22 school years)* • K • 1st • 2nd • 3rd • 4th • 5th	*Implementation of Lexia Core5 Reading* • Yes • No
	Teacher Role (2020-21 & 2021-22 school years) • Classroom Teacher • Special Education	
Q1b	*Grade taught* • K • 1st • 2nd • 3rd • 4th • 5th	*Implementation of DreamBox Math* • Yes • No
Q2a	*Lexia Core Reading Classroom Implementation* • As an intervention with all students • As an intervention with a limited number of students • As part of core instruction with all students • As a part of homework	*Prior Training Received* • Yes • No
Q2b	*DreamBox Math Classroom Implementation* As an intervention with all students • As part of core instruction with all students • As a part of homework • As an intervention with a limited number of students • As an intervention with all students • Others	*Prior Training Received* • Yes • No
Q3a	*Lexia Core Reading Classroom Implementation* • As an intervention with all students • As an intervention with a limited number of students • As part of core instruction with all students • As a part of homework	*Received Sufficient Professional Development* • Yes • No
Q3b	*DreamBox Math Classroom Implementation* • As an intervention with all students • As an intervention with a limited number of students • As part of core instruction with all students • As a part of homework	*Received Sufficient Professional Development* • Yes • No

For research question 4, using the SCPS Digital Instructional Resources Survey responses specifically surrounding school supports and implementation, we employed one-way analysis of variance (ANOVA) tests to determine if there was variance in the implementation based on school supports (PLCs, instructional specialists and time). All data coded for the dependent variable for *Lexia Core5 Reading* or *Dreambox Math* implementation matched one of three groups: intervention with all students, core instruction, or intervention with some students.

Usage Reports Analysis

In addition, we analyzed usage reports for both *Lexia Core5 Reading* and *Dreambox Math*. For research question 1, we calculated descriptive statistics to find the average units completed in *Lexia Core5 Reading* across all SCPS elementary schools for the 2021-22 school and the average *Dreambox Math* lessons completed by grade level for the 2021-22 school year.

FINDINGS

The researchers organized the findings by the digital instructional resources: *Lexia Core5 Reading* and *Dreambox Math*. The qualitative and quantitative data analysis for each digital resource is described under the corresponding research question.

Research Question 1a.

Lexia Core5 Reading

The first research question in this study was designed to address the extent to which SCPS teachers, kindergarten through fifth grade (K-5), implemented *Lexia Core5 Reading* in the 2021-22 school year. Using survey results to determine if the grade level assignment for teachers impacted the implementation of *Lexia Core5 Reading*, a crosstabulation between the teachers' grade and *Lexia Core5 Reading* implementation was conducted for the school years 2020-21 and 2021-22. Additionally, we interviewed selected teachers, administrators, and school and district support staff, asked questions about the implementation of *Lexia Core5 Reading*, and analyzed usage reports. A chi-square test for association was performed to determine whether a relationship exists between the grade a teacher taught and *Lexia Core5 Reading*. The 2020-21 school year was used as a comparison for the 2021-22 school year to assess if usage of *Lexia Core5 Reading* increased, decreased, or remained constant from a year of combined virtual and in-person learning to a full year of in-person learning.

TO WHAT EXTENT DID K-5 TEACHERS IMPLEMENT LEXIA CORE5 READING IN THE 2021-22 SCHOOL YEAR?

Most K-5 teachers in SCPS reported they implemented *Lexia Core5 Reading* with their students in the 2021-22 school year.

While no observable difference among grade levels existed in the 2020-21 school year, $X2(5) = 6.92$, $p = .227$, there were observable differences in 1st grade for the 2021-22 school year, $X2(5, N = 124) = 81.48$, $p < 0.001$. Thus, there is an association between the grade taught and the implementation of *Lexia Core5 Reading* in the 2021-22 school year. Specifically, 31.3% of 1st grade teachers reported implementing *Lexia Core5 Reading* in 2021-22, while 100% of all other grade levels reported implementing it. Table 8 provides additional information about implementation by grade level that suggests that 1st grade was an anomaly since teachers in every other grade level reported implementing *Lexia Core5 Reading* in the 2021-22 school year.

Table 8

K-5 Teacher's Grade-level and Lexia Core5 Reading Implementation

Year	K-5 Teacher's Grade	Implementation of *Lexia Core5 Reading*		p-value
		Yes	No	0.227
2020-21	K	23 (95.8%)	1 (4.2%)	
	1st	14 (87.5%)	2 (12.5%)	
	2nd	22 (95.7%)	1 (4.3%)	
	3rd	17 (100%)	0 (0.0%)	
	4th	18 (85.7%)	3 (14.3%)	
	5th	23 (100%)	0 (0.0%)	
2021-22	K	24 (100%)	0 (0.0%)	<0.001
	1st	5 (31.3%)	11 (68.8%)	
	2nd	23 (100%)	0 (0.0%)	
	3rd	17 (100%)	0 (0.0%)	
	4th	21 (100%)	0(0.0%)	
	5th	23 (100%)	0 (0.0%)	

N=124

The interviews with teachers also support the finding that most teachers implemented *Lexia Core5 Reading* with their students in the 2021-22 school year. During interviews, every teacher indicated that they used *Lexia Core5 Reading* with their students. A few comments are highlighted below:

"I have a small group that meets each day Monday through Friday in reading, and I take lessons from Lexia that I can see multiple kids would benefit from and I implement those into my small group."

·"I use both programs daily in my classroom, and I follow up with students on their goals."

"I really like it [Lexia] and then I like to be able to go in and see where they have a need and then pull the resources. For instance, if they don't know letter sounds, I need to pull up the letter sounds that Lexia offers or any of my own letter sound things and do that in a small group."

These examples highlight that most teachers implemented *Lexia Core5 Reading* in their classrooms, but in different ways, from core instruction to intervention to morning work.

Because the survey was administered to all school staff, it was important to determine whether or not there was a relationship between the teacher's role (classroom teacher, special education teacher, other-interventionist, English as a Second Language, AIG specialist, etc.) and *Lexia Core5 Reading* implementation. A chi-square test for association was performed for both the 2020-21 and 2021-22 school years to determine whether there was a relationship between the teacher's role and Lexia Core5 Reading implementation. Since *Lexia Core5 Reading* allows for personalization based on individual student levels, we would expect the usage by classroom teachers and special education teachers to be about the same. As shown in Table 9, the majority of K-5 classroom teachers utilized *Lexia Core5 Reading* with students in the 2020-21 school year, $X2(2) = 0.722$, $p = .697$, and this trend did not change for the 2021-22 school year, $X2(2) = 1.175$, $p = 0.556$. This indicates no relationship between a teacher's role and the implementation of *Lexia Core5 Reading* since the majority of K-5 teachers implemented *Lexia Core5 Reading*. Statistically, there is no relationship between the teacher's role and implementation.100% of the special education teachers surveyed used *Lexia Core5 Reading* with their students as an intervention.

Table 9

K-5 Teacher's Roles and Lexia Core5 Reading Implementation

Year	K-5 Teacher's Role	Implementation of Lexia Core5 Reading		p-value
		Yes	No	0.697
2020-21	Classroom Teacher	106 (93.8%)	7 (6.2%)	
	Other	6 (100%)	0 (0.0%)	
	Special Education	5 (100%)	0 (0.0%)	
2021-22	Classroom Teacher	102 (90.3%)	11 (9.7%)	0.556
	Other	6 (100%)	0 (0.0%)	
	Special Education	5 (100%)	0 (0.0%)	

N=124

Next, we wanted to determine if the implementation by teachers corresponded with student usage, so we analyzed usage reports for the 2021-22 school year. The reports showed that the average units completed in *Lexia Core5 Reading* were 190 units across all SCPS elementary schools. Table 10 below summarizes the average units completed by grade level. According to *Lexia Core5 Reading*, the unit target corresponds to the student's usage target and is a rate of two units for every ten minutes of usage. For example, a student with a weekly usage goal of 40 minutes would have a weekly target of 8 units (Lexia Core5 Reading | Lexia Learning, n.d.). For example, a student in 4th or 5th grade in the category of "some risk" would have a target of 40 minutes per week, resulting in 324 average units by the end of the school year given 36 weeks of instruction. According to SCPS data, the average 4th grade student would have completed about 60% of the units while the average 5th grade student would have completed 51% of the units. While teachers were implementing L*exia Core5 Reading*, they were not following the guidance set forth by *Lexia Core5 Reading*.

Table 10

Average Units of Lexia Core5 Reading Completed in the 2021-22 School Year by Grade Level

Grade Level	Average Units Completed by Grade	Total Number of Students Enrolled in the Division
Kindergarten	182	2084
1st	198	2038
2nd	207	2039
3rd	194	2088
4th	193	2155
5th	166	2232

The survey findings and usage reports show that most students in grades K-5 used *Lexia Core5 Reading* during the 2021-22 school year. However, schools either did not reference the guidance or were not given access to the guidance from *Lexia Core5 Reading* about the usage-time varying for students based on their identified level of need or risk. It is unclear if there is a relationship between the implementation of *Lexia Core5 Reading* and recommendations from the vendor in SCPS elementary schools.

Research Question 2a.

TO WHAT EXTENT IS THERE A RELATIONSHIP BETWEEN TRAINING ON HOW TO USE LEXIA CORE5 READING AND HOW A TEACHER IMPLEMENTS THE PROGRAM?

Different training experiences resulted in teachers implementing *Lexia Core5 Reading* in different ways.

Lexia Core5 Reading

Based on the results of research question one, it is evident that most K-5 teachers in SCPS implemented *Lexia Core5 Reading*. The second research question aimed to determine whether training influenced the implementation of *Lexia Core5 Reading* in K-5 classrooms in SCPS. In the survey, we asked teachers about initial training and its influence on their implementation of *Lexia Core5 Reading* in their classrooms. This information was compared to the information obtained through interviews with school staff, including teachers, administrators, and school and division-level support staff.

A chi-square test for association was performed to determine the relationship between *Lexia Core5 Reading* implementation and prior training (defined as how to use the program). As shown in the output of the results, there is no relationship between the variables $X2(3) = 3.422$, $p = .331$. As seen in Table 11, most teachers who implemented *Lexia Core5 Reading* had previous training; however, that training did not influence how the teachers implemented it with their students.

While almost 70% of SCPS K-5 teachers who received training implemented *Lexia Core5 Reading* as an intervention, 30% who did not receive training also implemented it as an intervention. Therefore, no relationship exists between how *Lexia Core5 Reading* was implemented and prior training.

Table 11

Lexia Core5 Reading Implementation and Prior Training

***Lexia Core5 Reading* Classroom Implementation**	**Prior Training Received**		**P-value**
	Yes	**No**	0.331
As an intervention with all students	52 (69.3%)	23 (30.7%)	
As an intervention with a limited number of students	19 (67.9%)	9 (32.1%)	
As part of core instruction with all students	11 (64.7%)	6 (35.3%)	
As a part of homework	1 (25.0%)	3 (75.0%)	

N=124

The qualitative research conducted through interviews also showed that the training experiences of teachers were varied and inconsistent. There was also inconsistency on when and how teachers were trained, regardless of status as new or veteran teachers. For example, one new teacher shared, "Now I know that you had asked about the training; I haven't had Dreambox or Lexia training." Another stated, “So my new teacher week was during this time, and that was really good, but I didn't have a specific Lexia or Dreambox training."

A veteran teacher reported, "Actually, it [Lexia] was just part of the literacy of literacy breakout session, so it was very minimal."

According to school-based staff, most *Lexia Core5 Reading* training was conducted asynchronously, and those who facilitated that training were driven by school leadership decision-making. As one principal stated, "Vendor PD was available to all schools, but you have to be willing to be vulnerable to say, we got a lot of kids that don't know how to read in our school...and sign up."

The manner in which teachers implemented *Lexia Core5 Reading* was highly variable across the division, which may have resulted from the highly variable training conditions and expectations. The surveys and interviews reflected that teachers participated in training on *Lexia Core5 Reading* at different times and in different ways. Additionally, the takeaways teachers had from the training were not consistent. The training experiences of teachers were different, and therefore their implementation of *Lexia Core5 Reading* was different.

Research Question 3a.

TO WHAT EXTENT DID LEXIA CORE5 READING PROFESSIONAL DEVELOPMENT IMPACT K-5 TEACHERS' IMPLEMENTATION?

Principals determined professional development needs at the individual school level, creating inconsistencies across the division and variance in how teachers used *Lexia Core5 Reading* in their classrooms.

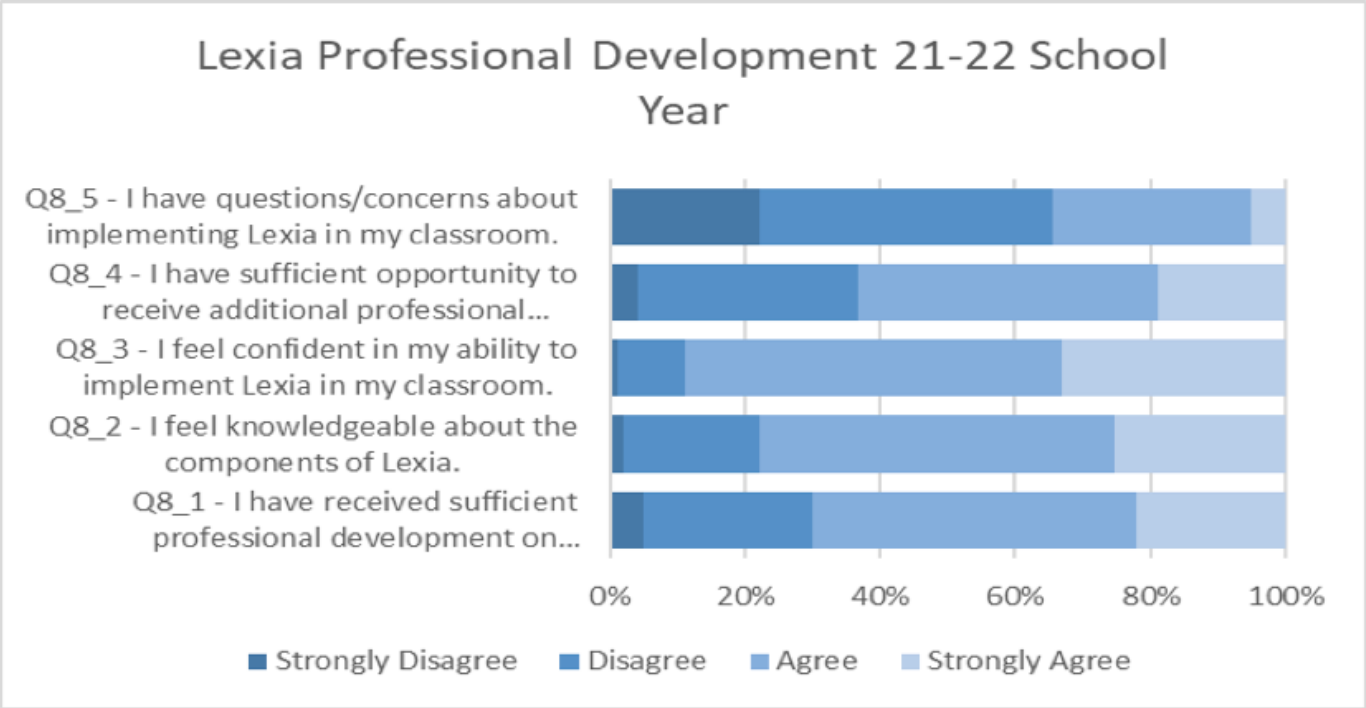
Lexia Core5 Reading

In addition to determining the training and implementation of *Lexia Core5 Reading*, it was important to determine the extent that *Lexia Core5 Reading* professional development impacted K-5 teachers' implementation. In the survey, we used the definition of professional development from Darling-Hammond et al. (2017). We analyzed the survey using descriptive statistics, finding that 70% of teachers indicated they had received sufficient professional development on implementing *Lexia Core5 Reading*. In comparison, 91% of teachers felt confident in their ability to implement *Lexia Core5 Reading* in their classrooms (see Figure 5), which led us to believe that professional development did have a relationship with the implementation of *Lexia Core5 Reading* across K-5 classrooms in SCPS.

A common theme emerged as we interviewed teachers: professional development varied across schools. A central office administrator shared, "Professional Development is a school-based decision, and some principals were figuring it out as they went."

Figure 5

Descriptive Statistics for Lexia Core5 Reading Professional Development Survey Responses (N=164)



We wanted to determine if teacher implementation of *Lexia Core5 Reading* was related to professional development, so a chi-squared test for association was performed. Based on the results of the test, it was noted that there is no significant relationship between the variables, $X^2(3)= 0.809$, $p = .847$. As shown in Table 12 below, the majority of teachers who received sufficient professional development implemented *Lexia Core5 Reading* as an intervention with all students. However, the majority of teachers who indicated that they did not receive sufficient professional development also implemented *Lexia Core5 Reading* as an intervention with all students. In essence, the results indicate that regardless of whether or not the teacher believed they received sufficient professional development,

there was no relationship between the professional development and the way the teacher implemented *Lexia Core5 Reading*. Unquestionably there was much variance in how teachers implemented *Lexia Core5 Reading* in their classrooms.

Table 12

Implementation Based on Lexia Core5 Reading Implementation Manner

***Lexia Core5 Reading* Classroom Implementation**	**Received Sufficient Professional Development**		**p-value**
	Yes	**No**	0.847
As an intervention with all students	71 (32.0%)	27 (30.3%)	
As an intervention with a limited number of students	42(18.9%)	18 (20.2%)	
As part of core instruction with all students	65 (29.3%)	23 (25.8%))	
As a part of homework	44 (19.8%	21 (23.6%)	

N=311

This finding was reiterated in the qualitative interviews. While every staff member interviewed indicated that they received some professional development on how to implement *Lexia Core5 Reading* with students, the professional development varied widely by school. One elementary school principal shared that professional development is based on teacher needs, while another embeds professional development through Professional Learning Communities, which are not differentiated based on teacher needs. Some schools connected with the vendor for professional development, while others had their reading specialists provide the professional development. Across the five school sites where interviews were conducted, teachers indicated varied professional development experiences and varied expectations for use.

Reading specialists are the leaders of the literacy PLCs in most of the schools in SCPS, and the interviews highlighted that the work of PLCs was a promising factor in the implementation of Lexia Core5 Reading. Ideally, *Lexia Core5 Reading* professional development would be integrated into the instructional program for each K-5 school for cohesion purposes. This was the case in two of the five elementary schools where interviews were conducted. Key quotes that exemplify this are outlined below.

1. "Coaches provide wonderful PD weekly." -Teacher

2. ·"I really want teachers to understand the why of what we do. And we're asking teachers to change a lot of the way that they teach and it's hard to change something that you've been doing a long time. So my goal is that a teacher would understand why we are making a shift." -Instructional Coach

3. "In PLC... pull out lessons for tiered intervention groups, one of the paraprofessionals pulls the Lexia report and then highlights who needs what lessons and will pull those students during WIN time." -Teacher

Alternately, PD on *Lexia Core5 Reading* may have only been the focus three or four times per year during “Data Digs” at other schools, making it appear to be an ancillary program rather than a part of the instructional programming at a school. As one teacher stated, "PLC time was not dedicated to Lexia, but quarterly data digs were...we just all knew it was a resource." A teacher at another school reiterated this message, "And then in our PLC, sometimes they'll mention using Lexia, but there's been no real training that anytime they mentioned it, it just kind of reinforces Oh, yeah, we need to stay on top of this.”

It is unknown if the professional development on *Lexia Core5 Reading* provided teachers with the knowledge to boost their self-confidence. The interviews confirmed that some teachers saw a relationship between professional development and their implementation of *Lexia Core5 Reading*. In addition to this, over 90% of teachers surveyed referenced increased confidence in their implementation of *Lexia Core5 Reading* because of professional development.

So, while some promising practices exist in some schools, the interviews substantiated the survey findings on professional development: a lack of consistency and high subjectivity based on school leadership decisions.

Research Question 4a.

WHAT IS THE RELATIONSHIP BETWEEN SCHOOL SUPPORTS AND TEACHERS' IMPLEMENTATION OF LEXIA CORE5 READING?

It was difficult for each principal to determine the school supports needed for *Lexia Core5 Reading* implementation without the support of the division.

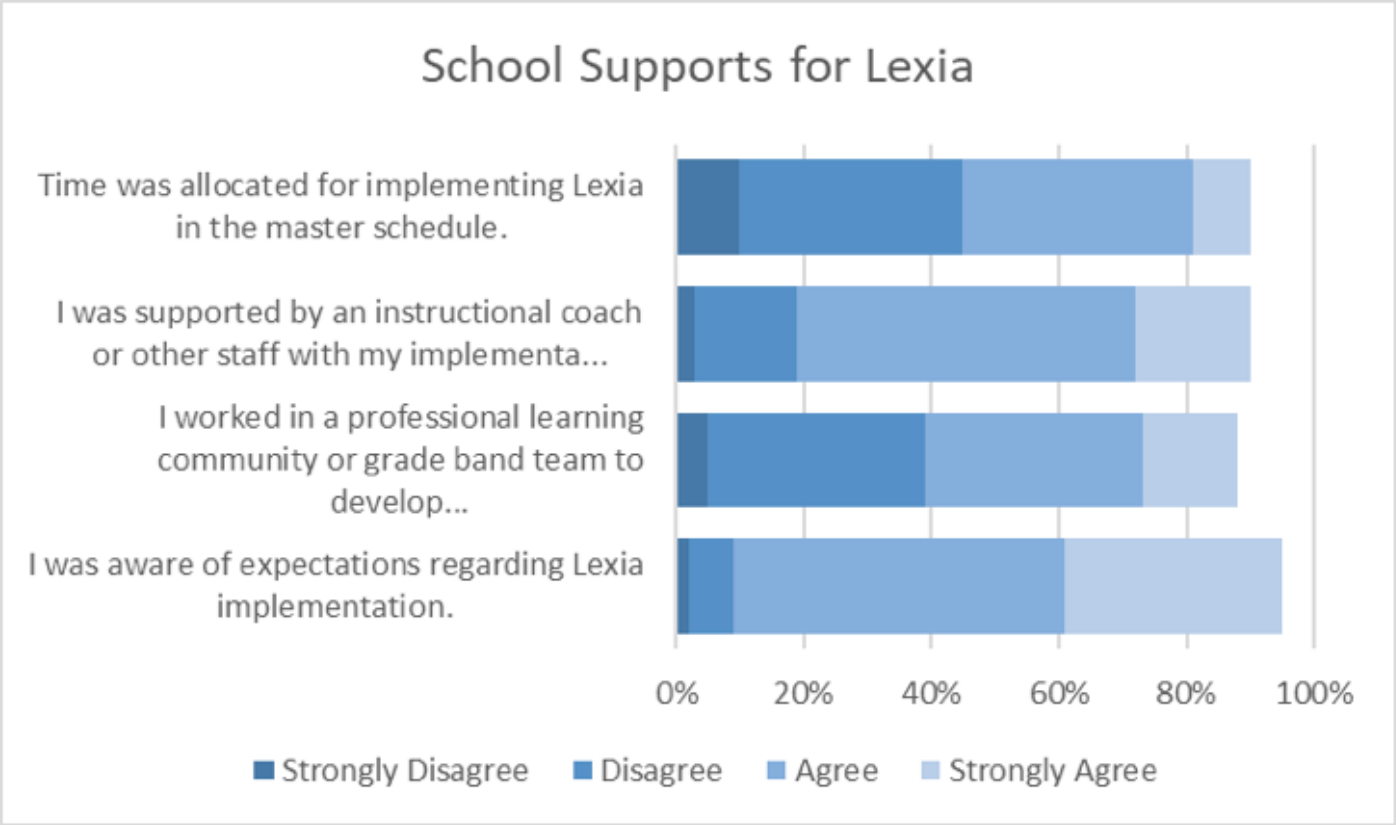
Lexia Core5 Reading

This question is designed to determine the relationship between school supports – defined as clear expectations, professional learning communities, instructional specialist supports, and time allocated in the master schedule –and the implementation of *Lexia Core5 Reading*. According to the survey respondents, 86% were aware of expectations for using Lexia Core5 Reading in their classrooms. However, only 45% indicated that time was allocated in the master schedule for using *Lexia Core5 Reading*.

In addition, 49% of k-5 teachers worked in their Professional Learning Community (PLC) to develop practices and instruction using *Lexia Core5 Reading*. Nearly 70% were supported by the reading specialist, instructional resource teacher, or a school administrator with implementing *Lexia Core5 Reading*. See Figure 6 for more detailed information. It is important to note that some responses were coded as non-applicable, which accounts for the rows not equating to 100.

Figure 6

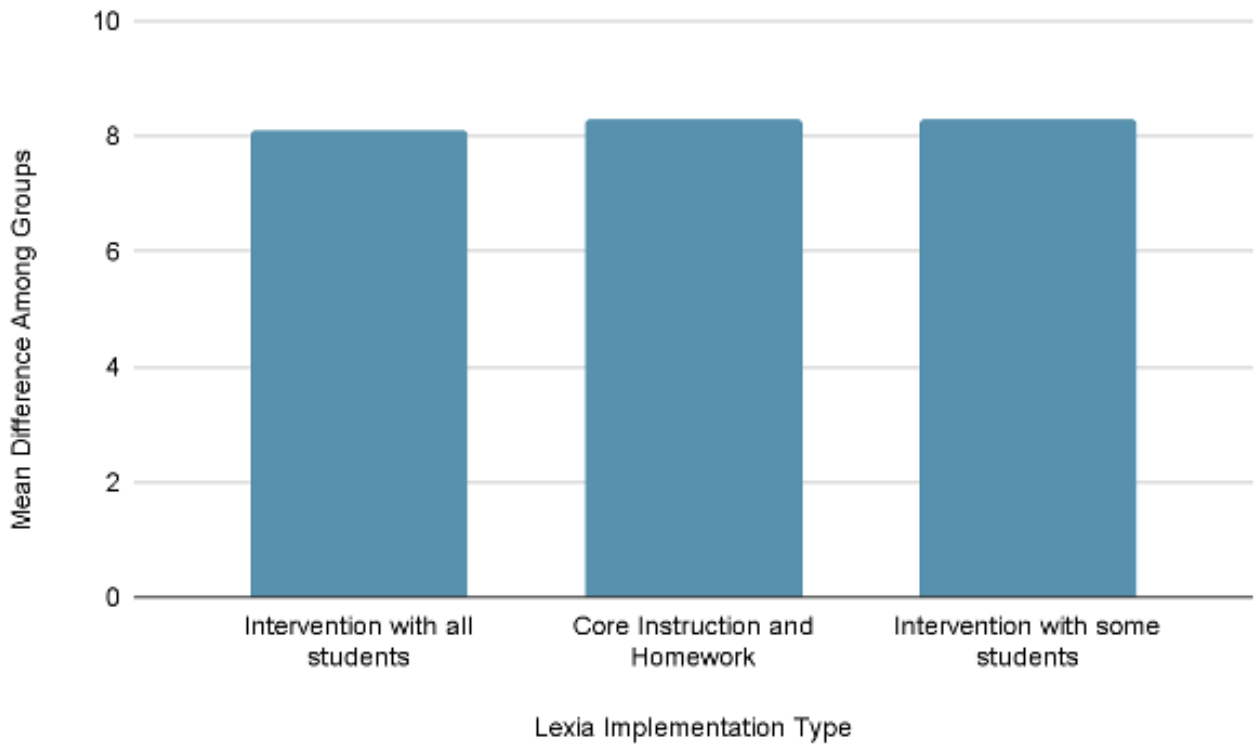
Descriptive Statistics on School Support Survey Responses regarding Lexia Core5 Reading (n=164)



This descriptive data, coupled with the data obtained from conducting a one-way ANOVA to investigate the differences in school support based on *Lexia Core5 Reading* implementation type (see Figure 6 below), highlights that school supports did not have a relationship with how K-5 teachers utilized *Lexia Core5 Reading* within their classrooms. The results of the one-way ANOVA showed that there was no statistically significant difference in how Lexia Core5 Reading was implemented, and the support provided by the school ($F(2,121)=0.213$, $p>.05$). See Appendix G. As shown in Figure 7 below, the mean values are similar for all the categories, and the difference noted is not statistically significant. Once again, this draws attention to the fact that teachers implemented *Lexia Core5 Reading* in various ways because of a lack of school support.

Figure 7

School Support Differences Based on Lexia Core5 Reading Implementation



Expectations were varied across the school sites, with vague expectations provided to school leaders by the division. Regarding division expectations, one principal stated, “Our direction was taken more from the Lexia vendor.” Another principal who provided clear expectations to teachers stated, “The expectation comes from the leadership team, and we follow up on that fidelity during our PLC conversation.” This underscores our earlier finding that PLCs are a promising practice in some schools, but it also indicates how a strong leader can lead implementation efforts without division guidance. As one teacher remarked, " I do not feel like there's a clear expectation from our district or at the school level." " I do obviously have friends around the county, and they also communicate that they do not have expectations at their school, which leads me to believe that our county then isn't giving clear expectations for usage."

With only 45% of teachers responding in the survey that time was built into the master schedule for *Lexia Core5 Reading*, it is not surprising that teachers had variability in how they implemented it in the classroom. Instructional coaches and teachers were aligned in that there was an overall expectation that *Lexia Core5 Reading* should be used with students. Still, time was not allocated for its use, and because it was not a part of the instructional programming, expectations for how to integrate *Lexia Core5 Reading* into core instruction were not provided by the division. As one Reading Specialist noted, "We were kind of recommended, you know, that kiddos get on a certain number of minutes and that teachers watch those." So, while there may have been a time expectation by school leaders, there was no specific time allocated by the school for implementation purposes.

Incentive programs to encourage student use of *Lexia Core5 Reading* were consistent in all schools, with each school customizing its own. While the incentive program was intended for students, it created a process for holding teachers accountable for implementation. One school principal created a spreadsheet that captured data aligned with school expectations and supported teachers who needed assistance with implementation. Teachers recorded data at the classroom level in the spreadsheet for weekly review and analysis by campus leadership. This was a promising practice found in one of the five elementary schools where interviews were conducted.

Quantitative and qualitative results demonstrated there was no relationship between school supports in SCPS and teachers' implementation of *Lexia Core5 Reading*. It was difficult for each principal to determine the school supports needed for Lexia Core5 Reading implementation without the support of the division. In SCPS principals were not provided a framework for implementing *Lexia Core5 Reading*; thus, they lacked the capacity or willingness to offer the support required to implement the program as intended.

Research Question 1b.

TO WHAT EXTENT DID K-5 TEACHERS IMPLEMENT DREAMBOX MATH?

Regardless of grade level, the implementation of *Dreambox Math* was sporadic and inconsistent across SCPS elementary schools.

Dreambox

The first research question this study was designed to address was the extent to which kindergarten through fifth grade (K-5) teachers implemented *Dreambox Math* in the 2021-22 school year. To determine if the grade level of teachers impacted the implementation of *Dreambox Math*, based on survey results, a crosstabulation between the teachers' grade and *Dreambox Math* implementation was conducted for the school years 2020-21 and 2021-22. In addition, usage reports were analyzed, and interviews were conducted with a selection of teachers, administrators, and school and district support staff related to the implementation of *Dreambox Math*.

A chi square test for association was performed to determine whether or not the grade band affected the implementation of *Dreambox Math*. The school year 2020-21 was used as a comparison for the 2021-22 school year to assess if usage increased, decreased, or remained constant from a year of a combination of virtual and in-person learning to a full year of in-person learning. In contrast to *Lexia Core5 Reading* implementation, an observable difference

was noted in the implementation of *Dreambox Math* in the 2020-21 school year, specifically for 1st and 2nd grade teachers, $X2(5) = 21.91$, $p < 0.001$. The observable difference indicates that there was a relationship between the grade taught and *Dreambox Math* implementation in the 2020-21 school year. Conversely, in the 2021-22 school year, there was no relationship between grade level and *Dreambox Math* implementation, as implementation was sporadic across grades, $X2(5) = 3.98$, $p = .552$. The survey showed that implementation rates for 2021-22 ranged from 58.3% in kindergarten to 82.4% in third grade. See Table 13 for detailed information.

Table 13

K-5 teacher's grade and Dreambox Math implementation

Year	K-5 Teacher's Grade	Implementation of *DreamBox Math*		p-value
		Yes	No	<0.001
2020-21	K	24 (100%)	0 (0.0%)	
	1st	13 (81.3%)	3 (18.8%)	
	2nd	17 (73.9%)	6 (26.1%)	
	3rd	17 (100%)	0 (0.0%)	
	4th	21 (100%)	0 (0.0%)	
	5th	23 (100%)	0 (0.0%)	
2021-22	K	14 (58.3%)	10 (41.7%)	0.552
	1st	12 (75.0%)	4 (25.0%)	
	2nd	17 (73.9%)	6 (26.1%)	
	3rd	14 (82.4%)	3 (17.6%)	
	4th	13 (61.9%)	8(38.1%)	
	5th	17 (73.9%)	6 (26.1%)	

The most likely reason that *Dreambox Math* was implemented more in the 2020-21 school year than in the 2021-22 school year is the COVID-19 pandemic and its impact on school schedules. The response to the pandemic necessitated the use of digital resources. In the 2021-22 school year, using digital instructional tools was no longer necessary since students returned for face-to-face instruction. Kindergarten through fifth-grade teachers remarked that *Dreambox Math* was not teacher or student-friendly. Quotes from teachers illustrate this perception below.

"DreamBox is not intuitive, so my kids were frustrated."

"Dreambox is challenging for students. It is not as clear as it needs to be for kids."

"The teacher really has to go in and preview what the lesson looks like. A significant amount of the lessons that are listed as grade level are not in our curriculum and are way too hard."

An instructional coach supported this perception from teachers, "It's an excellent resource. I would like to have teachers use it more deeply. But I understand why they don't have time for that." The implementation of *Dreambox Math* varied greatly – not just across schools but within schools.

Dreambox Math is designed differently than *Lexia Core5 Reading* with a recommendation for use that is more standardized, focusing on the completion of five lessons per week (Dreambox Recommended Usage for Students, 2021). During the interviews, multiple teachers mentioned a target of five lessons per week, but the data in Table 14 highlights that SCPS students completed an average of one lesson per week, which is far below *Dreambox Math* guidance, and the expectations communicated to researchers during interviews. It is worth noting that the math instructional specialist at the central office viewed the five lessons per week as the maximum a student was to use *Dreambox Math*. Considering the implementation of *Dreambox Math*, the survey findings and usage reports show variability in teacher implementation and student use across the division.

Table 14

Average Dreambox Math Lessons Completed by Grade Level in the 2021-22 School Year

Grade	Average Lessons Completed	Total Number of Students Enrolled in the Division
K	115	2084
1	120	2038
2	116	2039
3	120	2088
4	91	2155
5	89	2232

Research Question 2b.

TO WHAT EXTENT IS THERE A RELATIONSHIP BETWEEN TRAINING ON HOW TO USE DREAMBOX MATH AND HOW A TEACHER IMPLEMENTS THE PROGRAM?

There was no relationship between Dreambox Math training and how teachers implemented *Dreambox Math* during the 2021-22 school year.

Dreambox

Based on the *Dreambox Math* results above, it was noted that teachers inconsistently implemented *Dreambox Math* in SCPS in the 2021-22 school year. The second research question was aimed at determining whether or not there was a relationship between training on how to use *Dreambox Math* and the implementation practices of teachers. This research question asked teachers about training – how to use the program – and its influence on how they implemented *Dreambox Math* in their classrooms. Using survey data, a chi-square test for association was performed to determine the relationship between *Dreambox Math* implementation and prior training on how to use the program. While almost 75% of survey respondents indicated that they received prior training on *Dreambox Math*, as shown in the output of the results, there is no relationship between training and how the digital resources were implemented, given that $X2(3) = 3.422$, $p = .331$. See Table 15. This, coupled with the amplification of teachers' voices during the interviews, led the researchers to

believe the training was not comprehensive enough to support implementation in the schools. As indicated by a teacher, "You have all of this information. That's it. You don't get any applications. You don't get any how's it relevant? You don't get any connection to it? How can you use it?" Without proper training on *Dreambox Math* that incorporates tangible applications, teachers will not have the knowledge or skills to implement it with students to improve math outcomes.

Table 15

Dreambox Math implementation and prior training

***DreamBox Math* Classroom Implementation**	**Prior Training Received**		**p-value**
	Yes	**No**	0.331
As part of core instruction with all students	20 (76.9%)	6 (23.1%)	
As a part of homework	2 (50.0%)	2 (50.0%)	
As an intervention with a limited number of students	22 (78.6%)	6 (21.4%)	
As an intervention with all students	42 (66.7%)	21 (33.3%)	
Others	1 (33.3%)	2 (66.7%)	

N=124

The lack of relationship between prior training and implementation was substantiated in teacher and math specialist interviews. Several math coaches discussed using *Dreambox Math* as a Tier 2 intervention with students. One math specialist indicated, "Students who used Dreambox as an intervention made the most growth...there are signs that it is a powerful tool." This aligns with *Dreambox Math* research; however, using *Dreambox Math* as an

as an intervention only was not referenced in the training, which resulted in sporadic implementation across the division as this was a teacher, instructional specialist, or principal decision. While some teachers grasped onto the concept of using *Dreambox Math* as a Tier 2 intervention, “I use it at the end of the day, every day. 5th grade has tiered pullout from 2:30 to 3:00”. Others did not get that memo: "I use both programs every day in my classroom and I follow up with students on their goals.” Based on interview responses, teachers knew they had access to *Dreambox Math* and could or should use the program, but without training or clear expectations communicated by the school or division leaders, it is unknown if implementation could support the academic growth of students.

Research Question 3b.

TO WHAT EXTENT DID DREAMBOX MATH PROFESSIONAL DEVELOPMENT IMPACT K-5 TEACHERS' IMPLEMENTATION OF DREAMBOX MATH?

Lack of professional development at the school and classroom level prevented school staff from implementing *Dreambox Math*.

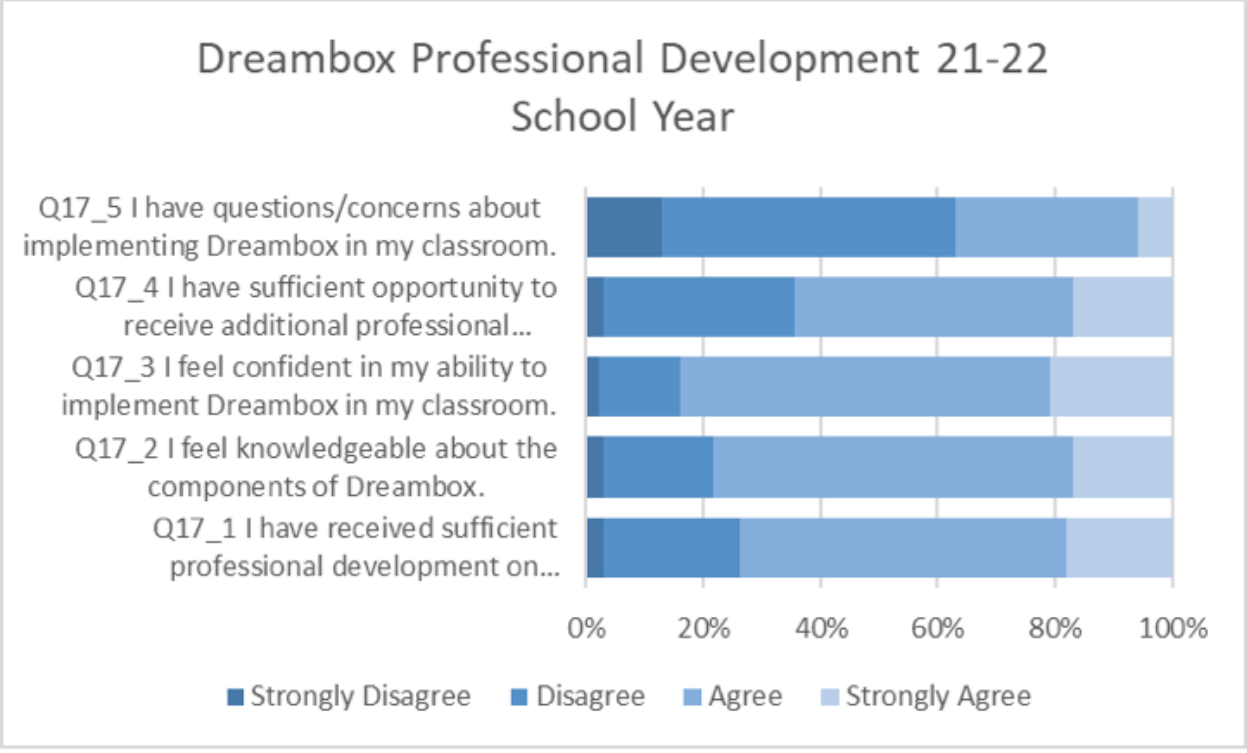
Dreambox

To determine the impact of *Dreambox Math* professional development on K-5 teachers' implementation of Dreambox Math, it was important to determine if there was a relationship between *Dreambox Math* professional development and how teachers implemented Dreambox Math during the 21-22 school year. We used Darling-Hammond et al. (2017) definition of professional development in the survey. When analyzing the descriptive data, it was noted that 73% of teachers indicated that they received sufficient professional development on implementing *Dreambox Math*. In comparison, 84% of teachers felt confident in their ability to implement *Dreambox Math* in their classrooms (see Figure 8). This data was not supported by the qualitative data we collected. Based on interviews conducted with teachers, "Dreambox PD was a check-the-box type of thing." One principal stated, "Teachers were asked to spend a ridiculous amount of time on [asynchronous] Dreambox PD, and I said, "no way."

There are several reasons for this contradictory evidence. Sampling bias is one factor since survey respondents may not be representative of the entire population, resulting in biased responses. In contrast, interviewees were selected by SCPS based on certain criteria unknown to researchers, which likely leads to interviewees providing more nuanced responses. Another reason is social desirability bias, where respondents in surveys may provide answers that they believe are more socially desirable or acceptable, while interviews provided an opportunity for respondents to feel more comfortable sharing their true opinions and experiences. Finally, contextual differences, such as where the survey or interview took place can also influence individual responses.

Figure 8

Descriptive Statistics on Dreambox Math Professional Development Survey Responses (N=145)



Additionally, we wanted to determine if there were significant differences in teacher implementation of *Dreambox Math* based on professional development. To determine if teacher implementation of *Dreambox Math* was related to professional development, a chi-squared test for association was performed. Based on the results of the test, it was noted that there is no significant relationship between both variables, $X^2(3)= 0.996$, $p = .802$. Consequently, it can be said that the implementation of *Dreambox Math* by the teachers is not affected by whether or not the teachers received sufficient professional development. The same pattern that existed with *Lexia Core5 Reading* exists with *Dreambox Math*. As shown in Table 16 below, the majority of teachers who received sufficient professional development implemented it as an intervention with all students, and a close second was implementation as a part of core instruction with all students. Even though that is the case, this suggests that professional development was not the driver for how *Dreambox Math* was implemented in classrooms.

Table 16

Dreambox Math Implementation Based on Perceived Sufficient Professional Development

DreamBox Math Classroom Implementation	Received Sufficient Professional Development		p-value
	Yes	No	0.802
As an intervention with all students	64 (32.2%)	17 (25.8%)	
As an intervention with a limited number of students	35(17.6%)	13 (19.7%)	
As part of core instruction with all students	60 (30.2%)	21 (31.8%)	
As a part of homework	40 (20.1%)	15 (22.7%)	

n=265

Similarly to *Lexia Core5 Reading*, whether or not to use *Dreambox Math* was a school-based decision. Because of this, principals would lead this effort in their schools; however, according to principal interviews, most were not provided *Dreambox Math* professional development. According to one principal, "only training I've gotten on Dreambox comes from my math specialist." This was corroborated by another principal, as well. If principals are expected to monitor instruction and provide feedback and coaching to teachers, then they should have professional development on *Dreambox Math*. This lack of knowledge on the principal's part led to unclear expectations with little to no support.

Although *Dreambox Math* has resources on its website, including webinars about options for use during rotations and in blended classrooms (Dreambox Learning, Inc., 2023), there were no clear accountability structures in place to ensure teachers completed the asynchronous professional development. While some SCPS teachers did reference this as part of their professional development, it was not required professional development for all teachers. As previously described, *Dreambox Math* was not implemented for the first time when the division became a 1:1 device division. The math instructional specialist at the division recalled plans with *Dreambox Math* representatives being designed with a focus on training the school-based math specialists and maintaining relationships with vendors. This aligns with the interview findings that reflect that teachers and principals did not participate in professional development on *Dreambox Math* during the 2021-22 school year, but that math specialists did participate in *Dreambox Math* professional development, at least at the onset of the school year.

Research Question 4b.

WHAT WAS THE RELATIONSHIP BETWEEN SCHOOL SUPPORTS AND TEACHERS' IMPLEMENTATION OF DREAMBOX MATH?

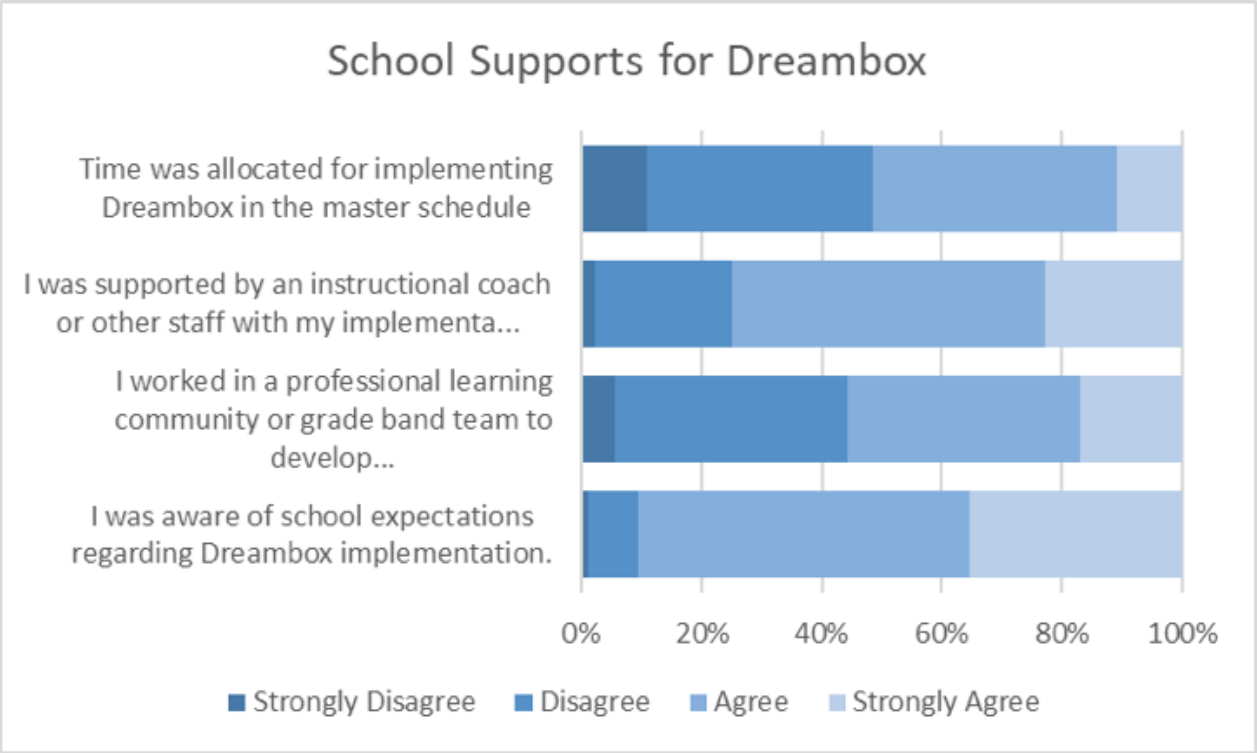
Principals matter. *Dreambox Math* was not supported at the school level because principals lacked knowledge and understanding of the program.

Dreambox

Finally, it was important to determine whether or not school supports – defined as clear expectations, professional learning communities, administrator or coach walk-through feedback, and modeling of lessons – were associated with teachers' *Dreambox Math* implementation. Based on survey responses from 164 K-5 teachers in SCPS, 38% were aware of school expectations to implement *Dreambox Math* in their classrooms, while 19% indicated that school administrators built time into the master schedule, 27% indicated that they worked in a PLC or grade band team to implement *Dreambox Math*, and 30% indicated that they were supported by a math specialist, instructional resource teacher, or a school administrator with the implementation of *Dreambox Math* throughout the school year. See Figure 9 for more information. These percentages from the survey suggest that teachers did not receive as much support with implementing *Dreambox Math* as they did with *Lexia Core5 Reading*, which could be linked to the findings regarding a lack of professional development.

Figure 9

Descriptive Statistics on Dreambox Math School Support Survey Responses (n=164)

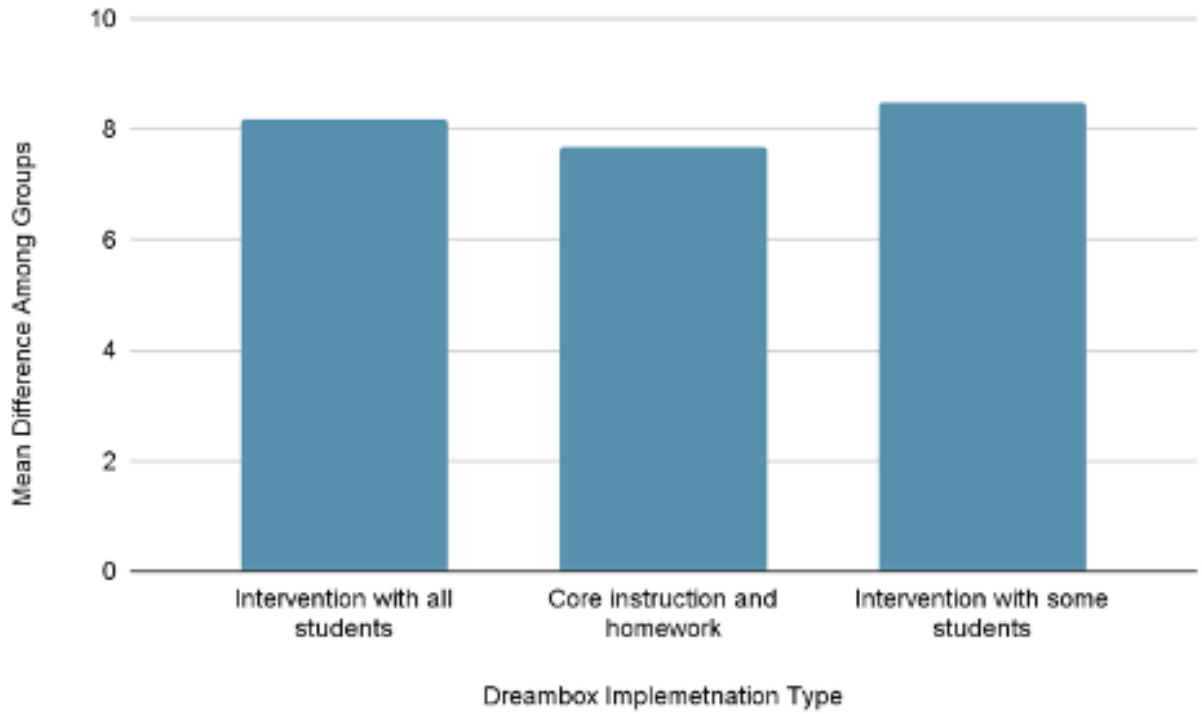


A one-way ANOVA test was performed to determine if there were differences in how teachers implemented *Dreambox Math* based on school support. The results of the one-way ANOVA showed that there was no statistically significant difference in how teachers implemented *Dreambox Math* and the school support provided ($F(2,121)=1.725$, $p>.05$). See Appendix H. As shown in Figure 10 below, the mean values are similar in all categories, and the difference noted is not statistically significant. These results are very similar to *Lexia Core5 Reading* results which highlight the lack of expectations around both digital resources from the division level that trickled down to the school level.

According to central office personnel that were interviewed, the Curriculum and Instruction department provided training to the math specialists and created a resources hub for school leaders and teachers, but they do not provide expectations around using any materials or resources. According to one central office member, there is a "central hub of curriculum guidance documents that everyone has access to; content coaches meet with coordinators regularly. There is a funnel from the coordinators to the coaches to the teachers; there's also a funnel from the coordinators and executive directors to principals to teachers." Another noted, "Structures looked a bit different, depending on the school."

Figure 10

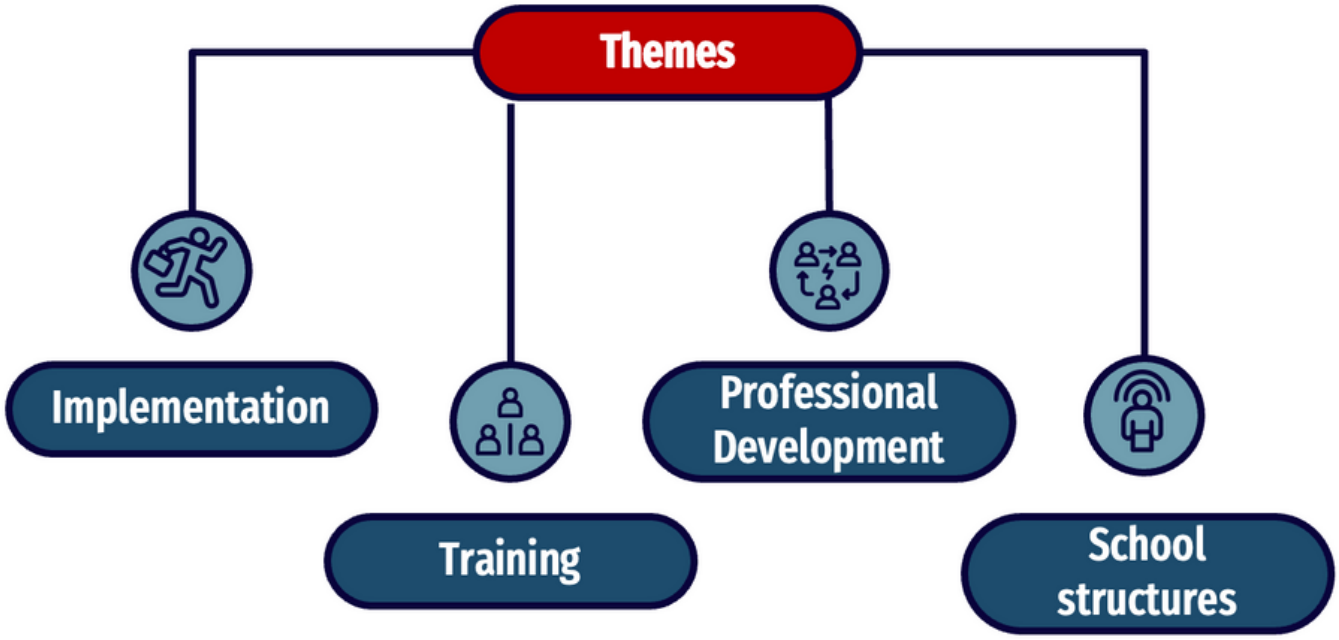
School Support Differences Based on Dreambox Math Implementation



Like *Lexia Core5 Reading*, school supports were inconsistent and relied heavily upon school leadership. As noted above, during principal interviews, not one principal referenced knowing or understanding *Dreambox Math*. One principal indicated, "School-based admin was not a part of Dreambox PD…this went directly through math specialists." Another principal lamented, "Dreambox does not have a school-level view like Lexia; only a teacher-level view." If principals are expected to design professional development and expectations for an instructional program and support teachers, then their knowledge of the program, as well as their knowledge of effective professional development, needs to be quite significant (Nelson, 1998). The principals of the five elementary schools in SCPS, where interviews were conducted, did not know much about *Dreambox Math*. This highlights the intersection of professional development and school supports. The lack of professional development prevented principals from creating systems and processes to support teachers in implementing *Dreambox Math*.

DISCUSSIONS

Digital instructional resources have become increasingly common in elementary schools. This study sought to assess the implementation of two resources – *Lexia Core5 Reading* and *Dreambox Math* in SCPS during the 2021-22 school year. The discussion is organized thematically, focusing on implementation, training, professional development, and school structures.



Implementation of *Lexia Core5 Reading* and *Dreambox Math*

The mixed-methods implementation study found there needed to be more consistent implementation of *Lexia Core5 Reading* and *Dreambox Math* by SCPS schools and teachers.

SCPS had schools that were using Lexia Core5 Reading before the start of the COVID-19 pandemic; however, it was not a division-wide contract. As the division shifted to a 1:1 device model, it also invested in division-wide contracts for digital instructional resources. This practice was common across the United States as districts responded to school closures prompted by the COVID-19 pandemic. The rigorous, personalized, structured, and systematic features of *Lexia Core5 Reading* made it a logical choice for implementation in a time of need (March 2020-2021) and throughout the following challenging school year (SY 2021-22). The Chief Learning Officer of Lexia acknowledged the blended learning features of Lexia products as a rationale for their ease of implementation during the COVID-19 pandemic (Hogan, 2020, 5:18). However, even with national pre-pandemic use of the blended learning features, SCPS elementary schools experienced inconsistent implementation of *Lexia Core5 Reading* in SY 2021-22.

There is much that districts and researchers can continue to explore around the implementation of digital instructional resources, including, but not limited to, how a district messages expectations around implementation and the alignment or adherence to published implementation guidance.

Training on *Lexia Core5 Reading* and *Dreambox Math*

Extant literature reflects the goal of training as "modifying the capacities of those who receive it; simply put, those who have been "trained" are (hopefully) able to do things they could not before" (Allen et al., 2022). With the goal of implementation, the *Lexia Core5 Reading* training achieved its purpose. However, the implementation can be characterized only as teachers using the digital instructional resource with their students. The results of this implementation evaluation corroborate the research demonstrating a connection between training and implementation. Additional research is necessary to determine the most effective timing and format for training using digital instructional resources.

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While there may have been some *Lexia Core5 Reading* training, it was found that little to no training occurred on *Dreambox Math* during the 2021-22 school year. While *Dreambox Math* had been in use across some schools in the division before the 2021-22 school year, the training provided during this school year was little to none. Some teachers recalled training occurring in prior years when their school first adopted the digital instructional resource. However, the timing or lack of training may have had a relationship to the implementation of *Dreambox Math*. Teachers did not report that there was training during the 2021-22 school year on the implementation of *Dreambox Math*.

Extant research says that training that lacks connection to classroom practice can hinder technology implementation (Wells, 2007). It is unknown if the lack of 2021-22 school year training hindered the implementation of *Dreambox Math* or if there is another cause for the sporadic implementation of the resource. However, the researchers concluded that the lack of training had a relationship to the patterns of varied implementation. Further research on ongoing training as districts continue using digital instructional resources will support implementation as districts explore how to continue or modify vendor contracts.

Professional Development on *Lexia Core5 Reading* and *Dreambox Math*

Professional development is a highly effective tool to influence and transform teachers' practice. The context in which professional development needs are determined and then the timing and format in which professional development is delivered significantly impacts its effectiveness. Yoon and colleagues (2007) found that the tipping point is more than 14 hours of professional development for a positive and significant effect on student achievement (p.5). In SCPS, the researchers found that principals determined professional development needs at the school level, creating inconsistencies across the division and variance in how teachers used *Lexia Core5 Reading* in their classrooms. Extant literature says professional development is key to the implementation of instructional resources regardless of format. The ongoing professional development teachers in SCPS received relied heavily on school-based PLCs.

Professional development is most effective when it reflects the principles of adult learning (Knowles, 1980). The interviews did not provide evidence that the professional development on *Lexia Core5 Reading* reflected these principles. Principals determined the professional development and may have been provided in formats that did not reflect adult learning theory due to the timing and limitations of evolving protocols around COVID-19.

The hallmark of effective professional development is its impact on teachers. Bendtsen and colleagues (2022) found that

effective professional development has the power to provide teachers with the knowledge that can boost their self-confidence and make them feel empowered.

Additional research about professional development features for digital instructional resources could provide principals and districts with guidance on planning for professional development targeting the effective implementation of *Lexia Core5 Reading* and *Dreambox Math*. Additionally, research could strengthen the possible structures and opportunities for professional development using *Lexia Core5 Reading* and *Dreambox Math* aligned to the recommended implementation.

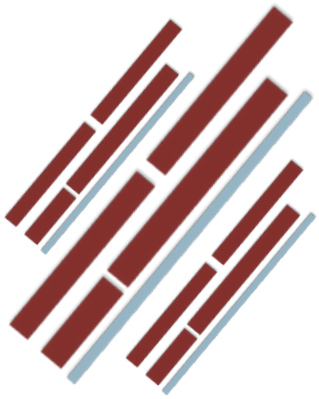
The importance of professional development is further highlighted by the lack of professional development for the implementation of *Dreambox Math*. Although *Dreambox Math* has resources on its website, including webinars about options for use during rotations and in blended classrooms (Dreambox Learning, Inc., 2023). While some SCPS teachers did reference this as part of their professional development, it was not required professional development for all teachers. As previously described, *Dreambox Math* was not implemented for the first time when the division became a 1:1 device division. The math instructional specialist at the division recalled plans with *Dreambox Math* representatives being designed with a focus on training the school-based math specialists and maintaining relationships with vendors. This aligns with the survey findings that reflect that school staff, including teachers, did not participate in professional development on Dreambox Math during the 2021-22 school year. One teacher from Rockhill elementary school said, "PD for Dreambox was more like a check the box type of thing."

The extant research indicates that there are seven features of effective professional development: it is content-focused, incorporates active learning, supports collaboration, uses models of effective practice, provides coaching and expert support, offers feedback and reflection, and sustained duration (Darling-Hammond et al., 2017). Survey results and interviews from SCPS do not demonstrate that professional development on *Dreambox Math* in SCPS included these seven features. However, the division did not share professional development plans for *Dreambox Math* or L*exia Core5 Reading*.

Additional research is necessary to understand the most effective professional development for digital instructional resources, especially as supplemental to the core curriculum. Emerging research on the TPACK framework could be used to guide professional development on technology features of digital instructional resources, especially for blended learning options. The TPACK framework "focuses on technological knowledge (TK), pedagogical knowledge (PK), and content knowledge (CK), [and] offers a productive approach to many of the dilemmas that teachers face in implementing educational technology (edtech) in their classrooms" (Kurt, 2018).

School Supports for *Lexia Core5 Reading* and *Dreambox Math*

The findings of this implementation evaluation confirm extant research on clear expectations. In schools where principals provided clear expectations, teachers expressed knowing these expectations. Despite survey responses that suggested a higher utilization of *Lexia Core5 Reading* than we expected based on our initial conversations with SCPS leaders, we found that only some schools had clear school structures, such as a quantifiable expectation/goal of usage for students. However, there was no clear understanding of how and when teachers were expected to implement these digital instructional resources. The results of the survey demonstrate that there is no relationship between school supports and the implementation of *Lexia Core5 Reading*. This provides an area for additional research, especially to determine if there is a particular school support or combination of school supports that have a relationship to the implementation of *Lexia Core5 Reading*.



Generalizing to all digital instructional resources, more research is needed on the role of school leadership and the leader's knowledge of programs to inform clear expectations, professional learning communities, and feedback. These are the school supports that the researchers identified, asked about in the survey, and listened for in interviews. In fact, one principal said that the professional development went through the math specialists, and principals did not have knowledge of it. Yet, another principal referenced that the school's instructional leadership team made decisions about the implementation of *Dreambox Math*. However, it is not known if all members of the instructional leadership team had the same knowledge of the digital instructional resource or if they relied on the math specialist's expertise.

Extant research says that leadership matters for the successful implementation of curriculum (Bryk et al., 2015; Hallinger, 2011). To further the research around digital instructional resources for math instruction, an analysis of the role of school administrators in the implementation would be valuable. Knowledge of instructional resources cannot be limited only to the teachers and instructional coaches but needs to also include administrators as the instructional leaders of the building. Ownership of this collective understanding allows for clarity in expectations on the implementation of the resource.

Further research on school structures and the cohesiveness with professional development provides an exciting area to explore with digital instructional resources. As many districts have adopted a 1:1 device model due to the COVID-19 pandemic, the use of digital instructional resources is likely a sustaining feature of curricular packages in K-12 education. There is increasing opportunity for researchers to understand how to support districts with the planning for training, professional development, and school supports with the greatest ability to support the implementation of digital instructional resources.

LIMITATIONS

This study has limitations; therefore, the findings should be interpreted carefully. Limitations are detailed below.

Survey

The limitations of this study center around the survey distribution. The SCPS Director of Research, Evaluation, and Strategic Improvement distributed the survey to all elementary schools. This posed a couple of different issues for the survey administration. First, the survey was intended for certified teachers in all elementary schools. Because the survey was sent to all staff, paraprofessionals and other staff members took the survey. Since the survey captured other individuals outside of certified teachers, there was an impact on the response rate. Two hundred and thirty-five staff members took the survey, leading to a response rate of 26%. Of those 235, responses varied by each question; thus, the assumption is that responses were based on the respondent's ability to respond to the questions. During qualitative interviews, the researchers heard information that led them to believe that paraprofessionals may have responded to some of the questions. While the information obtained from the paraprofessionals may be accurate, the responses may not be generalizable to all teachers; thus, a limitation of the survey.

During interviews, the researchers heard from some teachers that paraprofessionals worked directly with students using *Lexia Core5 Reading* and *Dreambox Math*. Due to the researchers' lack of awareness of the role of paraprofessionals as interventionists before administering the survey, it is impossible to determine the specific schools that trained paraprofessionals on *Lexia Core5 Reading* and *Dreambox Math* or utilized them as interventionists, thus creating another limitation. The researchers were unaware of this before administering the survey; therefore, they cannot determine which schools trained paraprofessionals on *Lexia Core5 Reading* and *Dreambox Math* or used paraprofessionals as interventionists.

Secondly, because the survey was distributed centrally, the response rates by school were skewed, which poses a threat to the external validity. For instance, one elementary school had 30 responses, while another had six responses. Finally, the survey did not ask for demographic information of respondents, which limits the generalizability of the results. It is unknown if the survey respondents are representative of the district or representative of teachers using *Lexia Core5 Reading* or *Dreambox Math* nationally. Because the researchers did not include race, gender, or years of experience as survey questions, it was impossible to conclude if there is a relationship between these demographic characteristics and the implementation of *Lexia Core5 Reading* or *Dreambox Math*.

It is also important to note that the survey was voluntary, without reward or acknowledgment. Hence, the participants who chose to take the survey may have been intrinsically motivated to share their experience with *Lexia Core5 Reading* and/or *Dreambox Math*, thus resulting in selection bias. The respondents' motivation to complete the survey could have been their strong like or dislike for either *Lexia Core5 Reading* or *Dreambox Math*, which increases the likelihood of skewed results.

One improvement to the survey the researchers identified was that school supports was not clearly defined in the survey. It should have been defined as clear expectations, professional learning communities, and time. Instead, the survey included all of these plus another item that asked about school supports in general. This creates a limitation in the reliability of the survey because the researchers do not know if respondents interpreted school supports in the way the researchers intended.

A final limitation regarding the survey is that some confusion may have existed between two variables in our survey: digital instructional resources implemented as part of core instruction with all students and/or digital instructional resources implemented as an intervention with all students. After the statistical analysis was completed, the researchers realized these two variables needed definitions in the survey to alleviate any confusion. The researchers recognize that we do not know how respondents perceived the difference between these two variables. In the cognitive interviews, this did not materialize as a concern; however, once qualitative interviews were conducted, the researchers realized that some respondents were not well-versed in the difference between core instruction and interventions for all students.

Interviews

Stafford County Public Schools' Director of Research, Evaluation, and Strategic Improvement chose the schools where the researchers conducted interviews, and the principals chose the staff who were interviewed; this is a limitation of this implementation evaluation. Both internal and external validity were jeopardized by selection bias resulting from the actions of the school division and principals. Because we used a biased sample, the comparison of association between populations (e.g., new teachers and veteran teachers) was affected. This is evident given that four out of five schools selected for interviews reported the highest survey responses. The researchers also do not know if the race/ethnicity or gender of the teachers who were interviewed are representative of their schools. The results of the interviews cannot be generalized because of the biased sample.

A second limitation of the interviews is the lack of diversity in the interview participants. The researchers did not interview any Special Education or Multi-Language Learner teachers, so the study did not represent those voices in the qualitative data. Because both *Lexia Core5 Reading* and *Dreambox Math* can be used as an intervention, both special education and multi-language learner teachers should have been interviewed to learn about their use of these digital instructional resources. This would then have allowed the researchers to compare similarities and differences between the implementation of Special Education and Multi-Language Learner teachers and general education teachers.

Another limitation to address is the timing of the interviews. The interviews were conducted in October and November of 2022, but the survey was based on the implementation of digital instructional resources during the 2021-22 school year. Respondents answered some questions based on how long they were in the district rather than focusing on the 2021-22 school year. For example, many of the teachers interviewed were veteran teachers and discussed the professional development they received in SCPS in previous years. *Lexia Core5 Reading* and *Dreambox Math* are not new resources to SCPS, and professional development was provided over several years prior to the 2021-22 school year.

The timing of the interviews also impacted the availability of teachers, and reading and math specialists. For example, there was a change in the school selected for interviews due to special education meetings. The availability of teachers and principals' selection of teachers amplified the selection bias of teachers for participation in interviews. While principals provided the breakdown of grades and subjects teachers taught, they did not share the additional rationale for selecting teachers for interviews.

While interview protocols were written for each role in SCPS, the researchers have varied educational backgrounds and probed differently based on their experience. This was particularly noticeable in the area of school support. One researcher has a background as an elementary school administrator and probed more deeply on feedback and coaching provided by the school administrator than the other two researchers. Because of this, some responses were varied, particularly at the two schools where this researcher interviewed school staff.

Given the limitations outlined with the survey and the interviews the researchers recommend the findings be interpreted cautiously.

RECOMMENDATIONS

The researchers developed recommendations for SCPS in four areas: implementation; professional development, school supports, and further evaluation. These recommendations focus on accountability and structural supports for *Lexia Core5 Reading* and *Dreambox Math*, as well as other curricular and instructional resource adoptions in the future.

Implementation: Use Provided Guidance

Digital instructional resources are similar to other curricular resources in that they come with recommendations for implementation. *Lexia Core5 Reading* recommendations for implementation are tiered based on student needs. As students use the program and ideally progress toward their targets, the recommended use time can change. Recommendations for use from *Lexia Core5 Reading* and *Dreambox Math* are included in earlier sections of this study.

SCPS did not provide implementation guidelines for minutes of use or lessons to be completed for schools, leading to a high degree of variability across and within schools. The researchers recommend that the programs be implemented as designed for the first year and then, with the guidance of the division literacy and math instructional specialists, make adaptations to the implementation plan. For schools to embrace implementation with fidelity, the guidance for implementation needs to come from the division in a coordinated effort from all departments, those supporting and those with accountability measures. Adaptations to implementation can be made based on students' use and teachers' recommendations within the division to address local context. Implementation of digital instructional resources can be conceptualized the same way as curriculum. Kurz et al. (2010) acknowledges that there is an intended curriculum, in this case, *Lexia Core5 Reading* and *Dreambox Math* as designed. The enacted curriculum is:

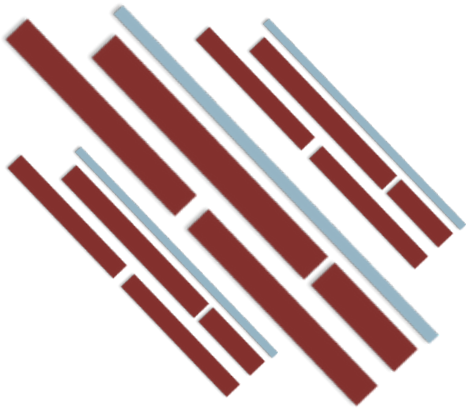
> "how teachers bring that content to life in their classroom [and] the attained curriculum refers to the understanding students actually gain during a lesson"
>
> -(Pak et al., 2020, p.1).

Implementation as intended before making adaptations provides for an increased level of fidelity and rigor.

Although *Lexia Core5 Reading* has been in use across the division in varying capacities for multiple years, it was not reported to have been implemented following the recommendations from the vendor. The researchers learned that multiple schools are using *Lexia Core5 Reading* and *Dreambox Math* for WIN ("what I need") time, or intervention time; this time is intended to close instructional gaps for students. For this reason, the implementation of the curriculum with fidelity is valuable.

> "When leaders attempted to develop their own materials instead of relying on published materials, they often misinterpreted the intentions of the standards, resurfacing the same issue of misaligned curricular resources"
>
> (Pak et al., 2020, p.3).

To address this risk of misinterpretation, the division needs to provide the guidance to school leaders and teachers for cohesive implementation expectations, guidance and accountability.



If teachers are making adaptations to the implementation of digital instructional resources, school leaders and district leaders need to consider how and who will support teachers to develop the expertise needed to implement the curriculum with fidelity or make adaptations that do not detract or minimize the possible achievement gains. Teachers are expected to have questions about how curriculum helps students to progress towards standards. School leaders need to plan for and provide supports, including coaching and professional learning communities, to guide teachers in making productive adaptations, rather than adaptations that could undermine the curriculum's rigor (Burkhauser & Lesaux, 2017). Guided adaptations allow teachers to ask questions supporting the implementation and promoting the highest possible achievement gains.

The researchers recommend that for any new instructional resource SCPS purchases, the division follow the implementation guidance from the vendor for year one. If the division plans to continue using *Lexia Core5 Reading* and *Dreambox Math*, working with the vendor to plan for implementation as recommended would provide consistency and coherence across the division. This is recommended if the division wants to use these digital instructional resources with WIN or intervention time to close instructional and skill gaps for students.

Professional Development and Training: Build Capacity of Teachers

Establishing an explicit professional development plan

To ensure that all SCPS teachers receive the professional development they need to teach their students effectively, SCPS should establish and utilize an explicit professional development plan. Professional development can cover many topics for a large school district, including new curriculum implementation, student assessment, technology integration, and social-emotional learning and practice. Without establishing a coherent plan, teachers may miss vital learning opportunities or engage in professional development that does not align with the division's overall aims and goals.

Furthermore, an overt professional development plan can establish a continuous improvement and learning culture among teachers (Darling-Hammond et al., 2009). This creates a working environment that can lead to higher teacher job satisfaction and morale, thus creating opportunities for improved outcomes regarding student achievement (Kimbrel, 2018).

Additionally, having a professional development plan that can be referenced for clarity and coherence provides an opportunity to ensure that the division's resources are utilized effectively. Using the framing of the district's strategic plan as a guide creates an opportunity for a district to take an economical approach to utilizing and allocating resources because it clearly aligns with the need and timing of professional development experiences. A district may consider multiple options, including partnerships, establishing in-house learning, and researching technology or tools when designing a professional development plan that would allow them to economize. By referencing the plan regularly, the district can ensure its resources are being used strategically, leading to greater efficiency and cost savings.

Differentiate between training and professional development plans

To equip teachers to best meet student needs, district leaders and those supporting school leaders must understand the difference between professional development and training plans. A training plan focuses on acquiring specific skills or knowledge, usually regarding a specific tool or resource. In contrast, a professional development plan focuses on improving teacher practice and creating paradigm shifts through ongoing and consistent growth, learning, and application (Rumberger, 2021). Understanding these differences is important because they can result in different teacher outcomes.

Training was effective when considering the COVID-19 pandemic and the urgent need to utilize tools or systems to implement schooling because it allowed teachers to learn new skills and knowledge in a time-bounded approach. A training plan typically does not provide an opportunity to establish ongoing growth and learning because it is usually a one-time experience. The learning of the skill, knowledge, or tool is addressed a single time or sporadically. Conversely, professional development plans establish a culture of continuous learning and improvement among teachers, which allows educators to grow in their teaching practice. For example, when considering technology-based digital instructional resources, like *Lexia Core5 Reading* and *Dreambox Math*, training focused on utilizing and implementing these tools. In contrast, professional development could have utilized the TPACK Framework to understand what knowledge teachers need to integrate technology into their classrooms and in conjunction with other curricular materials (Mishra & Koehler, 2006). The TPACK Framework "outlines how content (what is being taught) and pedagogy (how the teacher imparts that content) must form the foundation for any effective ed-tech integration" (Kurt, 2018).

Train-the-Trainer

One recommendation to SCPS is to adopt the train-the-trainer model to ensure consistency across the division with *Lexia Core5 Reading* and *Dreambox Math*. The train-the-trainer (TTT) model involves training a group of educators, typical division content leaders, or school-based content specialists or coaches, who then train other educators at the school level. The goal of the TTT model is to ensure that all educators are trained in a consistent and similar manner, which leads to a shared understanding of the content. In SCPS, the approach to TTT could be to implement the initial training with the literacy and math instructional specialist at the central office level, who then train the school-based content specialists collectively, who would then train educators on their specific campus.

Studies have shown that the TTT method not only builds capacity for professional development but also increases collaboration among educators and is cost-effective (Suhrheinrich, 2011; Lawless & Pellegrino, 2007).

Taking this approach in SCPS could support a shared understanding surrounding the implementation of *Lexia Core5 Reading* and *Dreambox Math*. Regarding *Lexia Core5 Reading*, a shared understanding of the recommended minutes per week by risk category for *Lexia Core5 Reading* by grade could be discussed, as well as an approach on how and during what specific blocks of time to use the program could facilitate fidelity of implementation. Regarding *Dreambox Math*, framing the shared understanding around the recommended number of lessons would provide teachers with the knowledge of how and when to use the program. This would inform when the resource can be used for independent work, versus pre-teaching or reteaching.

To successfully implement the TTT model in a school district, it is important to have a thorough and comprehensive training for the initial group of educators who will implement the training with others. Trainers should understand the content but also understand adult learning theory (see next recommendation), especially the effective strategies and techniques for teaching adult learners. Though there are some existing SCPS structures that already implement this (based on our central office interviews), the TTT model is not fully maximized. For SCPS to fully embody the TTT model, trainers must create clear expectations and a blueprint for facilitation, such as length of training, frequency of training, and a process for evaluation to gauge the effectiveness of the training (Kirkpatrick & Kirkpatrick, 2006).

Understanding adult learning theory

Another recommendation for SCPS is to understand professional development through adult learning theory, enabling the district to meet teacher needs. This includes incorporating aspects of evaluation or contributive planning interwoven into the design of any *Lexia Core5 Reading* or *Dreambox Math* professional development. Not a single educator interviewed mentioned an evaluation process or mechanism for Lexia Core5 Reading or Dreambox Math professional development or training, nor did the district leads produce any artifacts highlighting evaluative data on any past professional development opportunities.

Finally, research highlights the need for immediate application (Knowles, 1980), which was even more difficult to accomplish when faced with equity barriers posed by interrupted instruction.

> Professional development that has direct and tangible application to work and their performance can better engage teachers.

Many professional development opportunities for teachers work against the adult learning theory because they are uniform, occur sporadically, are mandatory, and do not support their daily practice.

School Supports: Create Structures Designed for Support and Accountability

To ensure teachers are supported in implementing new programs in SCPS in the future, the researchers recommend creating structures designed to support monitoring and accountability. Specifically, the division leadership needs to ensure there are clear division and school level expectations for implementing new programs, structure time within Professional Learning Communities intended for teachers to engage in best practices with the program and reflect upon the use and data obtained and create accountability structures to identify teachers who need support.

District and school expectations

Division level leaders should create and articulate clear guidance around expectations for using *Lexia Core5 Reading* and *Dreambox Math*, and any program purchased by the school division. While division level staff communicated clearly and coherently about *Lexia Core5 Reading* and *Dreambox Math*, they did not have the authority to hold principals accountable for implementing either digital resource. More coordination should occur among departments to ensure that the department with the expertise of the program provides guidance while the department with authority for accountability provides the expectations to school principals. There must be coordination between these two for coherence. As stated previously, this guidance should be based on the vendors' research and guidance documents.

In Robinson's Student-Centered Leadership, Robinson researched the impact of school principals on student achievement and found that five leadership domains had significant effect sizes on student achievement. Establishing goals and expectations, with an effect size of .42, was the second highest domain (Fullan, 2014; Robinson, 2011). With this research in mind, school principals should ensure that goals and expectations for instructional program use are clear to teachers. This clarity around goals and expectations can lead to improved student outcomes.

Structured Time

Once the division provides guidance around those expectations and the principals share the goals and expectations with teachers, the researchers would also recommend creating a structure during the school day for teachers to implement programs, specifically *Lexia Core5 Reading* and *Dreambox Math*. There are current models that can be studied within SCPS to determine their effectiveness. For instance, one school has devoted WIN time to *Lexia Core5 Reading* and *Dreambox Math*. This structure could be duplicated in other schools if found to meet the needs of students.

Professional learning communities

As Dufour and Marzano stated, “time devoted to building the capacity of teachers to work in teams is far better spent than time devoted to observing individual teachers” (Fullan, 2014; DuFour & Marzano, 2009, p.67). With that in mind, the researchers would recommend that PLC time be devoted to discussing effective teaching practices and student experiences with these digital instructional resources. While every teacher we interviewed indicated that they participate in PLCs, they reported that *Lexia Core5 Reading* was only the focus quarterly during Data Dives; but this was inconsistent across schools. PLCs allow teachers to engage in the continuous improvement process, but only if they are provided guidance and expectations from school leaders about how to engage in continuous improvement.

The work of a PLC is driven, in part, by the recognition that a key factor for enhancing student learning is improved adult learning (DuFour et al., 2021). This corresponds with the earlier recommendation that school leaders understand adult learning theory. This is important for professional development, structuring PLCs, and coaching PLC leaders and instructional specialists to lead conversations around *Lexia Core5 Reading* and *Dreambox Math*. Along with this recommendation, allowing paraprofessionals to participate in PLCs to discuss their experiences would ensure that all voices are at the table. This is important since it was noted in both the qualitative and quantitative data that paraprofessionals assisted students with using both digital instructional resources. Providing paraprofessionals with the same knowledge and support as teachers through PLCs would maximize the potential gains from implementation across both roles.

Accountability structures

A final school support recommendation is for school leaders and specialists to provide feedback and coaching to teachers using the tools. Providing coaching and feedback to teachers integrating *Lexia Core5 Reading* and *Dreambox Math* in their instruction would provide support and determine areas for professional growth while holding teachers accountable for implementation. Robinson's research referenced previously, found that leading teacher learning and development has an effect size of .84 (Fullan, 2014; Robinson, 2011). Conducting coaching and feedback allows the school leader and instructional specialists to ensure coherence with the instructional programs. These two digital instructional resources should not be used in isolation but as a part of the overall instructional program.

In summation, effective school leaders monitor classroom instruction and the procedures put in place to improve it, such as teachers' use of cooperative planning time and the quality of professional development (Goldring et al., 2007).

Continuous Improvement: Role of Program Evaluations

The researchers conducted an implementation evaluation which now positions the division for future research opportunities. Future studies could evaluate how and if practitioners use digital instructional tools with fidelity. Subsequently, it would be valuable to conduct an impact evaluation and explore how the use of *Lexia Core5 Reading* and *Dreambox Math* affects students' overall reading and math achievement. This would allow the division to determine a return on investment and determine if the cost of the digital instructional resource is providing benefits and translating to students' academic gains.

Lexia Core5 Reading has conducted this type of evaluation in California, but SCPS provides the opportunity to look at a different type of district and assess the impact. In California, it was found that "schools with strong implementation had a higher percent of third grade students attaining overall proficiency (+3%) and proficiency in the domains of Reading (+3%), Writing (+3%), Listening (+3%), and Research (+3%) relative to schools that did not use Core5" (Impact of *Lexia Core5 Reading* in California Schools | Lexia, n.d.). It is important to note that all results were statistically significant in this study. Lexia considered schools with more than 50% of third grade students meeting their Core5 usage targets to be strong implementers (Impact of Lexia Core5 Reading in California Schools | Lexia, n.d.). This provides the template for an evaluation in SCPS using this definition of strong implementation and Virginia's annual proficiency measure.

Dreambox Math has promising but mixed results from a study with Harvard University, Howard County Public Schools, and Rocketship Charter Schools published in 2016 (Dreambox Learning Achievement Growth in the Howard County Public School System and Rocketship Education, 2016). The findings of this study speak to the need for implementation guidance aligned with usage recommendations. Few students in the study met their recommended usage; however, those students who spent more time on the digital instructional resource and used it as recommended saw greater gains (Dreambox Learning Achievement Growth in the Howard County Public School System and Rocketship Education, 2016).

It would be valuable to conduct an impact evaluation and explore how the use of *Lexia Core5 Reading* and *Dreambox Math* affects students' overall reading and math achievement.

Return on investment for division purchases of digital instructional resources can be conducted after determining if there is a correlation between the implementation of the tool and student achievement. ERS provides an outline for conducting a return on investment that asks the district to think systemically about student needs and identify the best resources to meet these needs (Frank & Hovey, 2014). While this contrasts the traditional way of thinking about return on investment for purchases within districts, this could present a powerful opportunity for SCPS under new leadership.

CONCLUSION

Using a mixed-methods approach, the researchers explored four research questions for each digital instructional resource. The mixed-methods approach triangulated survey data and usage reports from *Lexia Core5 Reading* and *Dreambox Math*, which were analyzed quantitatively alongside qualitative interviews.

The findings of these questions can be summarized by variability. The implementation of each of these digital instructional resources was inconsistent across schools and grade levels; however, there was a higher implementation of *Lexia Core5 Reading*. Training was not uniform for either *Lexia Core5 Reading* or *Dreambox Math*, leading to implementation variability. The researchers highlighted the distinction between training and professional development in the extant literature. Principals determined professional development at the school-level, creating inconsistencies in how teachers used *Lexia Core5 Reading*. There was a lack of professional development on *Dreambox Math*, which was related to inconsistent implementation. School supports did not have a relationship with the implementation of *Lexia Core5 Reading*; however, it was evident that school leadership mattered for *Dreambox Math*.

The researchers have a series of recommendations that expand upon the division's work and extend the implementation of the digital instructional resources the division has already invested in. The opportunities for extending practices in place, like grounding professional development in adult learning theory and the use of the Train-the-Trainer model for curriculum and digital instructional resources, can be applied to more than *Lexia Core5 Reading* and *Dreambox Math*.

This implementation evaluation confirmed extant research on the importance of adult learning theory and the characteristics of effective professional development. The researchers found how important clear and consistent expectations are for the implementation of digital instructional tools. As educators continue to learn from the impacts of the COVID-19 pandemic, interrupted instruction, and learning loss, it is valuable to provide guidance on how to implement digital instructional tools to meet the needs of students. Districts that committed to becoming 1:1 will continue investing in blended learning curricula and digital instructional resources to customize student instructional opportunities. Digital instructional resources as interventions can be integrated with the core curriculum as part of a coherent approach to instruction that targets acceleration and addresses learning loss or gaps in skills. Further research can explore this integration.

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APPENDICIES

Appendix A

Interview Protocol: Teacher

Intro

Hello, my name is _____ and I am a current graduate student at Vanderbilt University Peabody School of Education. Thank you for meeting with me today. To help me take notes, I would like to record (using Otter.ai) our conversation. Only the researchers working on this study will have access to the recordings which will be deleted after they are transcribed. Otherwise, all the info recorded today is confidential. This study is voluntary, so at any point of time we can stop if you choose. Okay?

Thank you for agreeing to participate.

This interview should last no longer than an hour, in which I will ask you several questions. If we begin to run out of time, I might have to interrupt you to move forward to finish the essential line of questioning. Sounds good?

I have asked you to speak with me today because you have been identified as an educator who can share a wealth of knowledge on teaching and learning, particularly around resources such as *Lexia Core5 Reading* and/or DreamBox Math. We seek to understand more about the implementation of the two digital resources, Lexia Core5 Reading and DreamBox Math, in all elementary schools in SCPS. To that end, our research team will explore these research questions:

Research Questions

1. To what extent are K-5 teachers using *Lexia Core5 Reading* and/or *DreamBox Math*?
2. To what extent is there a relationship between training on how to use *Lexia Core5 Reading* or *DreamBox Math* and how a teacher implements the program?
3. To what extent did *Lexia Core5 Reading* and *DreamBox Math* professional development impact K-5 teachers' implementation with the expectations for student use of *Lexia Core5 Reading* or *DreamBox Math*?
4. What is the relationship between school supports and teachers' implementation of *Lexia Core5 Reading* or *DreamBox Math*?

Our hope is that our research informs policies and practices, in SCPS and across other districts and states around the implementation of the digital instructional resources and the necessary professional development and support for implementation. Okay, let's get started.

Professional Background

- How long have you been a teacher? How long have you been a teacher at this school?
- What grade(s) and subject(s) do you teach/did you teach last year?
- How are teachers made aware of policies and expectations related to curriculum and instruction?

Professional Development

- What types of professional development activities did you participate in during the 2021-22 school year in general and those specific to digital instructional resources?
    - Probe: What were the goals for professional development?
    - Probe: How did you know the goals?
    - Probe: In person or asynchronous PD?
- When the school/district decides upon a change, for example, in policy or curriculum, how is the change supported with professional development opportunities for teachers
- What professional development on Lexia Core5 Reading have you received?
    - Probe: Who conducted the professional development? School personnel? District personnel? Vendor?
    - Probe: How many days of professional development were provided? Was it continuous? Who followed up with you regarding the professional development
    - Probe: Did you find the professional development relevant and useful? Why or Why not?
- What professional development on DreamBox Math have you received?
    - Probe: Who conducted the professional development? School personnel? District personnel? Vendor?
    - Probe: How many days of professional development were provided? Was it continuous? Who followed up with you regarding the professional development
    - Probe: Did you find the professional development relevant and useful? Why or Why not?

Lexia Core5 Reading

- Were you provided specific expectations around using Lexia Core5 Reading in your classroom?
    - Probe: How was this communicated?
    - Probe: How were you held accountable for meeting this expectation?
    - Probe: Throughout the 2021-22 school year, did anyone follow up with you about implementing Lexia Core5 Reading in your classroom?
- Did you provide specific expectations around the use of Lexia Core5 Reading in your classroom?

- Probe: How was this communicated?
- Probe: How did you hold students and families accountable for meeting this expectation?
- Probe: Have you had conversations with students about their progress in Lexia Core5 Reading? Do you review reports with students and families?

DreamBox Math

- Were you provided specific expectations around using DreamBox Math in your classroom?
  - Probe: How was this communicated?
  - Probe: How were you held accountable for meeting this expectation?
  - Probe: Throughout the 2021-22 school year, did anyone follow up with you about implementing DreamBox Math in your classroom?
- Did you provide specific expectations around the use of DreamBox Math in your classroom?
  - Probe: How was this communicated?
  - Probe: How did you hold students and families accountable for meeting this expectation?
  - Probe: Have you had conversations with students about their progress in DreamBox Math? Do you review reports with students and families?

School Support

- How have you been supported with integrating Lexia Core5 Reading and DreamBox Math in your classroom?
  - Probe: Have you received feedback from instructional coaches and/or administrators? Was this feedback helpful?
  - Probe: Have you collaborated with your colleagues about Lexia Core5 Reading? DreamBox Math?
  - Probe: Has anyone from Central Office visited your classroom and provided feedback on the integration of Lexia Core5 Reading? DreamBox Math? Was it helpful?
- Was there a structured or dedicated time in the school day for Lexia Core5 Reading? DreamBox Math?
  - Probe: if yes, who provided the schedule? How were you held accountable for implementing Lexia Core5 Reading during this scheduled time? What about DreamBox Math?

Other Information

- Do you think Lexia Core5 Reading had a positive impact on your students?
    - Probe: Can you think of a particular success story?
    - Probe: Can you think of a particular unsuccessful story?
- Do you think DreamBox Math had a positive impact on your students?
    - Probe: Can you think of a particular success story?
    - Probe: Can you think of a particular unsuccessful story?
- Would you like to keep using Lexia Core5 Reading?
    - Probe: Why or why not?
- Would you like to keep using Lexia Core5 Reading?
    - Probe: Why or why not?

Interview Protocol: Instructional Specialist

Intro

Hello, my name is _____ and I am a current graduate student at Vanderbilt University Peabody School of Education. Thank you for meeting with me today. To help me take notes, I would like to record (using Otter.ai) our conversation. Only the researchers working on this study will have access to the recordings which will be deleted after they are transcribed. Otherwise, all the info recorded today is confidential. This study is voluntary, so at any point of time we can stop if you choose. Okay?

Thank you for agreeing to participate.

This interview should last no longer than an hour, in which I will ask you several questions. If we begin to run out of time, I might have to interrupt you to move forward to finish the essential line of questioning. Sounds good?

I have asked you to speak with me today because you have been identified as an educator who can share a wealth of knowledge on teaching and learning, particularly around resources such as Lexia Core5 Reading and/or DreamBox Math. We seek to understand more about the implementation of the two digital resources, Lexia Core5 Reading and DreamBox Math, in all elementary schools in SCPS. To that end, our research team will explore these research questions:

Research Questions

1. To what extent are K-5 teachers using *Lexia Core5 Reading* and/or *DreamBox Math*?
2. To what extent is there a relationship between training on how to use *Lexia Core5 Reading* or *DreamBox Math h* and how a teacher implements the program?
3. To what extent did *Lexia Core5 Reading* and *DreamBox Math* professional development impact K-5 teachers' implementation with the expectations for student use of *Lexia Core5 Reading* or *DreamBox Math*?
4. What is the relationship between school supports and teachers' implementation of *Lexia Core5 Reading* or *DreamBox Math*?

Our hope is that our research informs policies and practices, in SCPS and across other districts and states around the implementation of the digital instructional resources and the necessary professional development and support for implementation.

Okay, let's get started.

Professional Background

- How long have you been an instructional coach? How long have you been an instructional coach at this school? Or in this division?
- In general, what is the vision for student learning at this school?
- In general, what is the vision for utilizing digital instructional tools at this school?
- How are teachers made aware of policies and expectations related to curriculum and instruction? School level? Division level?

Professional Development

- What types of professional development activities do you provide for teachers in general and specifically on digital instructional resources?
    - Probe: What were the goals for professional development?
    - Probe: How were the goals determined?
- When the school/division decides upon a change, for example, in policy or curriculum, how is the change supported with professional development opportunities for teachers?
- Did you participate in professional development on Lexia Core5 Reading? DreamBox Math?

Lexia Core5 Reading

- Did central office personnel provide specific expectations around using Lexia Core5 Reading in elementary schools?
    - Probe: How was this communicated?
    - Probe: How were you held accountable for meeting this expectation?
    - Probe: Throughout the 2021-22 school year, did the division follow up with you about implementing Lexia Core5 Reading at your elementary school?
- Did your school administration provide specific guidance around the use of Lexia Core5 Reading in this school?
    - Probe: How was this communicated?
    - Probe: How were teachers held accountable for meeting this expectation?
    - Probe: Have you had conversations with any teachers about the integration of Lexia Core5 Reading into their daily lessons?
- Considering the 2021-22 school year, who provided the teachers with professional development on Lexia Core5 Reading?
    - Probe: How do you know they were experts in Lexia Core5 Reading?
    - Probe: What relationship did your school have with the vendor for Lexia Core5 Reading?

DreamBox Math

- Did central office personnel provide specific expectations around using DreamBox Math in elementary schools?
    - Probe: How was this communicated?
    - Probe: How were you held accountable for meeting this expectation?
    - Probe: Throughout the 2021-22 school year, did the division follow up with you about implementing DreamBox Math at your elementary school?
- Did you provide specific guidance around the use of DreamBox Math in this school?
    - Probe: How was this communicated?
    - Probe: How were teachers held accountable for meeting this expectation?
    - Probe: Have you had conversations with any teachers about the integration of DreamBox Math into daily lessons?
- Considering the 2021-22 school year, who provided the teachers with the training on DreamBox Math?
    - Probe: How did you know they were experts in DreamBox Math?
    - Probe: What relationship did your school have with the vendor for DreamBox Math?

School Support

- How do you support teachers in the integration of Lexia Core5 Reading and DreamBox Math?
    - Probe: Role in providing materials/resources
    - Probe: Type of feedback provided to teachers
- Who else in the school or division supported the teacher in integrating Lexia Core5 Reading and DreamBox Math?
    - Probe: How did central office personnel provide support to teachers?
- Was there a structured or dedicated time for students to use Lexia Core5 Reading during the school day? DreamBox Math?
    - Probe: if yes, who provided the schedule? How were teachers held accountable for implementing Lexia Core5 Reading during this scheduled time? What about DreamBox Math?

Interview Protocols: Principal

Intro

Hello, my name is _____ and I am a current graduate student at Vanderbilt University Peabody School of Education. Thank you for meeting with me today. To help me take notes, I would like to record (using Otter.ai) our conversation. Only the researchers working on this study will have access to the recordings which will be deleted after they are transcribed. Otherwise, all the info recorded today is confidential. This study is voluntary, so at any point of time we can stop if you choose. Okay?

Thank you for agreeing to participate.

This interview should last no longer than an hour, in which I will ask you several questions. If we begin to run out of time, I might have to interrupt you to move forward to finish the essential line of questioning. Sounds good?

I have asked you to speak with me today because you have been identified as an educator who can share a wealth of knowledge on teaching and learning, particularly around resources such as Lexia Core5 Reading and/or DreamBox Math. We seek to understand more about the implementation of the two digital resources, Lexia Core5 Reading and DreamBox Math, in all elementary schools in SCPS. To that end, our research team will explore these research questions:

Research Questions

1. To what extent are K-5 teachers using *Lexia Core5 Reading* and/or *DreamBox Math*?
2. To what extent is there a relationship between training on how to use *Lexia Core5 Reading* or *DreamBox Math* and how a teacher implements the program?
3. To what extent did *Lexia Core5 Reading* and *DreamBox Math* professional development impact K-5 teachers' implementation with the expectations for student use of *Lexia Core5 Reading* or *DreamBox Math*?
4. What is the relationship between school supports and teachers' implementation of *Lexia Core5 Reading* or *DreamBox Math*?

Our hope is that our research informs policies and practices, in SCPS and across other districts and states around the implementation of the digital instructional resources and the necessary professional development and support for implementation.

Okay, let's get started.

Professional Background

- How long have you been principal? How long have you been a principal at this school?
- In general, what is the vision for student learning at this school?
- In general, what is the vision for utilizing digital instructional tools at this school?
- How are teachers made aware of policies and expectations related to curriculum and instruction? School level? Division level?

Professional Development

- What types of professional development activities do you provide for teachers in general and specifically on digital instructional resources?
    - Probe: What were the goals for professional development?
    - Probe: How were the goals determined?
- When the school/division decides upon a change, for example, in policy or curriculum, how is the change supported with professional development opportunities for teachers?
- Did you participate in professional development on Lexia Core5 Reading? DreamBox Math?

Lexia Core5 Reading

- Did central office personnel provide specific expectations around using Lexia Core5 Reading in elementary schools?
    - Probe: How was this communicated?
    - Probe: How were you held accountable for meeting this expectation?
    - Probe: Throughout the 2021-22 school year, did the division follow up with you about implementing Lexia Core5 Reading at your elementary school?
- Did you provide specific expectations around the use of Lexia Core5 Reading in this school?
    - Probe: How was this communicated?
    - Probe: How were teachers held accountable for meeting this expectation?
    - Probe: Have you had conversations with any teachers about the integration of Lexia Core5 Reading into their daily lessons?
- Considering the 2021-22 school year, who provided the teachers with professional development on Lexia Core5 Reading?
    - Probe: How do you know they were experts in Lexia Core5 Reading?

DreamBox Math

- Did central office personnel provide specific expectations around using DreamBox Math in elementary schools?

- Probe: How was this communicated?
- Probe: How were you held accountable for meeting this expectation?
- Probe: Throughout the 2021-22 school year, did the division follow up with you about implementing DreamBox Math at your elementary school?

- Did you provide specific expectations around the use of DreamBox Math in this school?
  - Probe: How was this communicated?
  - Probe: How were teachers held accountable for meeting this expectation?
  - Probe: Have you had conversations with any teachers about the integration of DreamBox Math into daily lessons?
- Considering the 2021-22 school year, who provided the teachers with the training on DreamBox Math?
  - Probe: How did you know they were experts in DreamBox Math?

School Support

- How do you support teachers in the integration of Lexia Core5 Reading and DreamBox Math?
  - Probe: Role in providing materials/resources
  - Probe: Type of feedback provided to teachers
- Who else in the school or division supported the teacher in integrating Lexia Core5 Reading and DreamBox Math?
  - Probe: How did instructional coaches provide support to teachers?
  - Probe: How did central office personnel provide support to teachers?
- Was there a structured or dedicated time for students to use Lexia Core5 Reading during the school day? DreamBox Math?
  - Probe: if yes, who provided the schedule? How were teachers held accountable for implementing Lexia Core5 Reading during this scheduled time? What about DreamBox Math?

Interview Protocol: Central Office Staff

Intro

Hello, my name is _____ and I am a current graduate student at Vanderbilt University Peabody School of Education. Thank you for meeting with me today. To help me take notes, I would like to record (using Otter.ai) our conversation. Only the researchers working on this study will have access to the recordings which will be deleted after they are transcribed. Otherwise, all the info recorded today is confidential. This study is voluntary, so at any point of time we can stop if you choose. Okay?

Thank you for agreeing to participate. This interview should last no longer than an hour, in which I will ask you several questions. If we begin to run out of time, I might have to interrupt you to move forward to finish the essential line of questioning. Sounds good?

I have asked you to speak with me today because you have been identified as an educator who can share a wealth of knowledge on teaching and learning, particularly around resources such as Lexia Core5 Reading and/or DreamBox Math. We seek to understand more about the implementation of the two digital resources, Lexia Core5 Reading and DreamBox Math, in all elementary schools in SCPS. To that end, our research team will explore these
research questions:

Research Questions

1. To what extent are K-5 teachers using *Lexia Core5 Reading* and/or *DreamBox Math*?
2. To what extent is there a relationship between training on how to use *Lexia Core5 Reading* or *DreamBox Math* and how a teacher implements the program?
3. To what extent did *Lexia Core5 Reading* and *DreamBox Math* professional development impact K-5 teachers' implementation with the expectations for student use of *Lexia Core5 Reading* or *DreamBox Math*?
4. What is the relationship between school supports and teachers' implementation of *Lexia Core5 Reading* or *DreamBox Math*?

Our hope is that our research informs policies and practices, in SCPS and across other districts and states around the implementation of the digital instructional resources and the necessary professional development and support for implementation.

Okay, let's get started.

Professional Background

- How long have you been in your role? How long have you been in a Division Office role?
- In general, what is the vision for student learning in the division?
- In general, what is the vision for utilizing digital instructional tools in the division?

- How are principals and teachers made aware of policies and expectations related to curriculum and instruction? School level? Division level?

Professional Development

- What types of professional development activities do you provide for teachers in general and specifically on digital instructional resources?
    - Probe: What were the goals for professional development?
    - Probe: How were the goals determined?
    - Probe: Did you provide professional development on Lexia Core5 Reading and/or DreamBox Math? Did your colleagues who had these roles previously provide professional development on Lexia Core5 Reading and/or DreamBox Math?
- When the school/division decides upon a change, for example, in policy or curriculum, how is the change supported with professional development opportunities for teachers?
- Did you participate in professional development on Lexia Core5 Reading? DreamBox Math?
- Describe the relationship with the vendors in planning and delivering professional development for Lexia Core5 Reading and DreamBox Math to teachers, coaches and principals.

Lexia Core5 Reading

- Did central office personnel provide specific expectations around using Lexia Core5 Reading in elementary schools?
    - Probe: How was this communicated?
    - Probe: What were the accountability measures for meeting this expectation?
    - Probe: Throughout the 2021-22 school year, did the division follow up with schools about implementing Lexia Core5 Reading?
- Considering the 2021-22 school year, who provided the teachers with professional development on Lexia Core5 Reading?
    - Probe: How do you know they were experts in Lexia Core5 Reading?

DreamBox Math

- Did central office personnel provide specific expectations around using DreamBox Math in elementary schools?
    - Probe: How was this communicated?
    - Probe: What were the accountability measures for meeting this expectation?
    - Probe: Throughout the 2021-22 school year, did the division follow up with schools about implementing DreamBox Math?
- Did you provide specific expectations around the use of DreamBox Math in this school?
    - Probe: How was this communicated?
    - Probe: How were teachers held accountable for meeting this expectation?
    - Probe: Have you had conversations with any teachers about the integration of DreamBox Math into daily lessons?
- Considering the 2021-22 school year, who provided the teachers with the training on DreamBox Math?

- Probe: How did you know they were experts in DreamBox Math?

School Support

- How do you support teachers in the integration of Lexia Core5 Reading and DreamBox Math?
  - Probe: Role in providing materials/resources
  - Probe: Type of feedback provided to teachers
- Who else in the school or division supported the teacher in integrating Lexia Core5 Reading and DreamBox Math?
  - Probe: How did instructional coaches provide support to teachers?
- Was there a structured or dedicated time for students to use Lexia Core5 Reading during the school day? DreamBox Math?
  - Probe: if yes, who provided the schedule? How were teachers held accountable for implementing Lexia Core5 Reading during this scheduled time? What about DreamBox Math?

Appendix B

	Rockhill ES Teachers			
Bins/ Concepts	**Theme K-2**	**Key Quotes**	**Theme 3-5**	**Key Quotes**
DreamBox Math	Only asynchronous PD provided on the vendor website.		Self-guided PD, not vendor or school PD. 5 lessons a week	"PD for DreamBox Math was more like a check the box type of thing." "My students are more successful when I've assigned them lessons." "DreamBox Math is not intuitive, so my kids were frusterated."-5th grade
Lexia Core5 Reading	Vendor from Lexia Core5 Reading provided the PD.	"shows you the exact deficit the student has"-K teacher "minutes is not the same as improving levels, so it can be difficult to determine if students are growing." -K teacher "Vendor was extremely helpful... showed me how to use the program effectively and hopped on	Completed self-guided and virtual training with the vendor. Used Lexia Core5 Reading as homework. Direct instruction given if a lesson is flagged. Station in 21-22, not in 22-23	
Professional Development **Defined as "structured professional learning that results in changes to teacher knowledge and practices, and improvements in student learning outcomes." (Darling-Hammond, 2017)**	Mostly asynchronous; rather have face-to-face PD. New initiatives for Math and ELA are usually rolled out by the school coaches. Teacher are also involved in LETERS training.	"I know they are trying not to overwhelm us with PD, but we need it earlier."	Teachers had a voice in choosing the ELA curriculum	"Most PD provided by the coaches, so we have snippets here or there and most geared toward lower grades."-5th grade
School Supports **Includes interactions that include principal teacher interactions, including principals influence on sensemaking, and instructional practice. It also include structures such a PLCS and coaching.**	Structures in place for time-20 minutes per day. No coaching or feedback provided on either tool by admin. or coach.	"Coaches provide wonderful PD weekly" 2nd grade t	5th grade teacher used as a Tier 2 intervention. Used flagged lessons	

	Widewater ES Teachers			
Bins/ Concepts	**Theme K-2**	**Key Quotes**	**Theme 3-5**	**Key Quotes**
DreamBox Math	DreamBox Math professional development was years ago. pre-COVID- yes, there were expectations- 5 lessons complete by the end of the week. (Before COIVD- have kids on for 30 mins) During-COVID- no, not so much because equity (Lack of wifi, not sure how to save the progress) until they got over the computer hurdles Post-COVID- little less consistency due to tech problems and transporting Chromebooks (No specific goals for DreamBox Math) 22-23 school year- DreamBox Math once a week- Teacher set expectation No formal training. Not sure even how to help my kids on DreamBox Math, just know how to log-in	"It's difficult to look at an assessment that doesn't really correlate to DreamBox Math."	Teachers can pull lessons from other grade levels.	"DreamBox Math is challenging for students… it is not as clear as it needs to be for kids" 5th grade
Lexia Core5 Reading	Hard for students to log in to Lexia Core5 Reading -K teacher Lexia Core5 Reading implementation varies by grade level (homework, class station, intervention).	"PLC time was not dedicated to Lexia Core5 Reading, but quarterly data digs were...we just all knew it was a resource."	Number of minutes didn't make sense because the time as not necessarily valuable. 5th grade teacher Lexia Core5 Reading vendor was useful. 5th grade	
Professional Development **Defined as "structured professional learning that results in changes to teacher knowledge and practices, and improvements in student learning outcomes." (Darling-Hammond, 2017)**	LETRS PD occurred in 21-22, Discovery ED, Open Court-K teacher In person PD for Lexia Core5 Reading by the school reading specialist. DreamBox Math PD was conducted by someone in the division-K teacher	"Lately, because of Covid, PD has been more Canvas modules and self-paced." K teacher "Some of the PD was like a flahs course." 1st grade	Vendor PD from Lexia Core5 Reading and no PD for DreamBox Math.	
School Supports **Includes interactions that include principal teacher interactions, including principals influence on sensemaking, and instructional practice. It also include structures such a PLCS and coaching.**	Math and Reading coaches provided support through weekly PLCs, as needed-K teacher Admin recognized students and classes for Lexia Core5 Reading participation. No observations of teacher using the tools.	"The recognition of who had the most minutes in each grade level was fun...students are so excited when you print the certificates with their names." K teacher	IRT supports with DreamBox Math and Lexia Core5 Reading.	

	Falmouth ES Teachers			
Bins/ Concepts	**Theme K-2**	**Key Quotes**	**Theme 3-5**	**Key Quotes**
DreamBox Math	In PLCs with math coach, recommended to use a specific game; math coach checks on how many students are completing their 5 units; students make connections to what they see in DreamBox Math	"I tell them well, they have a few games that they can choose from and I tell them that they have to complete the game. They can't exit out of the game they have to try you know even if it's difficult."	Use DreamBox Math as part of daily math rotation or morning work; use for foundational skills, background knowledge; Last year was given as daily homework; 5 lessons per week.	"The teacher really has to go in and preview what the lesson looks like. A significant amount of the lessons that are listed as grade level are not in our curriculum and are way too hard."
Lexia Core5 Reading	Told how to access lessons and how to track students; literacy specialist shared expectations on Lexia Core5 Reading use; use Lexia Core5 Reading 15 to 20 mins per day; tracking both minutes and units completed and conferencing with students; used Lexia Core5 Reading as a station as one point but no longer; paras are the ones who print lessons and pull small groups to work with students on Lexia Core5 Reading; skillbuilder most referenced feature	Keep using Lexia Core5 Reading: "100% Yes. Why? Because of the data shows that is correlates to my student passing at the end of the year and it is reinforcing what they're learning in class and meeting them at their level. And it's helpful for me to track data."	Use the usage reports to monitor what level students are on; no change in how Lexia Core5 Reading is used in the class (pre/duing/post pandemic); last year given as daily homework; use for all students tier 1 and tier 2	"A couple of years ago students should be meeting their goal time. But we have found a flaw, I guess, in that. So what we have started with is units completed for students" "I like how Lexia Core5 Reading not only offers students the breakdown of phonics, spelling, syllabification, I mean everything. It is language oriented."
Professional Development **Defined as "structured professional learning that results in changes to teacher knowledge and practices, and improvements in student learning outcomes." (Darling-Hammond, 2017)**	PD on how to implement Lexia Core5 Reading effectively, track data; Lexia Core5 Reading PD was asynchronous; Lexia Core5 Reading vendor PD; been many years since DreamBox Math PD was helpful but could use more since things have changed	"To track the data to be able to know how our kids are progressing and so that we can know how to intervene"	weekly professional development, grade level instructional meetings, coaches help with ensuring that instruction aligns with standards and pacing; PD targeting developing reading comprehension and understanding; PLCs and grouping of students within the grade level	Lexia Core5 Reading PD initially done by the vendor and then by the reading specialist at the school
School Supports **Includes interactions that include principal teacher interactions, including principals influence on sensemaking, and instructional practice. It also include structures such a PLCS and coaching.**	PLCs with coaches; curriculum guides; emphasis on 5 lessons for both Lexia Core5 Reading and DreamBox Math per week but less incentives in tracking this year		reading and math specialists meet with grade level teams	"Principal voice funnels through the math specialist and reading specialist and they're the ones who say, here's these two programs, you need to be implementing them."

	Moncure ES Teachers			
Bins/ Concepts	Theme K-2	Key Quotes	Theme 3-5	Key Quotes
DreamBox Math	DreamBox Math professional development was years ago. pre-COVID- yes, there were expectations- 5 lessons complete by the end of the week. (Before COIVD- have kids on for 30 mins) During-COVID- no, not so much because equity (Lack of wifi, not sure how to save the progress) until they got over the computer hurdles Post-COVID- little less consistency due to tech problems and transporting Chromebooks (No specific goals for DreamBox Math) 22-23 school year- DreamBox Math once a week- Teacher set expectation No formal training. Not sure even how to help my kids on DreamBox Math, just know how to log-in	"No, because since COVID, we are scrambling to wow, where are you at?" " DreamBox Math was we want five lessons completed by the end of the week." "We had similar success as far as consistency however, it was not consistent across the board. We had more damage to technology, because it was moving. People were taking charters using them for other things. So Chromebooks were going dead. I can't find my charger. Because your mom's using it for her switch. Sorry. So inconsistent. So now this year. If we choose to send a Chromebook home, they've asked that we not send the technology and I'm only on board for that because I want to make home home again." "But do I know how they're teaching things in DreamBox Math? I do not. Okay. Do I know how to help my kids? I do not."	Pre/Post Use of DreamBox Math has been constant DreamBox Math is problematic Talk regarding expectations, but not enforced	" Okay, so the expectation for DreamBox Math has always been that students complete like the five lessons five units on DreamBox Math and that's been pre and post scoping, like that expectation hasn't changed yet." "So it's a I will spend more time explaining what DreamBox Math is trying to ask them to do." " I think that there is the talk of all your students need to be doing Lexia Core5 Reading and DreamBox Math but there's no expectation for them to do it." "Ive lessons in DreamBox Math per week and I I track them.
Lexia Core5 Reading	Pre-COVID- there were expectations for Lexia Core5 Reading (It was a center, instead of guiding reading) During-COVID- no, not so much because equity (Lack of wifi)- yes there were expectations- communicated from admin (held accountable because rule follower) Teacher set expectations 22-23 school year- Lexia Core5 Reading was not assigned for homework (Lexia Core5 Reading twice a week)	"20 minutes a day, communicated in the Bear Brief from my principal." " But as far as implementing DreamBox Math and Lexia Core5 Reading , it's a matter of I can barely meet these kids where they are, let alone work in these games, except from the high kids to extend them but it's like that seems almost punitive after a while and I want to be on that I want to do something different, you know," "So I made sure that my kids were on there for at least a 20 minute session." " I had my kids get on Lexia Core5 Reading at home two days a week last year, and then they had to do DreamBox Math two days a week so that I had some backup, because I don't always like to give up instructional time in my classroom to an online program."	Pre-COIVD- was not sure district-wide (limited licenses)- Four/Five years ago. COIVD- there was training, and started using it- 20-21- set up a reward system to utilize Lexia Core5 Reading from Leadership 22-23 No clear expectations (We are not implementing it fully)- Talk regarding expectations, but not enforced	" And then during COVID Yes, I communicated that message to my parents and my students that was like, oh, we need them to be getting on something." " And the research that I had read, unless full implementation was taking place. People were not having success and I read tons and tons and tons of studies about Lexia Core5 Reading. And I did bring that back and I said, you know, we we are we do not have the time or at least at our current structure at our county level, right. We do not have the current time that the implementation says like to have the full classroom. The what the research is saying that the minutes we would all need to spend doing this or don't have in our day correct. So we're going to keep what spinning our wheels and saying get on for 20 minutes a day. So now you're in my mind, you're losing 20 minutes. When we're not fully implementing the program. It doesn't make a lot of sense to me." " I keep my students at 16 unit 16 units per week and Lexia Core5 Reading."
Professional Development Defined as "structured professional learning that results in changes to teacher knowledge and practices, and improvements in student learning outcomes." (Darling-Hammond, 2017)	2021-2022- Letters Training (Started It) Before 21-22 received Orgo training No formal Lexia Core5 Reading Training Last Year (just a follow-up) Lexia Core5 Reading - Right before COVID, there was a training- Online for at least an hour ASOP PD Classes In Person before COVID In-house Lexia Core5 Reading Training- EPLC by reading Specialist Letters PD (Virtual)	"Okay, so it was involved and they showed you how to run reports and how to access this and then they were showing us Skill Builder lessons and they were showing us how you could project that and some of it came in handy when we did like tutoring like especially our reading personnel, our specialists would be like, Hey, this is a great idea."	Lexia Core5 Reading training through Google Meets (Led by someone from Lexia Core5 Reading) No DreamBox Math Training (its been like four or five years ago - it was no more 30 mins) Pre-Covid (years ago) - Went to conferences for ESAU, Self-PD PDs are a times lumped in with all grade	" Okay, so the 2021 year is tough because that's the year that COVID had us so when that happened, we did get some additional Lexia Core5 Reading training that was through Google a Google meet, okay."

School Supports Includes interactions that include principal teacher interactions, including principals influence on sensemaking, and instructional practice. It also include structures such a PLCS and coaching.	EPLC- Meet Weekly Mentorship (For New Teachers) Professional Development Days Trained Teacher Math Specialist/ Reading Specialist Paraprofessionals (None for Second Grade) Win time	" Here we have a really great PLC timeframe set aside where we meet weekly." " Oh, the math specialists was pulling like are we running our do we did we hear a lesson this is pre COVID." "Well, I do think a big part comes from our extended planning that we have. So there's always an admin person present. There's reading a math specialist present." "reading specialist much more than the math specialist. I have to incorporate it and then, you know, checking in with my friends. Yeah. What are you doing?	No clear expectations from the district level Leadership will "tell" expectations Collaboration with Colleagues	" I do not feel like there's a clear expectation from our district or at the school level." " I do have obviously friends around the county and they also communicate that they do not have their expectations their school which leads me to believe that our county then isn't giving clear expectations for usage."

	Parkridge ES Teachers			
Bins/ Concepts	Theme K-2	Key Quotes	Theme 3-5	Key Quotes
DreamBox Math	- No Specific DreamBox Math Training as New Teacher (2021-2022) - No Expectation for DreamBox Math, just encouraged - Teacher Expectations: Lesson- Don't hop around, finish the lesson	"So my new teacher week was during this time, and that was really good, and it did touch on some but I didn't have a specific Lexia Core5 Reading or DreamBox Math training." Not in Stafford. So it hasn't been to communicate because I don't really have specifics other than Hey, if you use a lot you're in dream box your class wins the award." "So in Stanford, this is great and just encourages us to use it as much. You know, she wants those dream box successes to then have a competition."	No DreamBox Math Traning Self-Led for DreamBox Math No Central Office Observations Not passionate is DreamBox Math- but kids like it	" Now I know that you had asked about the training, I haven't had DreamBox Math or Lexia Core5 Reading training." "For DreamBox Math I genuinely add generally let the students get onto dream box because dream box is a progress monitoring system. So it goes from you know, the kids that don't know anything from second grade level to those kids. I mean, I have a kid in my class who's on a fifth grade DreamBox Math level."
Lexia Core5 Reading	- No Specific Lexia Core5 Reading Train - Lexia Core5 Reading Training- Teache - Week Training (During the Literacy Bl - Teacher Expectations- Finish Line bef	"So my new teacher week was during t "Actually, it was just part of the literac "My feel like it's kind of loosen Lexia C	No Lexia Core5 Reading Training Use For Small Group/ No Dedicated Ti No Central Office Observations Not good for whole group Lexia Core5 Reading is boring to upper Does not think Lexia Core5 Reading is	" Now I know that you had asked abou "So as a whole, I do don't think Lexia C "that Lexia Core5 Reading is boring to
Professional Development Defined as "structured professional learning that results in changes to teacher knowledge and practices, and improvements in student learning outcomes." (Darling-Hammond, 2017)	- Weeklong Training for New Teachers - Letters Training - Esau Training -Weeklong		Specialist are PD Teammate (Support) Andrea Swank (ITRI Specialist)	"Yes, I will say Andrea Swank. There we
School Supports Includes interactions that include principal teacher interactions, including principals influence on sensemaking, and instructional practice. It also include structures such a PLCS and coaching.	- PLC - Reading Specialist (Reminds/ Accoun - Math Specialist	"And then in our PLC, sometimes they' " And then also at my school the readi " But here the math specialist says let'	Reading Specialist Math Specialist Planning Meetings Assistant Principal - Feedback Colleagues- Other Teachers	"So I have I have feedback from both A

	Rockhill ES Instructional Specialists			
Bins/ Concepts	**Theme (math)**	**Key Quotes**	**Theme (ELA)**	**Key Quotes**
DreamBox Math	No vendor PD in the 21-22 school year.	DreamBox Math PD is not mandatory at the school, so many teachers have opted out.		
Lexia Core5 Reading			No clear expectation around Lexia Core5 Reading time in the classroom, but it was a Tier 2 intervention in the 21-22 school year. This is not the case in 2022-23 school year.	"Lexia Core5 Reading is based on units, but we used the approximate time, but it was a little confusing, so we don't do that this year."
Professional Development **Defined as "structured professional learning that results in changes to teacher knowledge and practices, and improvements in student learning outcomes." (Darling-Hammond, 2017)**	Coaches are provided training by Central Services staff first and then roll it out to teachers.	"The one thing I like about DreamBox Math PD is that they have self-paced modules."	Provides pacing guides for each grade level. Meets with the Lexia Core5 Reading vendor monthly and reviews reports with vendor and is able to ask questions.	"We are told first about literacy laws and then we meet with grade levels to talk about it."
School Supports **Includes interactions that include principal teacher interactions, including principals influence on sensemaking, and instructional practice. It also include structures such a PLCS and coaching.**	Students are on technology too much. Coached some teachers who were having difficulty.	"I conducted a coaching cycle with a teacher where we put number sense assignments in for students to encourage mastery of learning."	Students are on technology too much. Meets with grade levels, the coach would touch base with teachers about Lexia Core5 Reading implementation, but nothing formal.	"Lexia Core5 Reading and DreamBox Math should be more secure, so students don't have to open other browsers."

	Widewater ES Instructional Specialists			
Bins/ Concepts	**Theme (math)**	**Key Quotes**	**Theme (ELA)**	**Key Quotes**
DreamBox Math	Received Train the Trainer PD from DreamBox Math six years ago. 5 lessons per week was the expectations for all students.	"DreamBox Math is a good program, but it's not a program you can just put student son for 20 minutes...the teacher has to interact with students."		
Lexia Core5 Reading			Regularly meets with the Lexia Core5 Reading Rep.	"New teachers can be overwhelmed by the program."
Professional Development **Defined as "structured professional learning that results in changes to teacher knowledge and practices, and improvements in student learning outcomes." (Darling-Hammond, 2017)**	Receives PD from the division and then conveys that information to the teachers in PLCs and PD days provided by the division. Challenging to provide PD when there is so much turnover.		Teachers participated in LETRS PD in 21-22 school year. Optional PD in 21-22 with Lexia Core5 Reading being an option.	"It's been a gradual release with teachers to get them to understand the program."
School Supports **Includes interactions that include principal teacher interactions, including principals influence on sensemaking, and instructional practice. It also include structures such a PLCS and coaching.**	Supports teachers weekly in PLCs. rewards were provided for classes and grade levels that met their goals.		Receives support from the division and provides support to individual teachers and PLCs.	"I don't feel like I'm an expert in Lexia Core5 Reading, but I feel pretty confident in it."

	Moncure ES Instructional Specialists			
Bins/ Concepts	Theme (math)	Key Quotes	Theme (ELA)	Key Quotes
DreamBox Math	- Supplemental Tool - DreamBox Math Implementation Team - Have to reset DreamBox Math constantly - No guidance from the central office - No personal relationship with the vendor. - Not utilized much in 2022-2023 school year.	" And you know, a lot of things that DreamBox Math has, but I think it's important for us to have that digital aspect- that's where kids are now and days, you know, we have to have some kind of digital function for them. Yep. But also it's important because that is just a avenue of learning that a different way of learning for our kids. I do believe it's an has a place and it's important, okay, in instruction." "Usually we just use what DreamBox Math suggested -- 20 minutes here, there." "And then we had and then we also had a dream box implementation team, which was kind of cool. We kind of got together and you know, what are some things to [focus on] and it was about it was about one person from each grade level participating." " I have to call the company to reset." "No, no one has ever had Yeah, yeah." "Did not get the buy in this year [about the reset] I wanted to did not ask for a reset for kids to keep working on the platform."		
Lexia Core5 Reading			2021-2022- Focus for teachers to target kids on their units over their time. (Goals) Individual Goals for buy in per-teacher (no school goal) Central Office Provided Recommendations around usage (During pandemic) 2022-2023- Was able to focus on Kindergarten on learning on how to log-in (so teachers could focus on small groups Tier 2 and Tier 3) 2022-2023 -No expectations on the usage of Lexia Core5 Reading this year since kiddos don't have devices at home.	"But yeah, that big takeaway was make sure that they're completing units that they're not just letting the time click by and that they're paying attention to all of the messages we've shared, it was really watched those units, check for the lessons as they pop up, to be able to provide that intervention." "Yeah, so it really kind of depends on the teacher. Most teachers have a system within their classroom. We don't really do anything at the school level. They will print them off, some of them will display them up on their smartboard have the whole class you know, clap and celebrate kids. So teachers will have literally A Lexia Core5 Reading binder and kids are working through and working on those goals and they're monitoring progress and talking to parents. But we have like I said, a wide range of experience amongst staff as well." "And yes, we were kind of recommended, you know, that kiddos get on a certain number of minutes that teachers watch those. Those units. Checking for certificates, kind of a similar things that we had mentioned. The rapid shared."
	- Types of activities - Webinars- 15 min webinars for DreamBox Math - Implementation and Expectations - County-Wide Professional Development (2019-2020)- Half A Day	"Anything curricular." " If they have, you know, if it does have this feature, can we turn it off? Can we how can we use this to make sure that it's is is not just really just the use of it, it's more of the practical,	Reading Specialist brings back information from meetings. In the past Lexia Core5 Reading Rep Speak about Lexia Core5 Reading (Reps present to staff) Case by Case - Individual Coaching	" So at least from our school lens, I bring back information from my reading specialist meetings about best practices we try to follow a structured literacy approach. So in our kind of team meetings, our PLC meetings over

Professional Development Defined as "structured professional learning that results in changes to teacher knowledge and practices, and improvements in student learning outcomes." (Darling-Hammond, 2017)	For DreamBox Math/ Half for ORGO - Specialist planned a DreamBox Math training in house- pre-pandemic	how can we use it in our classroom kind of thing, because most teachers can sit down and figure out how to do it, right? How can we put this in our classroom if we are already busy?" "We had our first year at DreamBox Math was a full year that we had. And we had a really cool implementation for that. We had they had webinars which were kind of a little dry. But they were kind of good in a way because they were good 15 minute, but as long as I was with them, we kind of beefed it up with a little bit more of, you know, practical reasons how we're going to use it at Moncure." "and then the next year we did have we did have a county wide there was a couple countywide, where we were able to take a teacher to from each grade level for and and I went with them." "They gave me some ideas on how to motivate kids to do DreamBox Math bulletin boards. You know, contest ideas. Yeah, some ways to record it, so that you could keep track and then they at that time, it was new that the teachers could actually assign lessons."	Lexia Core5 Reading PD- Webinars that were Learning system (during the pandemic years) and with Rep SIOP	the last few years, we've shared all of that knowledge that we get and kind of talk about the best way to set up their classrooms in terms of tier one, how much time to spend in kind of each area of literacy." "n the past, we've had a little bit more time for things like professional development around Lexia Core5 Reading . We have had a rep in the past come and speak about the tools and the different resources. We haven't had time yet this year. So I would try to kind of present within meetings, you know what that expectation is? Through, you know, just a short presentation after we've gotten our fall data and we've said okay, here, here are the kids that are struggling here are some different kind of menu options of what would be an appropriate tool for those kiddos." "watched a couple of the webinars. I think they've since taken them down."
School Supports Includes interactions that include principal teacher interactions, including principals influence on sensemaking, and instructional practice. It also include structures such a PLCS and coaching.	- Specialist Support - Mentors - Central Office Support for DreamBox Math during the Pandemic (Not a lot of Central Office Support) - Math Lunch and Learn (During Covid)	"It is my job to support with anything more than the basics [with DreamBox Math]." "Created tracking purposes for RTI for DreamBox Math- simply things that they could keep track." "Mentors support to ensure teachers know things that should already be in place." "Well, we talked about well, all during the pandemic, we had school wide contests where the kids would get certificates and that was done by the central office person, okay." " It's surprising to me because I really don't check it that off. You know, I I just assume that, you know, we use it and I offer it as a suggestion when things you know, for RtI purposes and if things come up, and so that was a good thing that our kids were actually involved." "Kimberly Hayden [Central Office Staff- Elementary Math Coordinator] provided support regarding DreamBox Math when asked"	PLCs Meetings Reading Specialist- Shares tools and resources Work with Small Groups of Teachers (Not a big schoolwide PD, Case by Case) Principal Create- Challenges and Raffles during Pandemic Years to encourage Lexia Core5 Reading usage Implemented a Teaching Learning Group (2020-2021)	"When I come across a resource where there's something that I feel like our kids need. I have a pretty open relationship with my administration. And so I will kind of go out and go alright, I really think this is what we'll need. I talked to our facilitator, reading facilitator for the county level, usually at her support, and she will often either buy it for us or buy it for other schools in the county. And so, in terms of PD, it's still very grassroots, very organic."

	Falmouth ES Instructional Specialists			
Bins/ Concepts	Theme (math)	Key Quotes	Theme (ELA)	Key Quotes
DreamBox Math	Students need to attempt 5 lessons; goal is 5 lessons per week	"Monthly usage reports" "It's an excellent resource. I would like to have teacher use it more deeply. But I understand why they don't have time for that"		
Lexia Core5 Reading			Had Lexia Core5 Reading for years as an intervention, 10-15 licenses per school; during COVID was purchased for the whole county	
Professional Development Defined as "structured professional learning that results in changes to teacher knowledge and practices, and improvements in student learning outcomes." (Darling-Hammond, 2017)	Specialist meets with teachers every three weeks, looking at curriculum guides and then specific to DreamBox Math; don't really work with the vendor	"We try to give them time to dig in and look at the lessons and look at where children are stuck. I'm having a hard time teachers getting in it as much as I'd like but I understand how overwhelmed they are" "I try to guide my math meetings in a professional learning community atmosphere of what are the kids' needs, how do we know they've learned it and what do we do it they know it or don't know?"	PLCs and Lexia Core5 Reading vendor; work with vendor 3x per year	"I really want teachers to understand the why of what we do. And we're asking teachers to change a lot of the way that they teach and it's hard to change something that you've been doing a long time. So my goal is that a teacher would understand why we are making a shift."
School Supports Includes interactions that include principal teacher interactions, including principals influence on sensemaking, and instructional practice. It also include structures such a PLCS and coaching.	Specialist meets with students who are struggling		Reading specialist chooses the priorities for PD/PLCs; reading specialist is monitoring the usage by student and grade	

	Parkridge ES Instructional Specialists &TRT			
Bins/ Concepts	**Theme (math)**	**Key Quotes**	**Theme (ELA)**	**Key Quotes**
DreamBox Math	Pre-Pandemic: DreamBox Math training years ago (All the county) Math Specialist at the time (Susan McGrady)- Early 2010s. 20-21 Year- No Follow up from the district 21-22 School Year- Choose not to send devices home (No fidelity at home with DreamBox Math) Concern about fidelity of implementation	"DreamBox Math was was purchased and rolled out for the entire county, all of the children. " "No, not not, not as a district. I mean, I don't know if he could have with everybody be virtual. I mean, I guess they could have if they had to, in smaller bunches, but I don't believe" "You can't implement it with fidelity when you're just throwing it out there to everybody. And I get why they did it during the pandemic."		
Lexia Core5 Reading	Pre-Pandemic: Training given only the Reading Specialist Lexia Core5 Reading was communicated through the Reading Specialist Reading Specialist Meets with Lexia Core5 Reading Recp 21-22 School Year- Choose not to send devices home (No fidelity at home with Lexia Core5 Reading) Tier 1 Kids don't need Lexia Core5 Reading	"Lexia Core5 Reading was the program that was purchased that was basically at first only being used for those who were tier two tier three, and the reading specialists handled and dealt with all of that and they received the training." "she did she meets with somebody from Lexia Core5 Reading she did last year as well as this year. I sit in on some of those meetings whenever I can. But a lot of times she's like type of person who would rather have two people have the information." "while we're looking at your tier one and above, kids really don't have to do Lexia Core5 Reading if they don't need to, can they get on and do it"	Not many Licenses at First COVID Expectations 2020-2021 (Yes) 2022-2023 Goals (No district expectations) Biggest Concern is Fidelity of Implementation- Don't want kids to do Lexia Core5 Reading at home	"we started using Lexia Core5 Reading at a previous school I was at in the county and at that time, Lexia Core5 Reading licenses for only so many per school. And so they were utilized in the reading department. Actually, they were utilized by the PS TT Premier Support teacher. And we didn't really we being the reading department didn't really have the licenses under our management. In this building at Park Ridge licenses were under the management of their reading department." "but during COVID Every child 15 minutes a day on Lexia Core5 Reading every child didn't need 15 minutes a day on Lexia Core5 Reading ." "We did during COVID times there were documents that went out then were shared with all the teachers, you know how much usage you know, we wanted them to do during you know this COVID times and then this year, as far as very specific. I don't I don't believe so." "My biggest, my biggest angst with Lexia Core5 Reading as far as fidelity of implementation is to you know, I've told them repeatedly, I've auto reset and I know you don't like it, but our teachers our work, you know, we don't want to work with a mess. Just like you don't I know you're using all this usage for your data metrics. And I get that, but if we know what we're getting is interference from other people from siblings, from adults. Why is there not a way that Lexia Core5 Reading can't allow us to lock them out? At the end of the school day,"
	RTI-PD Canvas Learning Para Training Led by ELA Specialist		Ongoing Support For Teachers Reading Specialist PD with Lexia Core5 Reading Rep	Okay, so as far as teachers go, it has been an ongoing, professional learning process with our teachers with very targeted areas to address making sure we understand the website, making sure we understand what we're looking

Professional Development **Defined as "structured professional learning that results in changes to teacher knowledge and practices, and improvements in student learning outcomes." (Darling-Hammond, 2017)**				at student usage." "I meet with a lady once a month, the actual the Lexia Core5 Reading Yeah, we have a liaison. Last year it was Abby Benson this year. I've only met with her once. It's a new lady, but I'll be meeting with her again. And we have a professional development day coming up in November. And I have November 7. I coordinated with my liaison so that she has someone that will be doing a virtual professional development, two sessions that day. One tailored for our K three and the other tailored for our four- five "
School Supports **Includes interactions that include principal teacher interactions, including principals influence on sensemaking, and instructional practice. It also include structures such a PLCS and coaching.**	PLCs (Attend PLC meetings) Pacing Guide Curriculum Guides and User Guides Modeling for Newer Teachers (see below) Andrea-RTIT Katy- ELA Specialist Sandy- Ashley- AP	"hey want them geared toward using the curriculum guides and the pacing guides that they're pushing down." "What we're trying to do for some of these younger teachers is to model where they should be going for activities. Activities that we'll put like in math that will provide a hands-on approach all the way through to the abstract. So from the concrete to the abstract and how that progression looks and why that is important. For kids to learn that. Yep. So a lot of what I do is, and we do we meet, and I asked her a lot of questions because a lot of it is about writing objectives. You know, what, what is that going to look like if this is what it says that they're going to do? "	Resources PLC- Small Agenda	"we also have spent a lot of time in the Resources. Whether we were using digital learning and how we could use the slide decks and all of that, copying things so we could share them with students and watch them work the papers. Our special ed department was thrilled because they could really use that in the digital learning platform. Because and they could tailor it to their students' needs. Then, you know now when we have identified our children, how we're using all these resources, you know, it's literally a resource of like Wonderland. It is a resource Wonderland as far as tier one, and tier two and tier three. "And that only comes with going in going in going in and so one couple the grade levels today that I know usage might not be it's not as high that is on their small agenda when I spend time with them today is to get into Lexia Core5 Reading. Again, pull up our dashboards and make sure we look at the students who are identified in that tier two. Especially if they had targeted intervention on their plan that went home to parents because if they chose targeted intervention, we can use Lexia Core5 Reading. And we have the opportunity also to use our other resources that correlate with our curriculum. "And that only comes with going in going in going in and so one couple the grade levels today that I know usage might not be it's not as high that is on their small agenda when I spend time with them today is to get into Lexia Core5 Reading. Again, pull up our dashboards and make sure we look at the students who are identified in that tier two. Especially if they had targeted intervention on their plan that went home to parents because if they chose targeted intervention, we can use Lexia Core5 Reading. And we have the opportunity also to use our other resources that correlate with our curriculum. "

	Administrative Matrix-Rockhill ES (AP & Principal interviewed together)			
Bins/ Concepts	Overarching Concepts			
	Theme Principal	Key Quotes	Theme AP (School Admin)	Key Quotes
DreamBox Math	School-based decision whether or not to use DreamBox Math.	"The teachers were asked to spend ridiculous amount of hours on asynchronous DreamBox Math PD...I said, "no way"...now [1st quarter] they are supposed to complete it.	School-based admin were not a part of DreamBox Math PD. This went directly through math coaches.	
Lexia Core5 Reading	School-based decision whether or not to use Lexia Core5 Reading.		PD provided with the Lexia Core5 Reading vendor. Admin and coaches met with the Lexia Core5 Reading vendor rep. monthly to troubleshoot and ask questions.	
Professional Development Defined as "structured professional learning that results in changes to teacher knowledge and practices, and improvements in student learning outcomes." (Darling-Hammond, 2017)	C & I information is funneled through the coaches	"Professional development is based on teacher needs."	Focus on digital citizenship	
School Supports Includes interactions that include principal teacher interactions, including principals influence on sensemaking, and instructional practice. It also include structures such a PLCS and coaching.	PLCs have extended planning block once a week for PD and other support. No specific expectations from the division.	"Our direction was taken more from the Lexia Core5 Reading vendor."		"We would get STAR data, MAP data, and SOL data...that was really all the data we looked at."

	Administrative Matrix-Falmouth ES Principal			
Bins/ Concepts	Overarching Concepts			
	Theme Principal	Key Quotes	Theme AP (School Admin)	Key Quotes
DreamBox Math	Monitor usage for overuse or underuse; paras monitoring use and pulling lessons	"Standards given by the district like a parameter to stay within. This is the best practice, and this was shared with our teachers and monitored. During COVID, there were times it was overused."		
Lexia Core5 Reading	monitor usage for overuse or underuse; more involvement with Lexia Core5 Reading rep	"Standards given by the district like a parameter to stay within. This is the best practice, and this was shared with our teachers and monitored. During COVID, there were times it was overused."		
Professional Development Defined as "structured professional learning that results in changes to teacher knowledge and practices, and improvements in student learning outcomes." (Darling-Hammond, 2017)	grade level PLCs once a week for 90 minutes; two weeks of reading, one week of math; specialists also join common planning			
School Supports Includes interactions that include principal teacher interactions, including principals influence on sensemaking, and instructional practice. It also include structures such a PLCS and coaching.	reading and math specialist, faculty facts sent weekly with expectation and resources; ITRT; instructional meetings; district math support	"The coaches and I really dialogue quit a bit. What they hear in reading and math meetings, they bring back, what I hear in principal meetings, and we talk about it together. We discuss what will be shared in PLCs, instructional meetings or faculty facts so everyone is speaking the same language"		

	Administrative Matrix-Widewater ES Principal			
Bins/ Concepts	**Overarching Concepts**			
	Theme Principal	**Key Quotes**	**Theme AP (School Admin)**	**Key Quotes**
DreamBox Math	Haven't spent a lot of time on DreamBox Math. Not user friendly for reports and no vendor support.	"DreamBox Math does not have school level view, only a teacher level view."		
Lexia Core5 Reading	Meets with the vendor regularly or review reports and ask questions.	"Vendor PD was available to all schools, but you have to be willing to be vulnerable to say, we got a lot of kids that don't know how to read in out school...and sign up."		
Professional Development **Defined as "structured professional learning that results in changes to teacher knowledge and practices, and improvements in student learning outcomes." (Darling-Hammond, 2017)**	Embed PDF in PLC meetings on complex text, standard alignment, and resources. Conducted data digs with support from the division.	"The follow up on the PD is what makes the program worth the money because what other programs do we have where somebody else comes and provides the data highlights."		
School Supports **Includes interactions that include principal teacher interactions, including principals influence on sensemaking, and instructional practice. It also include structures such a PLCS and coaching.**	Support is provided through faculty meetings, PLC meetings, and self-selected PD. Provides coaching			

	Administrative Matrix-Parkridge ES Principal			
Bins/ Concepts	**Overarching Concepts**			
	Theme Principal	**Key Quotes**	**Theme AP (School Admin)**	**Key Quotes**
DreamBox Math	- Enhance Instruction - No training for DreamBox Math (only training from Math Specialist) - No district expectations for DreamBox Math - School expectations given by Math Specialist and Principal (DreamBox Math Champion)- Pandemic- at least four days a week - Also Math facilitator for the district (Math Specialist point of contact) 21-22 and 22-23 (not so much)	"Um, I feel like digital instructional tools should enhance the instruction not be the instruction" "only training I've gotten on DreamBox Math comes from my math special." "Like that was an expectation that, you know, at minimum four days a week that they would do an electrical dream back lesson."		
Lexia Core5 Reading	- Enhance Instruction - Received Lexia Core5 Reading Training- Lexia Core5 Reading Rep cam last year and this year (Webinar) - Literacy Block (Tiered Time, Must Do, Can Do- based on tiered) - No specific expectations from District - Only School specific expectations	"Um, I feel like digital instructional tools should enhance the instruction not be the instruction" "I did for Lexia Core5 Reading not DreamBox Math." "Lexia Core5 Reading . It depends. Sometimes Lexia Core5 Reading or dream box is a can do, but letting a dream boxes they can do for those higher level kids. For those lower level kids. It's a must do so it really depends on the student." "Yes. For that context, yes. reading specialists is here expectations were given."		
Professional Development **Defined as "structured professional learning that results in changes to teacher knowledge and practices, and improvements in student learning outcomes." (Darling-Hammond, 2017)**	PLCs (Reading and Math info during PLCs) PD Days- Determined using scores Planning Time (45 mins)- One of those time need to meet with the Reading Specialist - Once a month Training- Lead Person goes to campus (teach the teacher)	"What are you doing with the data? That's what's important? How is the data from these programs, driving your instruction? That needs to be the ultimate question that teachers need to be asking themselves, and that's the conversation that should be happening at PLC." "the goal is that kids would move through the tears with with, of course, the goal being that 100 children will be in tier one. And although that's a situation where that doesn't always happen, of course, that's our ultimate goal. So what we're always trying to do is move kids through the tiers, so definitely trying to move to tier three kids enter at minimum tier two, but definitely trying to move everybody into tier one. " "But now what we've instituted is one of those planning times has to be met with the reading specialist, where she is doing some professional development, speaking to some strategies and skills, given the resources."		
School Supports **Includes interactions that include principal teacher interactions, including principals influence on sensemaking, and instructional practice. It also include structures such a PLCS and coaching.**	Leadership Team PLCs- Principal Attends each PLCs PD Days (Two This Year) Walk-Throughs Reading Specialist Math Specialist AP	"Now my leadership team consists of myself, my assistant principal, my real specialists, my math specialists, and my instructional technology resource teacher" "That expectation comes from the leadership team, and we follow up on that fidelity during our PLC conversation." "Well, every we have PLC every day, but grade levels are once every six day so kindergarten is a fifth. And then first grade is day one following the fourth." "However, we do have a central office math person, and she has come to our building twice already this year, and we did walk into the classroom." "My math specialist provided my paraprofessionals with training in specific areas. So when you go into a class during the tiered block that 30 minutes of quality, sacred time, there's always a paraprofessional in the room. So with the teacher working with the lowest group because we all know the neediest kids needed teacher, but it's the paraprofessional worker with that next group. And those paraprofessionals have been trained specifically to support students in deaf hearing. "		

	Administrative Matrix-Moncure ES Principal			
Bins/ Concepts	Overarching Concepts			
	Theme Principal	Key Quotes	Theme AP (School Admin)	Key Quotes
DreamBox Math	Used as a Tier 2 Support DreamBox Math (school-instructional leadership team expectations)- minutes and lessons (better focus on lessons rather than minutes)- No district expectations Fifth Grade Never bought into DreamBox Math Tier 2 and Tier 3 Times are used for DreamBox Math [Flaw] Platform not seamless for students- allows them so skip unfinished lessons	"And so once we made it through that year, we really have changed much more to like say DreamBox Math is more of a support to tier two kiddos and it can be the extra practice for more of our tier one or tier three can be used, but frankly, sometimes the gaps are too large and we're trying to help them out in different areas." "Me and my instructional leadership team? Excellent. Yeah, this was us just doing our own piece. So and we did it for both so and everything was in one sheet." "My fifth graders probably never really bought into Dropbox the same way as my older grade levels. They just felt that it needed to be challenged a little bit more. And so that's, that's just kind of where we are but again, when we when you look into our usage overall." "I don't like the dream box when a kid hits frustration and allows them to give up on that lesson and go to another one. And so I hate but again where I kind of turn a little sour was whenever it was just hey, it's alright I can You can be a kiddo and you're showing all these minutes and you have all these unfinished lessons." "And to me that's a flaw and how that program was developed. Because you should never be able to move on to another one until you actually finish."		
Lexia Core5 Reading	Tier 2 Support Lexia Core5 Reading takes more time - Not doing a good job (Need to dig into the data) Lexia Core5 Reading (school-instructional leadership team expectations)-- X number of minutes in a Week (Are you meeting your targets?) Mini Lessons are key, but we were not able to implement them 20-21 SY since the kids were home and virtual Tier 2 and Tier 3 Times are used for Lexia Core5 Reading	"Hey, as one of our tier two interventions we can do, right? I can do Lexia Core5 Reading we can do DreamBox Math.," "Because Lexia Core5 Reading is not just about having the students to their piece. We use the right way. You need to be able to dig into the data and pull out the other lessons and have time to be able to hit those. We're not doing a very good job with that. So we're not it's because we're trying to hit in our INTO Reading. We're trying to get our phonics in open court. Like we're just like we're given the kids to practice and kind of praying. I hate to say it that way. Because there's just so many resources are just we're dividing ourselves too thin a little bit. Yeah. So I believe we we definitely couldn't be better okay even with it. But I it's been a struggle, if that makes sense. "		
Professional Development Defined as "structured professional learning that results in changes to teacher knowledge and practices, and improvements in student learning outcomes." (Darling-Hammond, 2017)	- Lexia Core5 Reading training in 2019 from District (Attended a follow up meeting last year with the consultant) - DreamBox Math from District (years ago training- nothing recent) - School Training for Lexia Core5 Reading and DreamBox Math but very surface level -SIOP Training (11 session course) -Orgo Training (Math) - ESAU	"And they every week we have an hour and a half long meeting that we're able to talk about, you know, we're looking at from planning to CFA's, to digging into how we can support the kids, to how can we we identify kids to get what we call or what I need; which is separate from tier two and tier three time for supporting that. And all these tools are are at our availability, but that we haven't drilled in say you might only use this one here. Here's this one there. It is one of the ones that are available." "given some early training as a school 21 Yeah, just trying to say, look, "This is what we're looking for. Here's how you read the report." This is but we still even during that time, it was hard, like we knew best practice for Lexia Core5 Reading would have been to be able to get those other mini lessons, but it was so hard to get kids to log in for virtual small groups." That you couldn't give them any lessons anyway. Yes. We had more time we had the data to dig to do it. But we weren't able to get the kids to be reliable."		
	County Level Focus on sharing curriculum- but there is so much, not alot of time to fit everything in.	"between our classroom teachers and our reading specialists [in terms of pulling reports for Lexia Core5 Reading]." "So we're looking at our ones and our twos for the current		

School Supports **Includes interactions that include principal teacher interactions, including principals influence on sensemaking, and instructional practice. It also include structures such a PLCS and coaching.**	Paraprofessionals- support during win support (5 reading paras, 4 math paras- allocated with title funds) Master Schedule with recommendations for pull out time (Tiered Interventions) E-PLC (1 hr and half whole group planning time) WIN Support Time (30 mins time is current)- Most skilled person teaching- shifting teachers to support the most high need students Tier II & Tier III Structure Time Instructional Leadership Team (2 Aps, Principal, Two Reading Specialist (One title funds paid role), Math Specialist, Intervention Specialist (several years role) Pulling Reports for Lexia Core5 Reading - Classroom Teachers and Reading Specialist SIOP Coach- focus on creating lessons based on the SIOP trainings (Title one funds paid role) 22-23 SY	content. Okay, right. And that's a win (what I need) so we're extending the other kids who are threes and fours. We're focusing on filling in gaps that are there. When is current? You didn't show you understood what we just taught. Now we're gonna give you 30 more minutes in small groups to help and support that." " want teachers who are the strongest the teachers, my teacher who blew the first round of the tests out of the water and their kids do well. I want them to teach the lowest kids." "Intervention Specialist- in the EPLC meetings, so when we are going through the CFA data, now she's saying, "All right, so where's the ones and twos." Now she's looking at them, "I need a name with your number," putting them on another spreadsheet, basically, and saying, all right, this is the kid if we're only in primary grades or more of all right, can you pull them into like three groups." She's like, I'm making the plans up. We're going to have these three groups. I'm pulling these kids and pulling these kids I know where they are. and then like she's teaching the Paras how to in planning forms. So this is how we're doing or when the support the current score. So that's kind of like her niche is where she is." "SIOP coach, her big piece, is to make sure that we're focusing on creating the lessons that mirror what we should be doing based on our SIOP trainings that just took place. So she's working with teams, as they're developing solid lesson plans. She's going in and she's co teaching "Hey, who needs help as we're doing these as we're, we're focusing on content objectives and language objectives and there's a different content -- you're SOLs or national or state standards that the state gives us." The language is basically putting the work saying we will learn these by and so it's, it's given the action it's not just saying you will, this is what you're going to learn and it changes the whole spin on how , but she's helping them out to look into how are we thinking about each of these parts of the lesson."		

	Central Office Role: Literacy (SS)			
Bins/ Concepts	Overarching Concepts			
	Theme(s)	Key Quotes	Theme(s)	Key Quotes
DreamBox Math	[redacted]			
Lexia Core5 Reading	Have had Lexia as long as Sarah has been in the division; every school had a set number of licenses this changed and expanded over the pandemic		Assessing what works with minutes of usage vs measurable student growth	"How do we shift away from just checking off minutes? ... A big part of Lexia is not just the online portion, but the face to face lessons. Face to face was more difficult during virtual so last year we really worked through how do we set up school wide structures that ensure that those face to face lessons are being administered and tracking student and growth and making adjustments"
Professional Development Defined as "structured professional learning that results in changes to teacher knowledge and practices, and improvements in student learning outcomes." (Darling-Hammond, 2017)	Curriculum and Instruction looks at aligning research based best practices and evidenced based best practices; provide recommendations to equip schools and teachers	Expectations come from a department other than curriculum and instruction; PL that 's needed for teachers to be successful in having the skills they need	Division training is is more generic and schools can customize; plan training for the division with a success manager to ensure alignment with division goals	
School Supports Includes interactions that include principal teacher interactions, including principals influence on sensemaking, and instructional practice. It also include structures such a PLCS and coaching.	Vendor and division training targeting reading specialists and ITRT to then provide targeted training at the school level	reading specialists have shifted from being interventionists to an instructional coaching role; all schools have at least one reading specialist, title one schools often have two reading specialists as coaches the role is really help to coach teachers to effectively meet the needs of students and oversee intervention. But they aren't the ones doing intervention	Accountability comes from the CAO	

	Central Office Role: Math (KH			
Bins/ Concepts	Overarching Concepts			
	Themes	Key Quotes	Themes	Key Quotes
DreamBox Math	Always have seen digital instructional tools as tools	"Something that can support student learning at a variety of levels, can position students as authors of their learning that does more than just practice context but helps them to build and grow."	tracking completion of lessons; some expectation given	"I mean maybe the principal established the expectation of what they want to see. I do know some of them have made a clearer expectation than others."
Lexia Core5 Reading				
Professional Development Defined as "structured professional learning that results in changes to teacher knowledge and practices, and improvements in student learning outcomes." (Darling-Hammond, 2017)	Curriculum and Instruction does not set policies or expectations, but they do provide training on resources	curricular documents that include pedagogical moves	brought in the vendor to provide PD; some asynchronous options offered	
School Supports Includes interactions that include principal teacher interactions, including principals influence on sensemaking, and instructional practice. It also include structures such a PLCS and coaching.	building level, job-embedded PD	PLCS and grade level conversations with a push towards more coaching and individual coaching cycles	needs targeted at building level; reboots on use were determined at school level	math specialist and ITRT are the ones that teachers go to for the most support on integration of digital tools

	Central Office Role: Executive Directors			
	Overarching Concepts			
Bins/ Concepts	Theme(s)	Key Quotes	Themes	Key Quotes
DreamBox Math	Tool, resource but not a primary instructional tool		Use as a resource but there wasn't a directive; follow up with schools varied	
Lexia Core5 Reading	Tool, resource but not a primary instructional tool		No central office expectations around the use of Lexia vs expectations during the pandemic; building level decisions all along adhering to guidelines but nothing definitive	Guidelines communicated through the coordinators to the reading [and math] specialists and shared with building principals
Professional Development **Defined as "structured professional learning that results in changes to teacher knowledge and practices, and improvements in student learning outcomes." (Darling-Hammond, 2017)**	School based decisions around PD; there aren't a ton of PD days built into the calendar;	"School improvement plans are focused on reading and math and principals may use digital tools to help with differentiation. Site based decision"		
School Supports **Includes interactions that include principal teacher interactions, including principals influence on sensemaking, and instructional practice. It also include structures such a PLCS and coaching.**	Changes in division support from the use of Lexia and Dreambox at the start of the pandemic	"Many different initiatives and priorities with changes in superintendents and the change in student demographics"	In some schools ITRTs play a pivotal role, but in some schools administrators may have directed more of the integration of Lexia and Dreambox	

Appendix C

Master Schedule: Moncure ES

Anne E. Moncure Elementary School
Master Schedule
2022 / 2023

MASTER SCHEDULE

Morning Announcements 7:55-8:00 · Announcements / Dismissal @ 3:00

Kindergarten (M, W, TH, F)	Morning Meeting	Language Arts 65 min	Specials 45 Min	LA 15 min	Kg Tier II and III Reading	LA 30 min + WIN Support	Math 15 Min	Lunch 35 Min	KG Tier II and III Math + WIN Support	Math 50 Min	Recess 30 Min (20 Min PE Days)	Science / SS 30 min
Kindergarten (TUESDAY)	BEAR "Be Excited About Reading" 35 Min	Specials 45 Min	LA 60 min	Kg Tier II and III Reading	LA 30 min + WIN Support	Math 15 Min	Lunch 35 Min	Math	KG Tier II and III Math + WIN Support	Math 40 Min	Recess 30 Min (20 Min PE Days)	Science / SS 30 min
GRADE 1 (M,T, W, F)	Morning Meeting	LA 30 min	1st Grade Tier II and III Reading	LA 30 min	LA 30 min + WIN Support	Specials 45 Min	Lunch 35 Min	Science / SS 45 min	Recess 30 Min (20 Min PE Days)	1st Grade Tier II and III Math + WIN Support	Math 60 Min	
GRADE 1 (THURSDAY)	BEAR "Be Excited About Reading" 35 Min	Specials 45 Min	LA 25 min	LA 30 min + WIN Support	LA 45 min	Lunch 35 Min	LA 15 min	1st Grade Tier II and III Reading	Recess 30 Min (20 Min PE Days)	1st Grade Tier II and III Math + WIN Support	Math 60 Min	
GRADE 2 (MON / FRI)	2nd WIN Time 30 Min	Specials 45 Min	Language Arts 90 min	2nd Grade Tier II and III Reading	Recess 30 Min (20 Min PE Days)	Lunch 35 Min	Math 60 Min	2nd Grade Tier II and III Math	Science / SS 35 min			
GRADE 2 (WEDNESDAY)	BEAR "Be Excited About Reading" 35 Min	Specials 45 Min	Language Arts 90 min	2nd Grade Tier II and III Reading	Recess 30 Min (20 Min PE Days)	Lunch 35 Min	Math 60 Min	2nd Grade Tier II and III Math	Science / SS 35 min			
GRADE 2 (TUESDAY)	2nd WIN Time 30 Min	LA 50 min	Specials 45 Min	LA 45 min	2nd Grade Tier II and III Reading	Recess 30 Min (20 Min PE Days)	Lunch 35 Min	Math 60 Min	2nd Grade Tier II and III Math	Science / SS 35 min		
GRADE 2 (THURSDAY)	2nd WIN Time 30 Min	Language Arts 95 min	Specials 45 Min	2nd Grade Tier II and III Reading	Recess 30 Min (20 Min PE Days)	Lunch 35 Min	Math 60 Min	2nd Grade Tier II and III Math	Science / SS 35 min			
GRADE 3 (M, W, TH, F)	LA 85 min	3th Grade Tier II and III Reading	Recess 30 Min (20 Min PE Days)	Lunch 35 Min	3rd Grade Tier II and III Math	Specials 45 Min	Math 60 Min	3rd WIN Time 30 Min	Science / SS 45 min			
GRADE 3 (TUESDAY)	LA 85 min	3th Grade Tier II and III Reading	Recess 30 Min (20 Min PE Days)	Lunch 35 Min	Science / SS 45 min	3rd Grade Tier II and III Math	Math 60 Min	Specials 45 Min	BEAR "Be Excited About Reading" 30 Min			
GRADE 4 (MON / FRI)	Math 60 Min	4th Grade Tier II and III Math	Science / SS 45 min	Lunch 35 Min	Recess 30 Min (20 Min PE Days)	LA 85 min	4th Grade Tier II and III Reading	Specials 45 Min	4th WIN Time 30 Min			
GRADE 4 (WEDNESDAY)	Math 60 Min	4th Grade Tier II and III Math	Science / SS 45 min	Lunch 35 Min	Recess 30 Min (20 Min PE Days)	LA 85 min	4th Grade Tier II and III Reading	Specials 45 Min	BEAR "Be Excited About Reading" 30 Min			
GRADE 4 (TUESDAY)	Math 60 Min	4th Grade Tier II and III Math	Science / SS 45 min	Lunch 35 Min	Recess 30 Min (20 Min PE Days)	LA 15 min	Specials 45 Min	LA 70 min	4th Grade Tier II and III Reading	4th WIN Time 30 Min		
GRADE 4 (THURSDAY)	Math 60 Min	4th Grade Tier II and III Math	Science / SS 45 min	Lunch 35 Min	Recess 30 Min (20 Min PE Days)	LA 55 min	Specials 45 Min	LA 30 min	4th Grade Tier II and III Reading	4th WIN Time 30 Min		
GRADE 5 (M,T, W, F)	5th Grade Tier II and III Reading	LA 45 min	5th WIN Time 30 Min	Lunch 35 Min	LA 40 min	Science / SS 50 min	Recess 30 Min (20 Min PE Days)	Specials 45 Min	Math 55 Min	5th Grade Tier II and III Math		
GRADE 5 (THURSDAY)	5th Grade Tier II and III Reading	LA 75 min	Lunch 35 Min	5th Grade Tier II and III Math	Math 60 Min	Recess 30 Min (20 Min PE Days)	Science / SS 40 min	LA 15 min	Specials 45 Min	BEAR "Be Excited About Reading" 30 Min		
SPECIALISTS		Specials 45 Min	Specials 45 Min		Specials 45 Min	LUNCH	Specials 45 Min	Specials 45 Min		Specials 45 Min		
Reading Tiered Support (M, W, F)	5th Grade Tier II and III Reading	1st Grade Tier II and III Reading	3th Grade Tier II and III Reading	Kg Tier II and III Reading	2nd Grade Tier II and III Reading	4th Grade Tier II and III Reading						
Reading Tiered Support (T)	5th Grade Tier II and III Reading	1st Grade Tier II and III Reading	3th Grade Tier II and III Reading	Kg Tier II and III Reading	2nd Grade Tier II and III Reading	4th Grade Tier II and III Reading						
Reading Tiered Support (TH)	5th Grade Tier II and III Reading	3th Grade Tier II and III Reading	Kg Tier II and III Reading	2nd Grade Tier II and III Reading	1st Grade Tier II and III Reading	4th Grade Tier II and III Reading						
Math Tiered Support (M, W, F)	4th Grade Tier II and III Math	3rd Grade Tier II and III Math	KG Tier II and III Math	1st Grade Tier II and III Math	2nd Grade Tier II and III Math	5th Grade Tier II and III Math						
Math Tiered Support (T)	4th Grade Tier II and III Math	3rd Grade Tier II and III Math	KG Tier II and III Math	1st Grade Tier II and III Math	2nd Grade Tier II and III Math	5th Grade Tier II and III Math						
Math Tiered Support (TH)	4th Grade Tier II and III Math	5th Grade Tier II and III Math	3rd Grade Tier II and III Math	KG Tier II and III Math	1st Grade Tier II and III Math	2nd Grade Tier II and III Math						
WIN Support (M, W, F)	2nd WIN Time 30 Min	5th WIN Time 30 Min	1st LA Push-in WIN Support	Kg LA Push-in WIN Support	KG Math Push-in WIN Support	1st Math Push-in WIN Support	3rd WIN Time 30 Min	4th WIN Time 30 Min				
WIN Support (T)	2nd WIN Time 30 Min	5th WIN Time 30 Min	1st LA Push-in WIN Support	Kg LA Push-in WIN Support	KG Math Push-in WIN Support	1st Math Push-in WIN Support	4th WIN Time 30 Min					
WIN Support (TH)	2nd WIN Time 30 Min	1st LA Push-in WIN Support	Kg LA Push-in WIN Support	KG Math Push-in WIN Support	1st Math Push-in WIN Support	3rd WIN Time 30 Min	4th WIN Time 30 Min					

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Appendix D

Lexia Core5 Reading Student Tracker

3			Feb 22-28			Mar 1-7			Mar 8-14			Mar 22-28			Mar 29 - Apr 2			Apr 5-11		
Classroom Teacher	Grade	Overall Percent Met	Classroom Student Count	Met weekly target	Percent Met	Classroom Student Count	Met weekly target	Percent Met	Classroom Student Count	Met weekly target	Percent Met	Classroom Student Count	Met weekly target	Percent Met	Classroom Student Count	Met weekly target	Percent Met	Classroom Student Count	Met weekly target	Percent Met
A	KINDERGARTEN	71%	20	17	85%	20	15	75%	20	17	85%	20	16	80%	20	8	40%	20	12	60%
B	KINDERGARTEN	47%	17	7	41%	17	8	47%	17	8	47%	16	6	38%	17	10	59%	17	8	47%
C	KINDERGARTEN	48%	22	12	55%	22	10	45%	22	9	41%	22	11	50%	21	9	43%	21	11	52%
D	KINDERGARTEN	42%	20	6	30%	20	8	40%	21	9	43%	21	10	48%	21	11	52%	21	8	38%
E	KINDERGARTEN	87%	19	18	95%	19	18	95%	19	16	84%	19	17	89%	19	16	84%	19	14	74%
F	KINDERGARTEN	33%	20	5	25%	20	5	25%	20	9	45%	20	9	45%	20	7	35%	20	5	25%
G	FIRST GRADE	80%	18	17	94%	18	15	83%	18	15	83%	18	12	67%	18	15	83%	18	12	67%
H	FIRST GRADE	82%	17	13	76%	17	13	76%	17	16	94%	17	15	88%	17	15	88%	17	12	71%
I	FIRST GRADE	69%	16	10	63%	16	9	56%	16	9	56%	16	14	88%	15	13	87%	15	10	67%
J	FIRST GRADE	51%	17	6	35%	17	11	65%	17	9	53%	17	9	53%	17	10	59%	17	7	41%
K	FIRST GRADE	70%	19	12	63%	19	17	89%	19	14	74%	19	13	68%	19	14	74%	19	10	53%
L	FIRST GRADE	49%	19	9	47%	19	10	53%	19	11	58%	19	11	58%	19	9	47%	19	6	32%
M	FIRST GRADE	68%	20	12	60%	19	12	63%	19	14	74%	19	13	68%	19	14	74%	19	13	68%
N	SECOND GRADE	52%	22	11	50%	22	15	68%	22	10	45%	22	10	45%	22	12	55%	22	10	45%
O	SECOND GRADE	69%	22	14	64%	22	17	77%	22	15	68%	22	15	68%	22	17	77%	22	13	59%
P	SECOND GRADE	52%	21	10	48%	21	13	62%	21	14	67%	21	11	52%	21	8	38%	21	9	43%
Q	SECOND GRADE	54%	23	16	70%	23	15	65%	23	14	61%	23	12	52%	23	9	39%	23	9	39%
R	SECOND GRADE	66%	20	14	70%	20	13	65%	20	12	60%	20	15	75%	20	12	60%	20	13	65%
S	SECOND GRADE	81%	17	15	88%	17	9	53%	17	13	76%	17	16	94%	17	16	94%	17	14	82%
T	SECOND GRADE	42%	21	14	67%	21	8	38%	21	7	33%	21	9	43%	21	9	43%	21	6	29%
U	THIRD GRADE	67%	22	14	64%	22	11	50%	22	17	77%	22	15	68%	22	16	73%	22	16	73%
V	THIRD GRADE	60%	22	14	64%	22	14	64%	22	13	59%	22	14	64%	22	8	36%	22	16	73%
W	THIRD GRADE	81%	18	14	78%	18	15	83%	18	17	94%	18	15	83%	18	14	78%	18	13	72%
X	THIRD GRADE	71%	23	18	78%	23	18	78%	23	16	70%	23	15	65%	23	16	70%	23	15	65%
Y	THIRD GRADE	74%	22	17	77%	22	19	86%	22	18	82%	21	16	76%	21	13	62%	21	12	57%
Z	THIRD GRADE	91%	21	20	95%	21	19	90%	21	19	90%	20	18	90%	20	19	95%	20	17	85%
AA	THIRD GRADE	82%	19	18	95%	20	17	85%	20	17	85%	20	18	90%	20	14	70%	20	14	70%
AB	FOURTH GRADE	31%	23	6	26%	24	7	29%	23	9	39%	27	7	26%	27	10	37%	27	8	30%
AC	FOURTH GRADE	51%	26	13	50%	26	10	38%	26	12	46%	26	14	54%	26	14	54%	26	16	62%
AD	FOURTH GRADE	44%	25	14	56%	24	11	46%	24	11	46%	24	10	42%	24	11	46%	24	7	29%
AE	FOURTH GRADE	74%	27	24	89%	27	24	89%	27	21	78%	26	18	69%	26	20	77%	26	18	69%
AF	FOURTH GRADE	81%	25	21	84%	25	19	76%	25	22	88%	25	16	64%	26	24	92%	26	21	81%
AG	FOURTH GRADE	58%	26	15	58%	26	14	54%	26	15	58%	26	17	65%	26	16	62%	26	13	50%
AH	FIFTH GRADE	30%	24	3	13%	25	5	20%	25	6	24%	25	13	52%	25	10	40%	25	8	32%
AI	FIFTH GRADE	37%	22	7	32%	22	6	27%	22	7	32%	22	10	45%	22	11	50%	22	8	36%
AJ	FIFTH GRADE	40%	24	3	13%	24	8	33%	24	14	58%	24	12	50%	24	12	50%	24	9	38%
AK	FIFTH GRADE	56%	22	12	55%	22	11	50%	22	14	64%	23	13	57%	23	16	70%	23	10	43%
AL	FIFTH GRADE	44%	24	11	46%	23	10	43%	23	9	39%	23	9	39%	23	14	61%	23	8	35%
AM	FIFTH GRADE	83%	25	21	84%	25	22	88%	25	20	80%	25	18	72%	25	21	84%	25	23	92%
		61%			61%			61%			63%			63%			62%			55%

Kindergarten Average	55%
First Grade Average	67%
Second Grade Average	67%
Third Grade Average	75%
Fourth Grade Average	56%
Fifth Grade Average	49%

Feb 22-28	Mar 1-7	Mar 8-14	Mar 22-28	Mar 29 - Apr 2	Apr 5-11
55%	55%	58%	58%	52%	49%
57%	56%	57%	56%	59%	50%
63%	61%	65%	64%	64%	54%
64%	63%	68%	71%	72%	57%
65%	67%	69%	72%	73%	57%
59%	66%	68%	68%	71%	54%

DreamBox Math Student Tracker

Dreambox Incentive Tracker			Feb 22-28			Mar 1-7			Mar 8-14			Mar 22-28			Mar 29 - Apr 2			Apr 5-11		
Classroom Teacher	Grade	Overall Percent Met	Classroom Student Count	Students who completed 5 Lessons	Percent Met	Classroom Student Count	Students who completed 5 Lessons	Percent Met	Classroom Student Count	Students who completed 5 Lessons	Percent Met	Classroom Student Count	Students who completed 5 Lessons	Percent Met	Classroom Student Count	Students who completed 5 Lessons	Percent Met	Classroom Student Count	Students who completed 5 Lessons	Percent Met
A	KINDERGARTEN	68%	20	17	85%	20	17	85%	20	15	75%	20	6	30%	20	14	70%	20	13	65%
B	KINDERGARTEN	34%	17	7	41%	17	6	35%	17	4	24%	16	4	25%	16	9	56%	16	4	25%
C	KINDERGARTEN	52%	22	12	55%	22	13	59%	22	12	55%	22	11	50%	21	10	48%	21	10	48%
D	KINDERGARTEN	47%	20	8	40%	20	11	55%	21	12	57%	21	8	38%	21	9	43%	21	10	48%
E	KINDERGARTEN	78%	19	17	89%	19	14	74%	20	19	95%	19	14	74%	19	16	84%	19	10	53%
F	KINDERGARTEN	28%	20	3	15%	20	2	10%	20	6	30%	20	10	50%	20	9	45%	20	4	20%
G	FIRST GRADE	68%	18	12	67%	18	13	72%	18	11	61%	18	12	67%	18	12	67%	18	13	72%
H	FIRST GRADE	75%	17	11	65%	17	14	82%	17	12	71%	17	12	71%	17	14	82%	17	13	76%
I	FIRST GRADE	64%	16	9	56%	16	10	63%	16	8	50%	16	12	75%	15	12	80%	15	9	60%
J	FIRST GRADE	51%	17	4	24%	17	12	71%	17	5	29%	17	13	76%	17	10	59%	17	8	47%
K	FIRST GRADE	75%	19	13	68%	19	17	89%	19	17	89%	19	12	63%	19	17	89%	19	10	53%
L	FIRST GRADE	32%	19	7	37%	19	7	37%	19	6	32%	19	3	16%	19	7	37%	19	6	32%
M	FIRST GRADE	44%	20	11	55%	19	7	37%	19	11	58%	19	6	32%	19	8	42%	19	8	42%
N	SECOND GRADE	44%	22	11	50%	22	14	64%	22	10	45%	22	5	23%	22	11	50%	22	7	32%
O	SECOND GRADE	55%	22	16	73%	22	15	68%	22	11	50%	22	12	55%	22	12	55%	22	6	27%
P	SECOND GRADE	28%	21	6	29%	21	11	52%	21	6	29%	21	5	24%	21	3	14%	21	4	19%
Q	SECOND GRADE	30%	23	8	35%	23	12	52%	23	6	26%	23	5	22%	23	6	26%	23	4	17%
R	SECOND GRADE	51%	20	7	35%	20	13	65%	20	11	55%	20	7	35%	20	12	60%	20	11	55%
S	SECOND GRADE	84%	17	13	76%	17	13	76%	17	10	59%	17	17	100%	17	16	94%	17	17	100%
T	SECOND GRADE	46%	21	13	62%	21	9	43%	21	8	38%	21	9	43%	21	9	43%	21	10	48%
U	THIRD GRADE	64%	22	12	55%	22	13	59%	22	15	68%	22	15	68%	22	15	68%	22	15	68%
V	THIRD GRADE	47%	22	5	23%	22	13	59%	22	10	45%	22	10	45%	22	11	50%	22	13	59%
W	THIRD GRADE	74%	18	9	50%	18	10	56%	18	16	89%	18	15	83%	18	15	83%	18	15	83%
X	THIRD GRADE	71%	23	17	74%	23	17	74%	23	17	74%	23	14	61%	23	19	83%	23	14	61%
Y	THIRD GRADE	59%	22	12	55%	22	13	59%	22	13	59%	21	13	62%	21	13	62%	21	12	57%
Z	THIRD GRADE	89%	21	17	81%	21	19	90%	21	18	86%	20	19	95%	20	18	90%	20	18	90%
AA	THIRD GRADE	76%	19	15	79%	20	16	80%	20	17	85%	20	15	75%	20	13	65%	20	14	70%
AB	FOURTH GRADE	37%	23	7	30%	24	9	38%	23	14	61%	27	8	30%	27	12	44%	27	6	22%
AC	FOURTH GRADE	38%	26	8	31%	26	10	38%	26	8	31%	26	12	46%	26	10	38%	26	12	46%
AD	FOURTH GRADE	41%	25	13	52%	24	12	50%	24	11	46%	24	8	33%	24	7	29%	24	8	33%
AE	FOURTH GRADE	79%	27	21	78%	27	22	81%	27	22	81%	26	21	81%	26	22	85%	26	18	69%
AF	FOURTH GRADE	80%	25	21	84%	25	20	80%	25	20	80%	25	19	76%	26	22	85%	26	19	73%
AG	FOURTH GRADE	65%	26	17	65%	26	17	65%	26	18	69%	26	18	69%	26	18	69%	26	14	54%
AH	FIFTH GRADE	33%	24	5	21%	25	6	24%	25	6	24%	25	7	28%	25	13	52%	25	12	48%
AI	FIFTH GRADE	44%	22	7	32%	22	10	45%	22	9	41%	22	10	45%	22	12	55%	22	10	45%
AJ	FIFTH GRADE	33%	24	4	17%	24	8	33%	24	9	38%	24	10	42%	24	9	38%	24	8	33%
AK	FIFTH GRADE	56%	22	13	59%	22	9	41%	22	15	68%	23	15	65%	23	12	52%	23	11	48%
AL	FIFTH GRADE	54%	24	10	42%	23	10	43%	23	16	70%	23	15	65%	23	14	61%	23	10	43%
AM	FIFTH GRADE	81%	25	19	76%	25	23	92%	25	20	80%	25	19	76%	25	20	80%	25	21	84%
		56%			53%			59%			57%			54%			60%			52%
Kindergarten Average	51%				54%			53%			56%			44%			58%			43%
First Grade Average	58%				51%			51%			54%			51%			57%			44%
Second Grade Average	58%				55%			59%			61%			58%			61%			53%
Third Grade Average	69%				55%			59%			61%			62%			67%			55%
Fourth Grade Average	57%				53%			62%			56%			69%			70%			55%
Fifth Grade Average	50%				49%			65%			55%			67%			70%			55%

Appendix E

SCPS Digital Resources Survey

SCPS Lexia Core5 Reading and DreamBox Math Survey-Teachers

Teachers,

In partnership with Stafford and as part of the completion of our doctoral studies at Vanderbilt, we are conducting research on digital instructional tools, specifically Lexia Core5 Reading (Core5 or PowerUp) and DreamBox Math.

This 15-minute or less survey asks about your use of Lexia Core5 Reading (Core5 or PowerUp) and/or DreamBox Math.Your participation is entirely voluntary.

Please complete the survey by Friday, September 30, 2022, by 11:59 pm EST.

Purpose of the Study
You are being asked to participate in this research study to help us better understand the impact of professional development and school supports on the ways in which Lexia Core5 Reading and DreamBox Math were implemented in SCPS.

Thank you for your participation.

Procedures
This study will take approximately 15 minutes. You will be asked questions about your school site location for the 2021-2022 school year, teaching subject area(s), current role, and assigned institutional grade. You will be asked a few questions on a web-based survey about your use (e.g., frequency) of Lexia Core5 Reading and/ or DreamBox Math during the 2021-2022 school year. We are also very interested in your thoughts on this digital curriculum and impact on student learning.

Expected Costs
There are no costs.

Confidentiality
All efforts, within reason, will be made to keep your personal information in our research record confidential, but total confidentiality cannot be guaranteed. Diligent efforts will be made to ensure that your participation in this study and your responses remain confidential. Your name will not appear in our research and recommendations. Results will be presented so that no person is individually identifiable. Researchers will remove any personally identifying

no person is individually identifiable. Researchers will remove any personally identifying information, assigning a numeric code to identify participants and schools. Only key study personnel will have access to the coding system. Artifacts and research records, including audio recordings, will be stored securely, and only researchers will have access to these records for up to 5 years, at which time they will be destroyed.

Rights of Research Subjects

Your participation in this research study is voluntary. You are also free to withdraw from this study at any time. In the event new information becomes available that may affect the risks or benefits associated with this research study or your willingness to participate, you will be notified so that you can make an informed decision on whether or not to continue your participation in this study.

Potential Benefits to Subjects and/or Society

While there are no direct benefits to you for participation, we hope you will find value impacting your division at large. Many thanks for your consideration and all your work with our country's children and youth.

Compensation For Participation

There is no compensation for participation.

Potential Risks and Discomforts

- Online data being hacked or intercepted: Anytime you share information online, there are risks. We are using a secure system to collect this data, but we cannot completely eliminate this risk.
- Breach of confidentiality: There is a chance your data could be seen by someone who shouldn't have access to it. We're minimizing this risk in the following ways: We will remove identifying information from the data set. We will store all electronic data on a password-protected, encrypted computer.
- It is unlikely that this experience will upset you more than another experience with someone you may or may not know very well. If you find yourself upset after the study, you can call the PI, Tonya Williams Leathers, at (919)641-5981 or their faculty advisor Claire Smrekar at (615)322-8001.
- Finally, time spent participating in this study may be inconvenient, and you may find the questionnaires repetitive or boring.

Identification of investigators

Thank you for completing this survey and providing essential feedback regarding the implementation of Lexia Core5 Reading (Core5 or PowerUp) and/ or DreamBox Math within Stafford County Public Schools. If you have any questions or would like to participate in this work, please contact us at tonya.m.williams.leathers@Vanderbilt.Edu.

For additional information about giving consent or your rights as a participant in this study, please feel free to contact the Vanderbilt University Institutional Review Board Office at (615) 322-2918 or toll-free at (666) 224-8273.

All reasonable efforts will be made to keep the personal information in your research record private and confidential, but absolute confidentiality cannot be guaranteed. Your information may be shared with institutional and/or governmental authorities, such as the Vanderbilt University Institutional Review Board, if you or someone else is in danger or if we are required to do so by law.

Beginning of Survey:

Background Information

Q1. School Site (2021-22 school year)

Q2. Did you teach any of the subjects below in the 2021-22 school year? Select all that apply.

- [ ] Language Arts
- [ ] Math
- [ ] Reading elective/intervention
- [ ] Math elective/intervention

Q3. What was your role at your school site during the 2021-22 school year?

- ○ Classroom Teacher
- ○ Reading Specialist
- ○ Math Specialist
- ○ Special EducationTeacher
- ○ English as a Second Language (ESL) Teacher
- ○ Gifted Teacher
- ○ Other

Q4. What grade(s) are you assigned? Select all that apply.

- [ ] K
- [ ] 1st
- [ ] 2nd
- [ ] 3rd
- [ ] 4th
- [ ] 5th

Lexia

Q5. Did you utilize Lexia (Core5 or PowerUp) with students during the 2020-21 school year?

- ○ Yes
- ○ No

Q6. Did you utilize Lexia (Core5 or PowerUp) with students during the 2021-22 school year?

- ○ Yes
- ○ No

Q7. Did you receive training (how to use the program) in the 2021-22 school year prior to implementing Lexia?

- ○ Yes
- ○ No

Q8. Please indicate your level of agreement with each of the following statements regarding Lexia.

Professional Development is defined as structured professional learning that results in changes to teacher knowledge and practices, and improvements in student learning outcomes. Seven features usually comprise effective professional development: content-focused, incorporates active learning, supports collaboration, uses models of effective practice, provides coaching and expert support, offers feedback and reflection, and sustained duration.

	Strongly Disagree	Disagree	Agree	Strongly Agree
I have received sufficient professional development on implementing Lexia.	○	○	○	○
I have sufficient opportunity to receive additional professional development or support using Lexia.	○	○	○	○
I have questions/concerns about implementing Lexia in my classroom.	○	○	○	○
I feel confident in my ability to implement Lexia in my classroom.	○	○	○	○
I feel knowledgeable about the components of Lexia.	○	○	○	○

Q9. How did you utilize Lexia with students? Select all that apply.

- ☐ As an intervention with all students
- ☐ As an intervention with a limited number of students
- ☐ As a part of core instruction with all students
- ☐ As a part of homework
- ☐ Other

Q10. How frequently did your students utilize Lexia in your classroom?

- ○ Daily-Students accessed the program as a part of their instructional programming
- ○ Often-Students accessed the program 2-3 days as part of the classroom routine
- ○ Weekly-Students accessed the program as a part of the classroom routine
- ○ Occasionally-Students accessed the program when the time was allocated
- ○ Never-Students were not assigned Lexia as a part of classwork

Q11. Did you teach any flagged lessons to students?

Lessons are flagged when a student drops to instruction for the fourth time on a particular skill in Word Study or Grammar.

- ◯ Yes
- ◯ No

Q12. How often did you view student and class reports on the Lexia platform?

- ◯ Daily
- ◯ Weekly
- ◯ Monthly
- ◯ Rarely
- ◯ Never

Q13. Based on your experiences with Lexia, how did the program impact student learning?

Dreambox

Q14. Did you utilize Dreambox with students in the 2020-21 school year?

- ◯ Yes
- ◯ No

Q15. Did you utilize Dreambox with students during the 2021-22 school year?

- ◯ Yes
- ◯ No

Q16. Did you receive training (how to use the program) in the 2021-22 school year prior to implementing Dreambox?

- ◯ Yes
- ◯ No

Q17. Please indicate your level of agreement with each of the following statements regarding Dreambox.

Professional Development is defined as structured professional learning that results in changes to teacher knowledge and practices, and improvements in student learning outcomes. Seven features usually comprise effective professional development: content-focused, incorporates active learning, supports collaboration, uses models of effective practice, provides coaching and expert support, offers feedback and reflection, and sustained duration.

	Strongly Disagree	Disagree	Agree	Strongly Agree
I have received sufficient professional development on	◯	◯	◯	◯

	Strongly Disagree	Disagree	Agree	Strongly Agree
implementing Dreambox.				
I have sufficient opportunity to receive additional professional development or support using Dreambox.	○	○	○	○
I have questions/concerns about implementing Dreambox in my classroom.	○	○	○	○
I feel knowledgeable about the components of Dreambox.	○	○	○	○
I feel confident in my ability to implement Dreambox in my classroom.	○	○	○	○

Q18. How did you utilize Dreambox with students? Select all that apply.

- ☐ As an intervention with all students
- ☐ As an intervention with a limited number of students
- ☐ As a part of core instruction with all students
- ☐ As a part of homework
- ☐ Other

Q19. Did you have a structure or process in place to teach students lessons based on Dreambox performance?

- ○ Yes
- ○ No

Q20. How frequently did your students utilize Dreambox in your classroom?

- ○ Daily-Students accessed the program as a part of their instructional programming
- ○ Often-Students accessed the program 2-3 days as part of the classroom routine
- ○ Weekly-Students accessed the program as a part of the classroom routine
- ○ Occasionally-Students accessed the program when the time was allocated
- ○ Never-Students were not assigned Dreambox as a part of classwork

Q21. How often did you view student and class reports on the Dreambox platform?

- ○ Daily
- ○ Weekly
- ○ Monthly
- ○ Rarely
- ○ Never

Q22. Based on your experiences with Dreambox, how did the program impact student learning?

School Support

Q23. Please indicate your level of agreement with each of the following statements regarding school support.

	Strongly Disagree	Disagree	Agree	Strongly Agree	N/A
I was aware of school expectations regarding Lexia implementation.	○	○	○	○	○
I was aware of school expectations regarding Dreambox implementation.	○	○	○	○	○
I worked in a professional learning community or grade band team to develop practices and instruction using Lexia.	○	○	○	○	○
I worked in a professional learning community or grade band team to develop practices and instruction using Dreambox.	○	○	○	○	○
I was supported by an instructional coach or other staff with my implementation of Lexia throughout the school year.	○	○	○	○	○
I was supported by an instructional coach or other staff with my implementation of Dreambox throughout the school year.	○	○	○	○	○
Time was allocated for implementing Lexia in the master schedule.	○	○	○	○	○
Time was allocated for implementing Dreambox in the master schedule	○	○	○	○	○

Appendix F

Emails to SCPS Stakeholders

August 29, 2022

Email to Project Point of Contact

Dear Dr. Towery,

Thank you for your assistance in contacting the elementary principals in the division. We appreciate your support in encouraging schools to participate in the study around the implementation of Lexia Core5 Reading and/or DreamBox Math in your school.

Could you please share the survey via the qualtrics link with the principals to distribute during a faculty meeting?

Thank you elementary principals and teachers of Stafford County. We are contacting you on behalf of Vanderbilt University to ask you to share with us the Division's work around the implementation of Lexia Core5 Reading and/or DreamBox Math. This survey will take no more than 15 minutes to
complete and is an anonymous survey on your implementation of Lexia Core5 Reading and/or DreamBox Math.

We hope you will choose to participate in this important study that will benefit schools in your division and beyond.

Thank you,
Lisle Bull lisle.bull@vanderbilt.edu
Sarah Evans sarah.l.evans@vanderbilt.edu
Tonya Williams Leathers tonya.m.williams.leathers@vanderbilt.edu

Email to Principals

Dear [Name],

We are contacting you on behalf of Vanderbilt University to ask if you are interested in participating in an interview about the implementation of Lexia Core5 Reading and/or DreamBox Math in your school.

We are contacting you for our study because your school has teachers who have utilized Lexia Core5 Reading
and/ or DreamBox Math.

Should you agree to participate, please let us know some dates that you are available for a 45-60 minute conversation.

We are looking for your support in conducting a focus group with teachers at your school who have implemented Lexia Core5 Reading and DreamBox Math. Could you please share the attached email with them?

We hope you will choose to participate in this important study that will benefit schools in your division and beyond.

We look forward to speaking with you.

Thank you,
Lisle Bull lisle.bull@vanderbilt.edu
Sarah Evans sarah.l.evans@vanderbilt.edu
Tonya Williams Leathers tonya.m.williams.leathers@vanderbilt.edu

August 29, 2022

Email to Division Curriculum Specialists

Dear [Name],

Rebecca Towery has connected us with you as part of a research study on the implementation of Lexia Core5 Reading and DreamBox Math. We are contacting you on behalf of Vanderbilt University to ask you to
share with us the Division's work around the implementation of Lexia Core5 Reading and/or DreamBox Math.

Should you agree to participate, please let us know some dates that you are available for a 45-60 minute conversation.

We are looking for your support in hearing about the professional development provided on Lexia Core5 Reading and DreamBox Math as well as implementation guidance to schools.

We hope you will choose to participate in this important study that will benefit schools in your division and beyond.

We look forward to speaking with you.

Thank you,
Lisle Bull lisle.bull@vanderbilt.edu
Sarah Evans sarah.l.evans@vanderbilt.edu
Tonya Williams Leathers tonya.m.williams.leathers@vanderbilt.edu

August 29, 2022

Email to Teachers

Dear [Name],

We are contacting you on behalf of Vanderbilt University to ask if you are interested in participating in a focus group or interview about the implementation of Lexia Core5 Reading and/or DreamBox Math in your school.

We are contacting you for our study because you have utilized Lexia Core5 Reading and/ or DreamBox Math at a school that is part of this research study.

Should you agree to participate, please let your principal know your interest and availability to meet during your grade level PLCs during October. You may have received a request from your principal to participate as well.

We hope you will choose to participate in this important study that will benefit schools in your division and beyond.

We look forward to speaking with you.

Thank you,
Lisle Bull lisle.bull@vanderbilt.edu
Sarah Evans sarah.l.evans@vanderbilt.edu
Tonya Williams Leathers tonya.m.williams.leathers@vanderbilt.edu

August 29, 2022

Email to Instructional Coach

Dear [Name],

We are contacting you on behalf of Vanderbilt University to ask if you are interested in participating in an interview about the implementation of Lexia Core5 Reading and/or DreamBox Math in your school.

We are contacting you as the instructional coach at a school that utilized Lexia Core5 Reading and/ or DreamBox Math.

Should you agree to participate, please let us know your availability to participate in a 45-60 minute conversation in October.

We hope you will choose to participate in this important study that will benefit schools in your division and beyond.

We look forward to speaking with you.

Thank you,
Lisle Bull lisle.bull@vanderbilt.edu
Sarah Evans sarah.l.evans@vanderbilt.edu
Tonya Williams Leathers tonya.m.williams.leathers@vanderbilt.edu

Appendix G

ANOVA Lexia Core5 Reading Core5 Reading Research Question 4a

ANOVA

Q23

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.016	2	.508	.143	.867
Within Groups	427.049	120	3.559		
Total	428.065	122			

ANOVA

Q23

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	8.779	2	4.390	1.256	.288
Within Groups	419.286	120	3.494		
Total	428.065	122			