

Re-conceptualizing Secondary Literacy:  
Impacts of 21st-Century Literacy Interventions on STEM High School Student  
Achievement

by  
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RE-CONCEPTUALIZING SECONDARY LITERACY

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Achievement

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### Abstract

Rigorous school curriculums and end-of-course (EOC) exams have brought the need for literacy interventions at the high school level to the forefront. As 21st-century learning evolves, curriculum is shifting from traditional teaching to more student-centered approaches that value differentiated literacy instruction. Furthermore, teachers are receiving resources and ongoing professional development on secondary literacy interventions through Ohio literacy grants.

However, the concept of literacy intervention across courses at the high school level is often overlooked due to the assumption that students have mastered reading comprehension in elementary school. The current mixed-methods investigation focuses on the implementation of evidence-based literacy interventions in an Ohio designated Science, Technology, Engineering, and Mathematics (STEM) high school. The purpose of the current study is to determine the impact of 21st-century literacy strategies on student reading levels, as well as student and teacher perceptions of literacy interventions and instruction. The examined literacy strategies include vocabulary instruction, differentiated literacy instruction, and both Fountas' & Pinnell's System of Strategic Actions (SOSA) and Leveled Learning Literacy Intervention (LLI). Results from the current investigation can inform administrators and teachers on the impacts of literacy interventions at the secondary level. Quantitative data results suggest that students grew an average of three Fountas & Pinnell reading levels over one academic year, and an average of five Fountas & Pinnell reading levels over a longitudinal three-year time span when receiving literacy interventions across content areas. Qualitative student interviews demonstrated four emerging themes: Student Perception, Changing of Students'

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Perceptions, Student Perceptions of Instruction, and Students' Perceived Importance of Reading. Additionally, qualitative teacher interviews demonstrated three emerging themes: Teacher Perceptions of Literacy Instruction, Perceived Student Impact, and Support for Literacy Instruction. Student and teacher perceptions regarding literacy interventions aligned with quantitative results in the belief that literacy interventions are impactful if implemented with fidelity.

*Keywords:* 21st-century learning, content literacy, cross-curricular teaching, differentiated instruction, disciplinary literacy, Multi-tiered System of Supports (MTSS)

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## Chapter 1

The need for 21st-century reading interventions at the high school level is becoming clear across the nation due to rigorous standardized state testing and low reading scores; nonetheless, as classroom practices evolve, secondary reading instruction remains controversial. According to Ness (2016), "...a significant number of students struggle with complex academic and literacy tasks they encounter in their content area classes" (p. 60). However, teacher perceptions suggest concerns with standardized test scores, leading them to focus on teaching content rather than teaching students how to effectively comprehend texts. Secondary educators may not understand the relevancy of explicit literacy interventions at the secondary level or may not have received the proper training on how to effectively implement literacy interventions into their specific content courses.

Furthermore, there is a societal perception that students leave elementary school as proficient readers, leading to a stigma that secondary students reading below grade level are low performing. However, "...the needs for reading interventions and the opportunity to learn to read proficiently does not end after the primary grades" (Scammacca et al., 2016, p. 784). Nonetheless, high school students are not receiving the necessary literacy interventions that they need to read at grade level. Failure to identify high school students reading below grade level and to provide the proper literacy interventions can lead students to fall behind both academically and socially. According to the National Center for Education Statistics (NCES) breakdown of 2013 Organisation for Economic Co-operation and Development (OECD) Survey of Adult Skills (PIAAC) data, "Four in five U.S. adults (79 percent) have English literacy skills sufficient to complete tasks that require comparing and contrasting information, paraphrasing, or making low-level inferences of Education", meaning that "43.0 million U.S. adults... possess low literacy

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skills” (para. 4). At the state level, the Ohio Department of Education (ODE) stated that in 2018, 68% of students scored proficient on Ohio’s End-of-Course exam, and 85% of high school students graduated in a timely four years (ODE, 2020a, p. 13). Additionally, at an open-enrollment STEM school located in Mahoning County, Ohio, 26.44% of 87 freshman students from across the county began the 2019-2020 school year reading at a fifth-grade level or below.

Aforementioned statistics validate the importance of policy initiatives which seek “...methods for improving the literacy instruction of secondary school subject area teachers” (Moje, 2008, p. 96). Additionally, ongoing policies are needed that exemplify the need for ongoing professional development and resources that support high school teachers in content literacy and disciplinary literacy instruction across curriculum. Research shows that “...students in Grades 4 to 12 who are not reading at the level expected can also grow into their reading skills” (Scammacca et al., 2016, p. 784). There is a need for improved literacy instruction to ensure the academic growth of high school students. All content areas involve text comprehension; therefore, literacy intervention and instruction across secondary school courses can lead students to become more fluent and confident readers and increase their likelihood of achieving academic and real-world success.

### **Problem Statement**

Increasing complexity of texts and higher expectations of mastering academic standards have drawn attention to low reading comprehension levels among high school readers. Low performing readers are at risk for dropping out of high school, losing confidence, and becoming disengaged in schoolwork (Landreth, 2018). In addition, students are leaving secondary school unprepared for the college curriculum and having to take remedial English classes. Furthermore, research performed by the Annie E. Casey Foundation ([AECF], 2010) suggested that “Every

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student who does not complete high school costs our society an estimated \$260,000 in lost earnings, taxes, and productivity” (para. 2). Hence, low reading levels are directly impacting student morale, high school graduation rates, college and career readiness, and the economy.

To combat low literacy levels, The U.S. Department of Education has awarded grant funding to various states across the nation. The Ohio Department of Education (ODE) recently received two grants from the U.S. Department of Education: the Ohio’s Striving Readers Comprehensive Literacy Grant (SRG) beginning during the 2018-2019 school year and concluding at the end of the 2019-2020 school year, and the Ohio Comprehensive Literacy State Development Grant beginning during the 2020-2021 school year and set to end at the conclusion of the 2023-2024 school year. Past Striving Readers initiatives have “...promoted supplemental interventions for identified struggling readers [and] also have sought methods for improving the literacy instruction of secondary school subject area teachers” (Moje, 2008, p. 96). However, the Striving Readers initiatives only last for a few short years, making it difficult to assess the overall impact of learned interventions and literacy instruction on student achievement. Assessing student gains due to literacy intervention is especially difficult at the secondary level, where many constituents assume that students mastered reading in elementary school.

Ongoing, meaningful professional development and training needs to be provided to help all teachers in various content areas to become more confident in re-conceptualizing literacy in the classroom. Teachers should be familiarizing with modernized reading interventions to improve overall student growth. Cross-content instruction of relevant literacy interventions and personalized learning techniques in secondary schools are needed in order to lead students to become more fluent and confident readers. Therefore, this investigation is needed to provide data

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on the effectiveness of 21st-century evidence-based literacy interventions and instruction across the curriculum.

### **Theoretical Framework**

The implementation of 21st-century literacy interventions in combination with teacher engagement has an overall impact in the learning process. However, many educators are taught traditional teaching methods, which are less personalized and impactful. Teachers need to be aware of different literacy interventions, and which strategies will be the most effective for each student at a specific point during instruction (Fisher et al., 2016, p. 3). High school students read at various levels; therefore, differentiating interventions based on whether a student needs surface-level, or deep-level instruction can assist students in mastering content (Hattie, 2012, p. 110). Personalized, 21st-century literacy instruction can assist students in raising their reading levels and can prevent functional illiteracy.

Being unable to comprehend texts can ultimately impact student self-esteem and create a scenario where students become functionally illiterate, meaning that they are incapable of “... [understanding] complex texts despite adequate schooling, age, language skills, elementary reading skills, and IQ” (Vágvölgyi et al., 2016, p. 1). Maslow’s Hierarchy of Needs (1943) demonstrated the five levels of human needs that contribute to maintaining self-fulfillment. Being functionally illiterate can impact any of the five needs (physiological, safety, belongingness and self-love, esteem, and self-actualization). For example, struggling readers may drop out of high school and become homeless, therefore, lack physiological needs. In addition, struggling high school students may feel unaccomplished and lack esteem needs. Reading comprehension is essential for self-actualization and the achievement of full potential.

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First, an impactful literacy program within a school stems from leadership. Hattie (2012) recognized the need for leaders to motivate

... teachers and students [by] identifying and articulating high expectations for all, consulting with teachers before making decisions that affect teachers, fostering communication, allocating resources, developing organizational structures to support instruction and learning, and regularly collecting and reviewing with teachers data on student learning. (p. 174)

Learning leaders can work to provide ongoing, meaningful professional development to teachers to support the integration of 21st-century literacy interventions across the curriculum.

Teacher mentality and school culture can impact the success of implementing content and disciplinary literacy into high school curriculum. Secondary teachers who maintain the idea that students should have learned to read in primary grades lack openness to change. Moreover, secondary students who are exposed to lower-level texts may feel incapable, disparaged, or bored. Dweck's (2006) concept of a growth mindset is important for leaders and teachers to uphold to be open to putting effort into learning and tailoring literacy practices to their specific content area and student needs. Along with maintaining growth mindsets, teachers need to hold a high level of collective efficacy (Donohoo, 2017), believing in the idea that their students can grow and achieve regardless of literacy levels upon entering high school.

Striving for a continuation of teaching development and believing in students can lead to successful educators; however, the clustering (Deal et al., 2008) of educators can lead to disconnect among content curriculum within an organization. Learning leaders can work towards the establishment of what Gruenert and Whitaker (2015) described as a collaborative school culture. Establishing a collaborative school culture can lead to an organization where educational

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values are shared, and teachers actively work towards growing as professionals and bettering one another (p. 51). Striving to grow professionally and collaborate with colleagues can create a positive learning environment conducive to student achievement and motivation notably in the area of secondary reading instruction.

The Simple View of Reading Model (Gough & Tunmer, 1986) discussed the idea that decoding and language comprehension are symbiotic in that both are required for reading comprehension. The process of decoding is usually taught through direct, phonemic instruction in elementary school. Successful decoding takes place as students begin to understand the sounds of language and the alphabet, and progress to fluently combine phonetic sounds by decoding a text (Fisher et al., 2016, p. 45). According to Fisher et al., there are “...44 phonemes in English and 26 letters”; therefore, “...phonemic awareness, alphabets, phonics, and fluency... are constrained reading skills... because we can count them, they are easily measured, and... they are the foundational reading skills all young readers need to acquire” (p. 46). Without phonemic instruction, students are unable to comprehend language and cannot effectively process and critically think about texts.

Likewise, Scarborough’s Reading Rope (Scarborough, 2001) tied the concepts of language comprehension (background knowledge, vocabulary, language structures, verbal reasoning, literacy knowledge) and word recognition (phonological awareness, decoding, sight recognition) together to create skilled reading. Scarborough (2001) defined skilled reading as “Fluent execution of word recognition and text comprehension” (p. 25). Both Gough’s and Tunmer’s (1986) Simple View of Reading Model and Scarborough’s Reading Rope (2001) demonstrated the need for surface level skill development before meaningful reading comprehension. Without surface level mastery, deep learning cannot take place. However, once

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students are able to comprehend texts, they are able to continue to grow unconstrained reading skills by expanding their vocabulary and comprehending more complex texts (Paris, 2005).

Hence, regardless of teacher certification area, all educators need to be exposed to and supported in word recognition and language comprehension instruction to ensure student support in literacy development.

### **Statement of Purpose**

The aim of the current mixed-methods study is to examine the impacts of 21st-century literacy interventions on student achievement. Differentiated, 21st-century literacy interventions were incorporated into ninth- and 10th-grade English classrooms, as well as into the content areas of history, science, and math. Also, small groups of students received Tier 2 reading intervention in the form of Fountas' and Pinnell's LLI. Student reading levels were assessed and examined quantitatively throughout the course of a one- to three-year time span. Furthermore, data regarding student and teacher perceptions of 21st-century literacy intervention and instruction were collected and examined qualitatively.

Results of this study are demonstrated by assessing student benchmarking scores using Fountas' & Pinnell's (2016) *Benchmark Assessment System 2 (BAS 2)* during the 2017-2018, 2018-2019, and 2020-2021 school years. Findings from this study could be used to inform administrators and educators on the effectiveness of 21st-century literacy interventions used in English classrooms and in the content areas of history, science, and math. Findings may also offer insight into the effectiveness of LLI for Tier 2 instruction. Furthermore, findings could assist educators on understanding both teacher and student perceptions of 21st-century literacy interventions and instruction at the high school level. This study is intended to motivate secondary administrators and teachers to put aside the stigma that high school students should

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have mastered reading comprehension in elementary school, and instead, learn how to effectively embed evidence-based literacy practices into all classrooms.

### **Research Questions**

This research examines the impact of 21st-century reading intervention on high school student achievement. This study also examines the impact of supplemental LLI intervention. In addition, this study examines high school student and teacher perceptions of 21st-century literacy interventions and instruction. This study investigates the following research questions:

1. What is the impact of personalized, 21st-century literacy interventions on student reading levels over the course of one academic year?
  - a. Is there a sustained impact of 21st-century literacy interventions on student reading levels when examined across three academic years?
2. What are perceptions that high school students have in regard to literacy interventions and instruction received throughout their education?
3. What are perceptions that high school teachers have in regard to implementing 21st-century literacy interventions into their classrooms?

### Definition of Key Terms

- *21st-Century Learning*- student-centered, data-driven instruction focused on foundational knowledge, humanistic knowledge, and meta knowledge (Kereluik et al., 2013, p. 130).
- *Basic Reading Inventory*- a basic reading screener used to determine if a student is reading at a dependent, instructional, or frustration level (Johns et al., 2017, p. 10)
- *Content Literacy*- focuses on general literacy strategies that can be used for reading comprehension across all content areas. Content literacy can assist readers in “...making sense of a disciplinary text” (Chauvin & Theodore, 2015, p. 2).
- *Cross-Curricular Teaching*- teaching concepts and skills across multiple disciplines (Savage, 2011)
- *Differentiated Instruction*- adjusting instruction and assessments to suit different learning levels and styles of students (Hattie, 2012, p.109)
- *Disciplinary Literacy*- focuses on “...the specialized knowledge and abilities” specific to the academic course content (Shanahan & Shanahan, 2012, p. 7)
- *Fountas & Pinnell Benchmark Assessment System 2 (BAS 2)* - Benchmarking system that provides teachers with “...tools and texts to observe and quantify specific reading behaviors, and then interpret and use that data to plan meaningful instruction” (Fountas & Pinnell, 2020, para. 2). The *BAS 2* assesses students reading accuracy and comprehension to determine reading levels from level L (third grade) through level Z (eighth grade).
- *Fountas & Pinnell Prompting Guide*- Resource that provides educators with text questions to guide “...readers’ thinking before, during, and after reading” (Fountas & Pinnell, 2017c, p. 1). Questions are organized by thinking within the text, about the text,

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and beyond the text, and encourage students to think strategically through writing and discussion.

- *Leveled Literacy Intervention (LLI)* - Small groups of students with similar benchmark assessment scores receive 30 to 45-minutes of supplemental literacy instruction four to five times per week (Fountas & Pinnell, 2017b, 2021). Students move up a literacy continuum as they progress through the program, and ultimately test out at level Z (Fountas & Pinnell, 2017a).
- *Literature Circles*- literacy intervention where students choose books at their reading level with the support of their instructor; students are then taught to think critically about and reflect on the text in small group discussion with peers (Ragland & Palace, 2017, p. 36)
- *Multi-tiered System of Supports (MTSS)*- data acquisition and analysis determines Tier 1 core instruction, Tier 2 targeted intervention, and Tier 3 intensive intervention to support all learners (Positive Behavior Interventions and Supports [PBIS], 2019)
- *Three-Phase Model*- Model demonstrating the three-phases of learning created by Fisher et al. (2016); surface-level-learning first level of learning involves the basic acquisition of knowledge, deep-level-learning involves more critical thinking and connection of previous knowledge, and transfer involves a connection of knowledge across contents and situations

### **Overview of Methodology**

This mixed-methods study determines the impact of 21st-century literacy interventions on ninth- and 10th-grade student achievement. This longitudinal study took place over the course of three years and was broken up into three phases. Phase I of this study took place during the

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2018-2019 school year, Phase II of this study took place during the 2019-2020 school year, and Phase III of this study took place during the 2020-2021 school year. During each phase, high school students received 21st-century literacy interventions, with a small number of students receiving supplemental LLI instruction regularly. Literacy interventions were used and instruction took place in the content areas of English, history, science, and math, as well as during LLI.

First, quantitative, student-benchmarking data for reading performance and student AIR test data were collected and analyzed using general linear modeling (GLM). Second, qualitative data were collected through the form of structured interviews where students were asked a series of questions regarding their attitudes towards reading interventions and instruction received throughout their education. Teachers were asked a series of questions regarding their attitudes towards the implementation of 21st-century literacy interventions in their respective content courses. Qualitative data were analyzed using data coding.

### **Significance of Study**

Bringing opportunity and change to literacy in secondary schools requires an enormous shift in cultural awareness within our school systems (Moje, 2008), but awareness of the reading epidemic taking place within secondary schools is a place to start. Implementing 21st-century, evidence-based reading interventions in the secondary classroom creates a cultural shift and provides hope for low performing students. A growth mindset needs to be embraced by administrators and educators alike so that all teachers can confidently understand and teach literacy interventions at the high school level. Many reading interventions “...used successfully with younger readers can be easily adapted for use with older readers to result in interventions that are both engaging and effective” (Landreth, 2018, p. 108). Re-conceptualizing literacy

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interventions to fit the needs of secondary readers should ultimately improve student reading levels, as well as increase confidence and performance in the classroom.

### **Limitations**

Limitations regarding the internal validity of this study include scheduling conflicts, snow days, teacher absences, student absences, and environmental limitations. Resentful demoralization may also take place due to students feeling insecure about reading out loud during benchmarking sessions; however, it seems unlikely due to most students generally wanting to perform well to demonstrate growth and maintain positive relationships with instructors. Diversity within the sample is limited due to the sample being composed of students and teachers from the same building. However, the experimental results produce potentially higher reliability and validity due to a longitudinal design covering three years of intervention data (Trochim et al., 2008). Potential generalizability could take place when applied to school districts with a comparable population that integrate similar 21st-century literacy interventions and teacher collaboration models.

### **Summary**

Overall, the implementation of literacy interventions at the high school level could potentially increase student achievement. A variety of reading interventions could be modified to fit the individual needs of high school students and promote literacy growth. The current three-year longitudinal study analyzes the impacts of 21st-century literacy interventions and small group, supplemental LLI instruction on student achievement in a ninth- and 10th-grade high school setting. The next chapter will review literature on past and current literacy policies and programs implemented in Ohio. Moreover, Chapter 2 will discuss the need for evidence-based

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literacy interventions, as well as elaborate on evidence-based literacy interventions used in this study.

Chapter 2

**Review of Literature**

Analyzing the history of reading interventions and their impacts on struggling readers allows researchers to determine which interventions are the most effective for ensuring student growth. Furthermore, past literacy interventions can continue to be studied and elaborated upon to ensure 21st-century instruction takes place across the curriculum. Research articles on the history of reading instruction are limited, and reading interventions used vary. However, it is clear that literacy has and continues to play a crucial role in American education and society.

In 1917, during World War I, “The U.S. military discovered that thousands of soldiers were unable to comprehend simple written instructions, bringing the issue of older struggling readers to the forefront as a matter of national security” (Smith, 2002, as cited in Scammacca et al., 2016, p. 762). As a result, literacy strategies transitioned from rote memorization to phonemic instruction and strategies that would now be considered early response to intervention (RTI) strategies. Students were screened for reading fluency and comprehension at the beginning of each school year, with identified readers receiving small group instruction, or individualized instruction with a reading specialist (Scammacca et al., p. 763). However, early 1900 literacy instruction involved remedial or supplemental small group literacy interventions that were scripted rather than student-centered, and usually involved only students with learning disabilities.

In addition to small group and individualized literacy interventions, students were given psychotherapy in combination with reading instruction with hopes to improve classroom behavior and anxiety towards reading out loud (Scammacca et al., 2016, p. 768). However, these strategies “...were focused primarily at the word level, emphasizing improving struggling

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readers' word recognition and oral reading fluency" (p. 781). Students were taught surface-level reading strategies but deep-level learning (critical thinking) was rarely taking place. Transference of knowledge from the classroom to the real world was a challenge.

Again, during World War II, the United States military "...discovered that many soldiers were functionally illiterate" (Smith, 2002, as cited in Scammacca et al., 2016, p. 769). Therefore, the government began to fund lower-income schools, as well as provide money for more reading intervention research programs (p. 771). As a result of government-funded research, findings in the 1970s indicated the importance of teaching students the process of self-assessment, with the intention of students assessing how they learned as individuals (p. 772). Furthermore, teaching "... struggling readers to make meaning out of text became more of a priority" (p. 781). The aforementioned literacy interventions and teaching methods demonstrated an instructional shift from the 1800s, where alphabetic spelling drills and oral repetition were the main reading comprehension strategies used (Bennett, 1998, p. 10). Nonetheless, current literacy rates and low standardized test scores reflect the need for reading instructional practices to continue to be researched and improved.

Literacy continues to remain an ongoing problem in the United States. Gonzalez et al. (2018) stated that "According to the Program for the International Assessment of Adult Competencies, 14 percent of American youth and young adults possess limited literacy skills" (p. 1). At the state level, "53% of Ohio's ACT test-takers scored below the remediation-free level on the English language arts assessment" (ODE, 2020a, p. 13). Students need continued literacy interventions and instruction throughout high school. Furthermore, teachers need ongoing support and resources to effectively implement 21st-century literacy interventions across the curriculum. The ODE is recognizing the need for literacy improvement in K-12 schools, stating

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the intent to “...build Ohio’s capacity for implementing evidence-based language and literacy instruction for all learners” (2020a, p. 49). With secondary reading intervention and instruction gaining momentum in Ohio, it is imperative that Ohio continues to support literacy within K-12 schools, especially at the local level.

### **History of Reading in Ohio**

Due to the opposition of child labor in Ohio, the Bing Act of 1921 was passed by the Ohio legislature, mandating that children from ages six to 18 had to attend school (Ohio History Central, n.d.). Ohio school districts had a responsibility to fund public education; school buildings were needed as well as student transportation. During the first half of the 20th-century, a progressive educational movement took place, where rote memorization was no longer at the forefront. Philosophers such as John Dewey believed that “...education and learning were interactive processes and students should not only interact with their environment but also play an active role in their learning” (Conner & Bohan, 2014 p. 92). Therefore, more interactive learning began to take place in the classroom.

### ***Federal Laws Passed***

Due to segregation, African American students in Ohio were not receiving equal rights to education. The 1954 *Brown v. the Board of Education* United States Supreme Court case established the unconstitutionality of segregated schools (Teaching Tolerance, 2004). Although illegal, some schools around the United States and Ohio remained segregated until the late 1980s.

In hopes to combat learning inequalities, President Lyndon B. Johnson signed the Civil Rights Act of 1964, preventing districts or schools that discriminated based on race from receiving federal funds and “...authorized the Office of Education... to assist with school

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desegregation” (History.com, para. 16). President Johnson also signed the Secondary Education Act (ESEA) of 1965 which held the federal government responsible for distributing more funding to schools (Zelizer, 2015). As a result of ESEA, Title I (federal funding dedicated to lower-income school districts) and Head Start (preschool program for lower-income families) were created. Despite his efforts, inequalities continued to persist among school districts. In 2002, Former President George W. Bush signed the No Child Left Behind Act (NCLB), a predecessor to the ESEA (Klein, 2015). The NCLB law “...increased the federal role in holding schools responsible for the academic progress of all students” (para. 5) and held participating schools responsible for testing “...students in reading and math in grades 3 through 8 and once in high school” (para. 6). Although replaced by the Every Student Succeeds Act (ESSA), the NCLB act was in effect from 2002-2015 and brought standardized testing to the forefront of instruction.

Currently, ESSA, signed into effect by former President Barack Obama, in 2015, allowed states to have more leeway on establishing long-term and short-term goals focused on “...proficiency on tests, English-language proficiency, and graduation rates” (Klein, 2016, para. 1). However, schools still have to implement standardized testing, as well as adhere to the Common Core State Standards, or another set of approved standards. The U.S. Department of Education (2015) stated the purpose of ESSA: “The purpose of this title is to provide all children significant opportunity to receive a fair, equitable, and high-quality education, and to close educational achievement gaps” (para. 1). Despite the intentions of the Federal government, there are clear discrepancies between equitable education and current student achievement at the state and local levels.

ODE (2020a) described “...schools serving students from economically disadvantaged backgrounds... as high needs schools” (p. 11). In 2018, “...almost half... of Ohio’s elementary,

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middle and high schools were high needs schools” (p. 11) and struggled with literacy. For example, students who did not score proficient on English Language Arts (ELA) assessments consisted of “71.4% [of students who] are economically disadvantaged, 30.3% [of] students with disabilities, 4.6% [of students who] are English learners”; furthermore, more than half of students scoring below proficient attend high-need schools (p. 13). ODE’s data demonstrate a clear need for impactful literacy interventions and resources for schools across Ohio.

### ***Third Grade Reading Guarantee***

The Third Grade Reading Guarantee (TGRG) arose in 2012 because of research that supported the increase of struggling high school readers. In 2010, research performed by the AECF attested to the importance of proficient reading by the fourth grade (AECF, 2010, para. 1). The foundation’s research ultimately suggested that “Every student who does not complete high school costs our society an estimated \$260,000 in lost earnings, taxes, and productivity” (para. 2) and called for lawmakers to “focus on school readiness, school attendance, summer learning, family support, and high-quality teaching” (para. 1). Hence, the TGRG was enacted due to low literacy levels negatively impacting school dropout rates, college and career readiness, and the economy.

According to the ODE (2020b), the TGRG’s purpose is “...to identify students from kindergarten through grade 3 that [*sic*] are behind in reading” and “...provide help and support to make sure students are on track for reading success by the end of third grade” (para. 1). Schools are expected to provide their own supplemental materials to support students who are not reading at the third-grade level and put students on reading improvement plans (RIMPS). Furthermore, if students do not pass the initial third-grade assessment, they have the opportunity to take vendor-approved assessments (IOWA, North West Evaluation Association [NWEA] Map, IReady, Terra

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Nova 3, Standardized Test for the Advancement of Reading [STAR]), which also require funding (Galbincea, 2019, para. 10). If students do not pass the third-grade assessment or the vendor-approved assessments, they are held back in reading but are able to move to the fourth grade in other content areas. The accountability that schools face due to the TGRG has resulted in opposition among involved constituents.

Research shows that schools with low SES generally have more below grade-level readers, thus contributing to lower funding and lack of educational tools to promote reading instruction (Shoaff, 2017, p. 12). Nonetheless, with the publicly stated issues of low literacy levels impacting dropout rates and the economy, all schools need to adhere to TGRG requirements regardless of SES. Research claims that the impact of the TGRG on student achievement since the implementation in 2012 is minimal, with further review necessary to determine the positive or negative implications of the policy (Logan et al., 2018). Currently, the TGRG remains the proposed and implemented solution to unfit grade promotions and low reading levels impacting poverty and loss of economic earnings.

### ***Multi-tiered System of Supports***

A multi-tiered system of support (MTSS) is a framework encouraged by the ESSA act, which requires all schools to have a developed, data-driven plan in place to support student academic and behavioral needs. The overall goal of MTSS is to provide a comprehensive framework for schools to focus on assessment, instruction, and supplemental interventions to support student academic achievement and behavior. *Ohio's Plan to Raise Literacy Achievement* discussed the impact of MTSS on literacy instruction. According to ODE (2020a), "...supports for reading includes full access to grade-level instruction for all learners that is differentiated and designed to meet the needs of all learners (Tier 1) and additional targeted (Tier 2) and/or

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intensive intervention (Tier 3) for learners experiencing difficulties” (p. 7). Ohio’s goal is to provide professional development to teachers to promote ongoing student assessment and intentional data-driven instruction.

### ***Ohio’s Plan to Raise Literacy Achievement***

*Ohio’s Plan to Raise Literacy Achievement* is intended to act as a guide for promoting evidence-based language and literacy development for children from birth to Grade 12 (ODE, 2020a, p. 1). The plan falls under Ohio’s Strategic Plan for Education, *Each Child Our Future*. Figure 1 demonstrates continuing, evidence-based support for language and literacy development across a “Language and Literacy Development Continuum.”

### **Figure 1**

#### *Language and Literacy Development Curriculum*

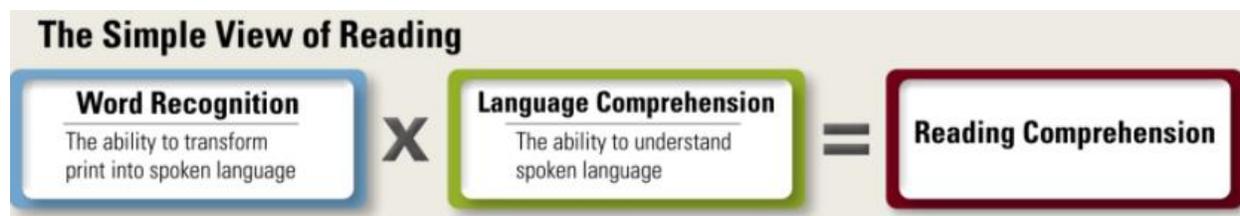


*Note.* Figure from *Ohio’s Plan to Raise Literacy Achievement* (ODE, 2020a, p. 21).

The plan also bases its literacy goal around the *Simple View of Reading* theory (Gough & Tunmer, 1986). Figure 2 demonstrates the idea that both word recognition and language comprehension are needed for comprehension.

**Figure 2**

*The Simple View of Reading*



*Note. Figure from Ohio’s Plan to Raise Literacy Achievement (ODE, 2020a, p. 20).*

The comprehensive plan also mentions the “...alignment of Ohio’s literacy improvement efforts” to the aforementioned TGRG, Ohio’s learning standards, Ohio’s standards-aligned system of assessments, Ohio school report cards, the Ohio Improvement Process (reading achievement plans and local literacy plans), Ohio’s 16 regional state support teams, Ohio’s Step Up to Quality preschool program, and Ohio’s Dyslexia Pilot Project. Overall, *Ohio’s Plan to Raise Literacy Achievement* is intended to integrate all Ohio literacy initiatives into one comprehensive plan.

**Ohio’s Striving Readers Grant (SRG).** Under ESSA, a Striving Readers Comprehensive Literacy Program (SRCL) provides state funding for literacy grants to promote literacy from birth through Grade 12. In 2018, The U.S. Department of Education’s Striving Reader’s Initiative awarded Ohio \$35 million to be split among preschool, elementary, and high schools with the goal of providing high-quality comprehensive literacy instruction within the classroom (ODE, 2019a). Through the grant, teachers were providing ongoing professional development. Teachers were taught how to track student data and make data-driven decisions on reading instruction in the classroom. Teachers were also taught how to use data to provide students with Tier 2 and Tier 3 reading interventions. Furthermore, teachers were trained on how to successfully track students throughout the course of the grant to assess student gains in reading development. The Ohio SRG concluded at the end of the 2019-2020 school year.

**Ohio’s Comprehensive Literacy Grant (CLSD).** In 2019, Ohio “...was awarded \$42 million for a Comprehensive Literacy State Development Grant” that held model sites responsible for focusing on “...implementing practices consistent with *Ohio’s Plan to Raise Literacy Achievement*” (ODE, 2020c, para. 1). Similar to the SRG, CLSD supported professional development and data-driven literacy instruction. Based on *Ohio’s Plan to Raise Literacy Achievement*, CLSD schools were held accountable for implementing the Five Components of Reading (National Reading Panel, 2000) into cross-curricular instruction: phonemic awareness, phonics, fluency, vocabulary, and comprehension.

### **Five Components of Reading**

#### ***Phonemic Awareness***

Phonemic awareness is a constrained reading skill that requires direct instruction due to the need to remember the 44 phonemes in the English language (Fisher et al., 2016, p. 46). Phonemic awareness is usually manifested by the oral pronunciation of the letters and words. According to Fisher et al., “...the mastery of the constrained skills of the sound and letters of the language are foundational, as is the ability to increasingly consolidate this knowledge to accurately and smoothly decode running text” (p. 46). Phonemic instruction is needed in order to allow students to develop baseline knowledge for reading.

#### ***Phonics***

Phonics is the relationship between sounds when letters are placed together. Although closely related to phonemic awareness, phonics centers on teaching symbol-sound relationships (Devries, 2019, p. 113). Students learn to look at a single letter, or letter combinations, and recognize the related sounds. Recognizing letter and sound combinations can help students to sound out unfamiliar words.

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### *Fluency*

Reading fluency takes place when students are able to read with expression. Fluent readers are “...able to enhance textual meaning” (Paige et al., 2012, p. 67). Although fluency is often thought of as oral expression when reading, research suggests that fluency also takes place when reading silently. According to Paige et al., “...instruction in fluency, whether in oral or silent reading, will impact oral and silent reading comprehension” (p. 68). Fluent readers can begin to recognize words, or groups of words faster, which allows for text comprehension.

### *Vocabulary*

Vocabulary allows students to build on content level terminology and improve comprehension of the material. Vocabulary can be added to the class curriculum along with other reading interventions such as fluency techniques. Because content level vocabulary can differ, studying “...word families, prefixes, suffixes, word roots, vocabulary journals, and word sorts” (Blachowicz & Fisher, 2002, as cited in Fisher et al., 2002, p. 72) can provide students with consistency across subjects. Students begin to see commonalities across subject areas and can use their knowledge along with context clues to make meaning from the text.

### *Comprehension*

Reading comprehension is the “Application and integration of strategies to sustain and make meaning over longer pieces of text” (Fisher et al., 2016, p. 45). Possessing word recognition and language comprehension allow for a deeper understanding of text and transference of knowledge across content areas.

### **Elementary Literacy Interventions**

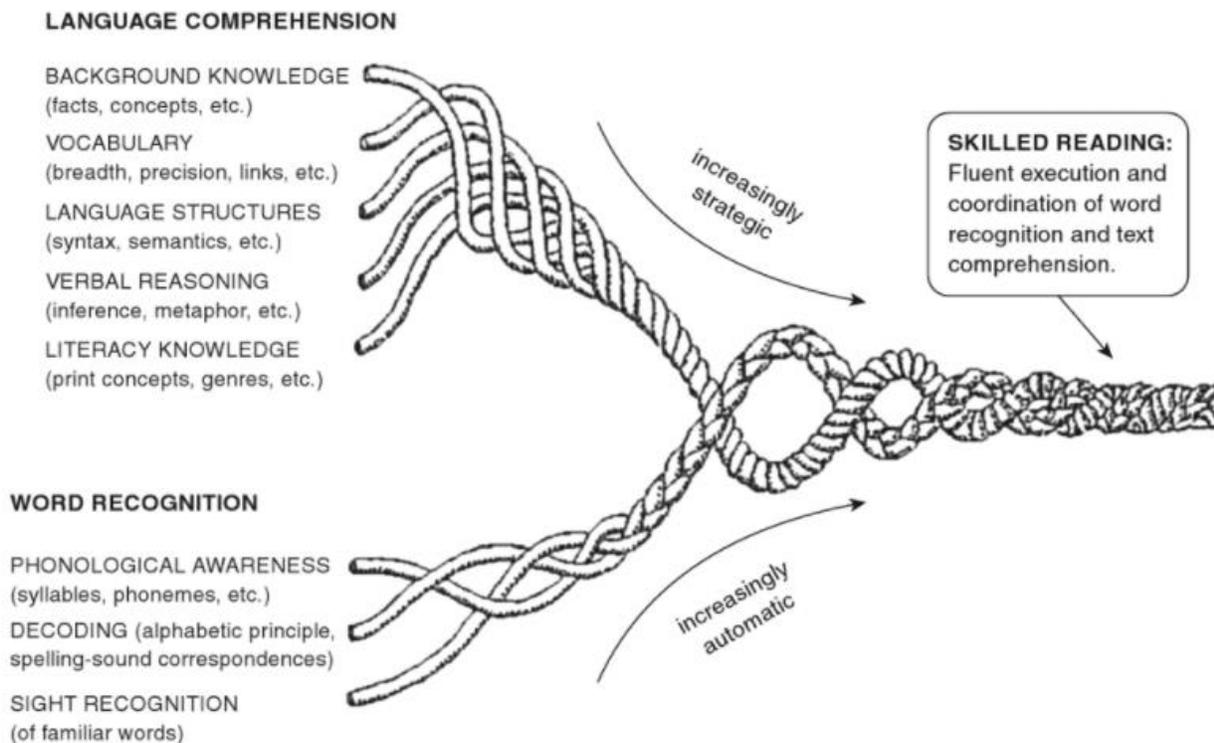
Emergent reading is the first step to literacy, where children begin to develop literacy before obtaining an education. During emergent literacy, children develop phonological

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processing, print awareness, and oral language, and grow to be more successful readers if brought up in an environment with exposure to literacy (Rohde, 2015). Following emergent literacy, early language and literacy focus on “complex skills that focus on decoding, recognition of words, and language comprehension” (ODE, 2020a, p. 25). Scarborough (2011) discussed the idea that early readers tend to struggle with word recognition strands (Figure 3).

**Figure 3**

*Scarborough’s Reading Rope (1998)*



*Note.* Demonstrates “the major ‘strands’ that are woven together during the course of becoming a skilled reader” (Scarborough, 2001, p. 23).

Therefore, in early elementary grades, explicit literacy instruction regarding phonological awareness, decoding, and sight recognition are taught to students using a variety of teaching strategies. After the word-recognition, students can begin to understand language

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comprehension. Elementary and high school strategies focused on in this literature review will correlate with the Five Components of Reading. Throughout all strategy implementation, it is important to consider that reading is a multidimensional process involving students who have “...unique cultural practices, cognitive strengths, and literacy experiences” (Compton-Lilly et al., 2020, p. S192); therefore, all strategies should be tailored to individual student needs.

### ***Phonemic Awareness***

According to Devries (2019), “...young readers learn new words by analyzing onset and rime than by attempting to make letter-phoneme correspondences” (p. 114). Therefore, students learn how to decode unfamiliar words as they begin to recognize the combination of letter sounds. Students can also add onsets to words as they begin to make sound and letter connections (p. 114). Explicit instruction and teacher modeling help students to understand the sounds of words. For example, the teacher reads the words to the students, and the students repeat what the teacher is asking. Assessing student progress during phonological awareness instruction can be done through the use of checklists. Checklists allow for differentiated instruction by “...allowing the teacher to identify a small group of students with the same needs” (Devries, p. 123). Examples of phonemic awareness skills consist of letter naming, rhyming (repetition, recognition, production), onset fluency (initial sound, dog /d/), blending words, isolating final sounds (truck /k/), segmenting words (bed-room), adding words (air- add/plane/-airplane), deleting words (classroom- say without/room/ -class), and substituting words (sunset-change to /rise/-sunrise) (Heggerty, 2020).

### ***Phonics Instruction***

Elementary phonics instruction further assists students with word decoding. Students can study phonics by breaking apart words by using onset-rime (looking at the initial phoneme of a

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word (b in bird) and the vowel and consonants that come after (-ird). Students can begin to understand how to break apart words by studying word families, studying the shapes of words, and completing word sorts. Sound-based word walls are effective phonetic instruction tools that involve displaying the words organized by sound and letter combinations (Dahlgren, 2020). Students are able to make connections between the letter and sound combinations embedded in the words.

### *Comprehension Interventions*

As students begin to decode words, they will begin to develop reading fluency. Reading fluency is important in that students do not stumble over words, but rather smoothly pronounce words with expression and understanding, ultimately leading to text comprehension (Landreth, 2018, p. 110). Oral reading provides fluency practice to students and can boost confidence levels as they make progress (p. 108). Teacher-modeling oral reading is effective because students are given the ability to learn fluency through teacher modeling and can repeat back excerpts or take turns reading with the teacher. Teacher modeling can take place through interactive reading with picture books. During interactive read-alouds, "... teachers read the text, model their thinking aloud, highlight strategy use, engage students in guided practice, and support learning as students share their own thinking and understanding in whole-class conversations" (McClure & Fullerton, 2017, as cited in Sun, 2020, p. 509). Interactive read-aloud helps emergent readers to acquire new vocabulary terms and practice reading comprehension strategies such as summarizing, predicting, and inferring (p. 516).

Furthermore, reciprocal teaching is a reading strategy that combines multiple reading strategies (including oral reading and vocabulary instruction) and offers a student-centered approach to reading comprehension. Reciprocal teaching involves students working in groups

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and reading a text paragraph by paragraph to create questions, understand complex words or areas of the text, summarize material, and make predictions (Alfassi, 2004, p. 172). According to Fisher et al. (2002), reciprocal teaching is successful in mainstream classrooms because the strategy challenges students to work together to find deeper meaning within a passage (p. 71). Reciprocal teaching is also comparable to the literacy strategy of literature circles, where each student is assigned a specific role and collaborates with group members to comprehend, question, and create deeper meaning from texts.

Vocabulary-teaching interventions are integrated into the elementary curriculum throughout the course of reading instruction, where the teacher explicitly instructs students on new vocabulary words through vocabulary previewing. When introducing words to younger students, Beck et al. (2013) suggested “...contextualizing a word for its role in the story”, then developing a student-friendly definition” that is easily relatable to students (p. 65). Regardless of which vocabulary strategy is chosen, new vocabulary terms should be explicitly instructed, then used throughout the unit so that students can retain learned knowledge.

### **High School Literacy Interventions**

Literacy interventions and instruction should continue at the high school level so that students can retain and expand on surface-level knowledge while progressing to deeper learning acquisition and knowledge transfer (Fisher et al., 2016). Differentiating instruction based on student needs can help strengthen fluency and reading comprehension for struggling readers. Differentiation can also help strong readers transfer learned knowledge into the creation of project-based learning (PBL) projects or extended writing pieces. Furthermore, students who obtain surface-level content literacy can comprehend disciplinary literacy practices within, and eventually across, each subject area. The aforementioned elementary literacy strategies can be

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easily tailored to fit the specific needs of students at the high school level to promote comprehension and engagement.

### ***Vocabulary Interventions***

Vocabulary instruction at the high school level helps students to build background knowledge to assist in understanding classroom content (Marzano, 2004). When students see the relevance of vocabulary words in their lessons and practice with vocabulary words more than once, students can begin to understand the meaning. Allen (2007) stated that when tools for teaching vocabulary “...are used appropriately by matching the instructional strategy with the goal, teachers discover that not only does comprehension increase, but also academic writing is more precise, logical, and interesting” (p. 6). Therefore, surface level, explicit vocabulary interventions should somehow be embedded in the classroom content.

Because there are numerous words in the English language, teachers can begin to choose vocabulary words to focus on by thinking about a three-tier framework. Tier one words consist of common words used in everyday occurrences (*plane, cold, cat*); tier two words consist of words that are used by “...mature language users and are found across a variety of domains” (*solidify, subtle, acquaint*); and tier three words are words that are used within a specific context or discipline (*micrometer, neutron, affidavit*) (Beck et al., 2013, p. 9). Research shows that focusing instruction on tier two words is the most effective due to the infrequency of hearing those in proportion to one tier words and is used across multiple domains (p. 9). However, tier three instruction is an example of disciplinary literacy that can help comprehension of specific content.

Research demonstrates that previewing vocabulary with students by the form of explicit instruction assists students in pronunciation and understanding of the words. Archer and Hughes

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(2011) demonstrated an explicit vocabulary routine in which the vocabulary word is introduced by the instructor (word, part of speech, definition, synonym, definition). Then, students repeat the word and answer a posed question about the word in order to make a real-world connection.

Research shows that students who are explicitly taught vocabulary words, then receive vocabulary “...instruction that goes beyond definitional information” and “...presents follow-up activities around the words” can increase comprehension and lead to deeper-level thinking (Beck et al., 2013, p. 83). High school interventions that encourage deeper level vocabulary instruction are vast. Some examples of vocabulary interventions involve using vocabulary words in writing or projects, providing examples and non-examples of the words, generating situations, contexts, and examples where the words are applied to real-life occurrences, and word journals. Although there are a wide variety of vocabulary interventions for deeper-level thinking, vocabulary that is explicitly taught and implemented into classroom content can lead to improved reading comprehension at the high school level. Beck et al. stated, “The need for multiple uses becomes even more critical at the upper grades because the words are more sophisticated and thus more multidimensional;” (p. 102). Therefore, using more than one vocabulary intervention at the high school level further promotes reading comprehension.

### ***Morphology Interventions***

Morphology interventions can assist students in breaking down words and making meaning from smaller parts. Morphemes contribute to reading comprehension because students can use them to manipulate words (morphological awareness) or to infer the meaning of words (morphological awareness) (Levesque, 2019). Morphology interventions at the secondary level involves teachers explicitly instructing students on a variety of prefixes and suffixes. Teachers orally state the prefix or the suffix to students and have the students repeat. Then, teachers

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explain the meaning of the morpheme and explain how the morpheme can contribute to the overall meaning of a base word. Finally, deep processing activities take place where students are required to use morphemes in writing or projects, connect morphemes to base words, generate situational contexts where morphemes could be added or taken away from base words, or complete word journals. Deep-level processing activities can help students to retain the meaning of morphemes and use morphemes for comprehension access disciplines.

### *Teacher Modeling*

Currently, research points to an increased focus on reading comprehension in secondary schools and less focus on phonics and oral reading fluency. Throughout

...the past decade, students have been given an increasing responsibility to learn more difficult content at a faster pace to meet state standards and pass outcome tests, because our educational system expects students of that age to be able to decode and comprehend material with challenging content fluently. (Powell & Gadke, 2018, p. 1276)

However, an increase in fluency can allow more cognitive resources to be used to focus on word meaning and text comprehension (p. 1275).

Similar to elementary fluency strategies, teacher modeling can help high school students to improve reading fluency. Research suggests that teacher modeling creates “...less anxiety and a [formation of] automaticity [that begins] to develop due to the model from the teacher or peer” (Swain et al., 2017, p. 106). Interactive read-alouds are used at the elementary level but can also be used at the high school level to engage students with the text and model comprehension strategies. In addition to whole-class interactive read-alouds, teachers can group students with similar literacy levels and have them participate in literature circles or book clubs. With similar

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leveled peers, students can read short excerpts out loud and/ or have small group discussions regarding the assigned text.

### ***Differentiated Literacy Instruction***

Furthermore, monitoring student reading fluency and comprehension can assist teachers in making data-driven decisions when differentiating instruction. Evaluating student fluency can provide “...diagnostic information about students and assist in progress monitoring and “...measuring end-of-year outcome” (Swain et al., 2017, p. 106). Effective differentiated literacy instruction provides students with the opportunity to be exposed to texts at their independent literacy levels to provide “...instruction to develop decoding skills necessary to read independently” (Hastings, 2016, p. 65). Instruction should also engage students “...with challenging [texts] appropriate to their age and cognitive level” (p. 65). Providing students with an anchor text and differentiating supplementary readings that share a similar theme can assist students in reading comprehension. Furthermore, when grouping students, they should be grouped by their “...phase of learning” and with “...those +1 above” to promote peer support” (Hattie, 2012, p. 110). Therefore, all students can grow decoding skills and be appropriately challenged.

Explicit and implicit reading differentiated literacy comprehension instruction can take place during literature circles and book clubs. Literature circles promote text variation, where each student is assigned a specific role and collaborates with group members to comprehend, question, and create deeper meaning from texts. Student groups can be differentiated by using student-benchmarking data for reading performance and student AIR assessment scores as baseline data for grouping students. During literature circles, students are held accountable for the literature circle’s roles. Examples of literature circle roles are discussion director, art director,

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word wizard, passage master, character captain, and summary supervisor (Ragland et al., 2017, p. 37); however, roles can vary based on student needs. In tandem, book clubs involve students with similar reading levels both reading and critically thinking about assigned texts or text sets. Both aforementioned interventions can vary according to student needs, and promote reading comprehension because of text differentiation, vocabulary integration, and strategic action usage.

### ***Strategic Actions***

Fountas' and Pinnell's (2017c) *Prompting Guide Part 2, for Comprehension: Thinking, Talking, Writing* provides "...language for teaching, prompting, and reinforcing effective reading behaviors during oral reading and in early writing" and "...language for teaching readers how to focus or expand their thinking through talk and writing before, during, and after reading" (p. 2). Encouraging students to think strategically about a text by using a system of strategic actions as explained in Figure 4 can assist in overall text comprehension. Strategic actions can take place during interactive read alouds, literature circles or book clubs, and independent reading.

**Figure 4**

*Fountas’ and Pinnell’s (2015) Systems of Strategic Actions*

Thinking <i>Within</i> the Text	Thinking <i>Beyond</i> the Text	Thinking <i>About</i> the Text
<ul style="list-style-type: none"> <li>● Searching for and using information</li> <li>● Monitoring and self-correcting</li> <li>● Solving words</li> <li>● Maintaining fluency</li> <li>● Adjusting</li> <li>● Summarizing</li> </ul>	<ul style="list-style-type: none"> <li>● Inferring</li> <li>● Synthesizing</li> <li>● Making Connections</li> <li>● Predicting</li> </ul>	<ul style="list-style-type: none"> <li>● Critiquing</li> <li>● Analyzing</li> </ul>

*Note.* Strategic Actions can be used throughout the reading comprehension process.

***Independent Reading***

Independent reading is an intervention that allows students to choose their own books to read for an extended period of time. Research demonstrates that independent reading can help to address “...issues of social equality and opportunity” (Wilhelm, 2016, p. 38) because students can choose books that are culturally and personally important to them (Brunow, 2016, p. 64). Regardless of text level, students who are actively reading books are using cognitive strategies for reading comprehension and critical thinking. Student choice integrated into classroom curriculum can create “...developing lifelong readers who take joy and great transformative benefit from their reading” (Wilhelm, p. 38).

***Fountas’ and Pinnell’s Leveled Learning Literacy Supplemental Instruction (LLI)***

LLI was originally intended for elementary grade levels but now services K-12 Grades (Gonzalez et al., 2018, p. 1). The process of LLI involves teachers “... assessing students using a one-on-one assessment that matches students’ instructional and independent reading abilities” to

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a text gradient (p. 1). Then, small groups “...of three to five students with similar assessment scores” are formed and provided “... 30 to 45-minute daily lessons” (p. 1). Using LLI in a high school setting raises challenges in that LLI instructors may not receive proper training. Also, scheduling time for supplemental LLI may be difficult due to the rigidity of high school schedules. Furthermore, provided LLI reading content may seem too elementary to some high school students. Nonetheless, proper implementation of LLI can help struggling readers to grow. LLI provides students with a small group setting in order to practice reading fluency, writing, and vocabulary. Discussion regarding LLI books encourages critical thinking and text to real-world connections.

### **Issue of Secondary Literacy Instruction**

According to Powell and Gadke (2018), “Becoming a successful reader involves a number of different skills, including phonemic awareness, decoding vocabulary, and comprehending text” (p. 1275). However, at the high school level, phonemic awareness and oral reading fluency are often overlooked in lieu of reading comprehension (p. 1276). Research validates that some secondary teachers are skeptical about literacy interventions and feel that teaching reading strategies take away from instructional time (Moje, 2008, p. 98). Teachers feel “...pressure to cover content in preparation for state standardized tests” (Ness, 2016, p. 59). Furthermore, many administrators and teachers feel that providing students with explicit reading instruction at the high school level is unnecessary (Ness, 2007, p. 61). Students who cannot decode words are unable to fully comprehend texts, leading to “...negative outcomes such as decreased educational attainment and decreased employment opportunities (Schreder et al., 2012). Therefore, literacy interventions cannot stop after the fifth grade.

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When students learn to comprehend texts and are taught multiple “...comprehension strategies such as predicting, questioning, and summarizing” standardized test scores improve (Ness, 2007, p. 229). Providing a variety of reading comprehension strategies and interventions to students can start with strategic professional development plans tailored towards literacy instruction (Fisher et al., 2002, p. 71). Teachers should be exposed to relevant professional development and have time to collaborate and reflect on the integration of literacy interventions in their classrooms. Therefore, both administrators and teachers will begin to see student growth and understand the positive impacts of literacy across content areas (Ness, 2007, p. 231).

For example, at Herbert Hoover High School in San Diego, California, secondary teachers were taught seven different reading interventions (read-aloud, K-W-L charts, graphic organizers, vocabulary instruction, writing to learn, structured note-taking, and reciprocal teaching) through ongoing professional development. They were also given time for reflection and literacy coaching and expected to use the seven strategies with administrative support. After three years of implementing school-wide interventions, reading achievement scores “...increased from an average 5.9 grade-level equivalent to an average 8.2 grade-level equivalent” (Fisher et al., 2002, p. 70). Herbert Hoover High School demonstrated that “... secondary teachers can help students become proficient readers of academic texts if they arm them with a variety of comprehension strategies” (Ness, 2007, p. 229). However, high school teachers feel insecure about teaching reading due to a lack of professional training.

Providing meaningful training on impactful reading strategies can help teachers of all subject areas to become more confident in using reading comprehension interventions in their secondary classrooms. Teachers need ongoing support to implement reading “... strategies [that] are beneficial for students’ understanding and retention of content”(Ness, 2016, p. 77). High

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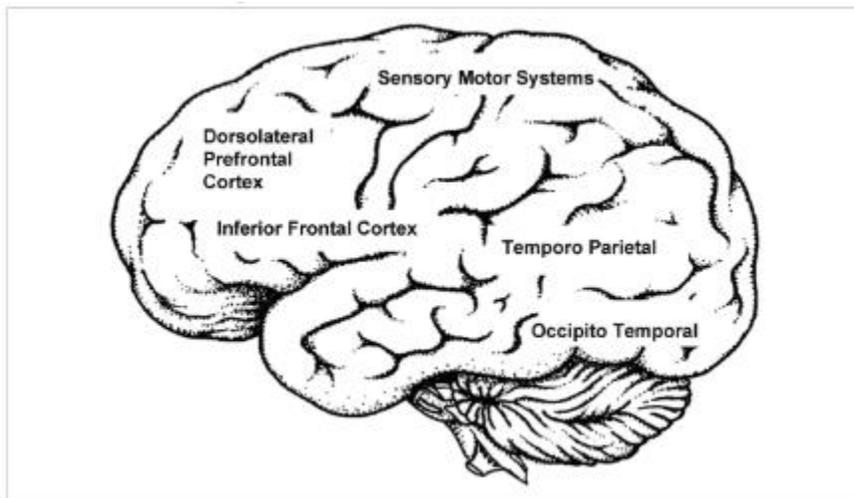
school organizations should encourage growth mindsets and ensure that data-driven professional development is provided to promote successful high school reading instruction across the curriculum.

### Reading Neuroscience

Research on the reading brain is limited due to the recent development of advanced brain scan technology. However, “...emerging accounts point to the multidimensional nature of reading” (Compton-Lily, 2020, p. S189). Figure 5 demonstrates certain areas of the brain activated when reading.

#### Figure 5

##### *Brain Areas Relevant to Reading*



*Note.* The left occipitotemporal cortex, the temporoparietal cortex, and the dorsal part of the inferior frontal cortex are associated with phonological analysis and decoding, while sensory-motor systems are activated by a person’s experiences and can impact the reading process (p. S190).

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According to Compton-Lily (2020) “...neuroscience has revealed that reading processes appear to involve bidirectional interactions within neural networks and information transfer across brain regions” (S191). Extensive transfer of information throughout the brain demonstrates the complexity of the reading process. Students use prior knowledge and experiences to process information creating varying reading experiences based “...social, cultural, and experiential contexts” (S192). Moreover, cortical network usage may vary as students mature and advance, gain new life experiences and increase exposure to texts and reading strategies (Meyler, 2007, p. 2786). Therefore, schools cannot fail to recognize “...the multidimensional and individualized nature of reading” (Compton-Lily, p. S187).

Emergent literacy begins at birth when children cannot technically read and write but are exposed to the language and social climates. Whitehurst (1998) defined emergent literacy “...as a developmental continuum” that starts in early childhood, “...rather than an all-or-none phenomenon that begins when children start school” (p. 848). Consequently, language exposure in the emergent stage impacts both brain and language development (Romeo et al., 2018). Lack of language exposure can cause students to struggle with “...linguistic skills, cognitive abilities, and academic achievement” (p. 700). Unfortunately, SES is a large contributor to language development (children from lower SES backgrounds tend to know fewer words); therefore, all parents should be taught how to effectively communicate with and expose children to language (p.701).

Furthermore, the culture of a community and family home can impact a child’s exposure to literacy. Rohde (2015), defined community as “...surrounding neighborhoods and the decisions made by local boards and organizations, such as the provision of toddler story hours at the library or access to [literacy] programs” (p. 7). Because “...preschool cognitive and

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behavioral functioning is highly predictive of literacy in young adulthood” (Baydar et al., 1993, p. 815), exposure to language before preschool is imperative for brain development and functioning. Preschool teachers familiar with emergent literacy can provide support or interventions to increase the literacy functioning of young children, which can support the transition to elementary school.

As children develop, neural functioning varies based on age level and skill (Meyler, 2007). Adolescent students begin to change cognitively, behaviorally, and socially as they begin to mature and partake in new experiences (Baydar et al., 1993, p. 816). Romeo (2013) referred to adolescence as “...a significant period of continued neural maturation” and “stress responsiveness” (p. 144) due to a slower “...hormonal response mediated by the hypothalamic-pituitary-adrenal (HPA)” (p. 140). Continual brain development and increased stress response in adolescence further demonstrate the importance of tailoring lessons to student abilities and interests in order to maintain engagement, confidence, and academic achievement. Overall, the complexities of the human brain illustrate the multifaceted nature of literacy instruction. Similar to the brain, humans are complex; therefore, reading instruction should be ongoing throughout high school and be treated as a complex process, not a scripted curriculum.

### **Motivational Impact of Reading Intervention**

Struggling adolescent readers may lack confidence and motivation when exposed to challenging texts. When studying functional illiteracy, Vágvölgyi et al. (2016) noted high dropout rates associated with “...increased avoidance of reading difficult materials” (p. 6). Furthermore, struggling students exposed to appropriately leveled texts may lack engagement in the content, leading to limited “...engagement and overall desire to go beyond thinking about more than the surface level of texts” (Abodeeb-Gentile & Zawilinski, 2013, p. 35). Therefore,

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providing “...multiple ways to engage students in a wide variety of texts” allows for a combination of leveled instruction and student agency in the classroom (p. 42).

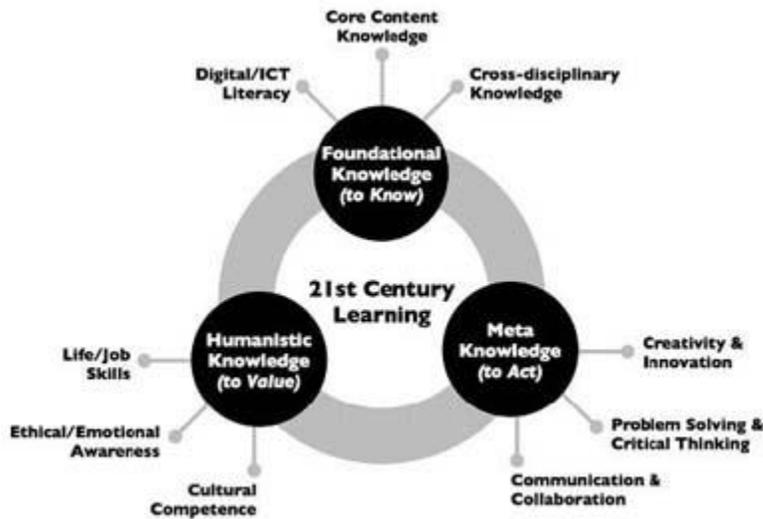
Providing reading intervention to students without explanation, and constantly assigning students instructional-leveled texts may lower student morale. Abodeeb-Gentile & Zawilinski (2013), stated that “...students who are consistently positioned in particular ways, i.e. as levels, take up identities that suggest they are a particular kind of student” (p. 36). In addition, students lacking exposure to challenging texts risk building vocabulary and developing comprehension strategies (Lupo et al., 2018). However, transparent communication between students and teachers can create a classroom culture where students have agency over what they are reading and understand the rationale behind scaffolding and intervention techniques. Providing students with support in reading a multitude of engaging texts creates a feeling of self-efficacy; students can independently read texts at their level but are motivated to comprehend more difficult texts with teacher support (Lupo et al.). Overall, creating a positive classroom environment that values student choice, diverse texts, and rationale behind interventions leads to buy-in, and can cause “...students’ confidence [to] grow as...they begin to see themselves as readers” (Landreth, 2018, p. 110).

### **Digital Literacy**

Twenty-first century learning involves the integration of technology into the curriculum as demonstrated in Figure 6. Students who are digitally literate have the “...ability to effectively and thoughtfully evaluate, navigate, and construct information using a range of digital technologies and thus to function fluently in a digital world” (Kereluik et al., 2013, p. 130).

**Figure 6**

*21st-century Learning Frameworks*



*Note.* This figure combines 15, 21st-century learning frameworks into one image. Kereluik et al. (2015) examined numerous reports on the meaning of 21st-century teaching. Obvious differences from the 20th-century teaching include technological modernization (technology integrated into all areas of life) and globalization (interconnected and diverse global society) (p. 129).

Technology allows students to access a multitude of diverse texts and literacy comprehension software programs. Furthermore, technology has evolved “...methods and techniques of acquiring, representing, and manipulating knowledge in almost all disciplines” (Kereluik et al., 2013, p. 132). Therefore, teachers should be effectively trained on technology in order to provide students with the ability to discover, create, communicate, and acquire credible information across content (Yurtseven Avci et al., 2020). Overall, many reading interventions in the 21st-century are similar to those used in the past and can be molded to modern technology to fit students' individualized learning needs. According to Amgott (2018), “Designing instruction that cuts across critical literacy... and digital literacy encourages students to question multiple

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viewpoints and promote social justice widely within and beyond... classrooms” (p. 339). Re-conceptualizing traditional teaching methods by the use of technology supports diverse learners and promotes real-world learning.

Literacy interventions can take place in digital formats across content areas. Creating a flipped classroom is a blended learning model where students learn the content at home in the form of lectures, videos, notes, etc., and apply learned content during class. Flipped classrooms allow instructors to focus on differentiated instruction and creates time for students to ask questions and have discussions during class. Furthermore, learning management systems (LMS) such as Google Classroom creates easy access to assignments and reference materials, and allows students to collaborate and progress monitor. Additionally, search engines, social media, and software programs provide a multitude of resources to supplement assignments and support PBL projects.

Moreover, science, technology, engineering, and mathematics (STEM) education in 21st-century classrooms is “...stated as being essential to the financial, economic, and societal health of a country, and in securing a productive future for its people” (Redman, 2017, p. 320). Redman noted STEM students become “...skilled problem-solvers, flexible thinkers, collaborative and creative, persistent, productive, and precise in their practices” (p. 319). Integrating STEM education into the high school curriculum creates authentic experiences for students where disciplinary literacy relates to real-world experiences. Creating experiences for students to partake in STEM-based projects supports the real-world application of relevant content hence generating student engagement. Students will persist in working through tough content material if they understand how it applies in accomplishing an authentic end goal (Meece et al., 2006).

### **Cross-Content Literacy Instruction**

Because “...cross-disciplinary knowledge and the ability to synthesize information are... different in the 21st-century than in the past” (Kereluik et al., 2013, p. 132), cross-content literacy integration is essential to overall student achievement. Technology exposes students to an influx of information on various topics and teachers working collaboratively can teach students how to synthesize and apply information across disciplines. Successful cross-content literacy instruction is most effective in a collaborative school culture where “...teachers share strong educational values, work together to pursue professional development... [and] are committed to improving their work” (Gruenert & Whitaker, 2015, p. 50). In a cross-content teaching environment, “...discussions focus on student achievement... and [teachers] spend time observing each other to critically analyze teaching methods” (p. 51). Effective leadership creates a collaborative environment, which ultimately trickles down to student achievement.

Unfortunately, “...the division of secondary school learning into subject areas drawn from the disciplines reifies a belief (and constructs sets of practices) that implies [*sic*] knowledge is inherently different in different disciplines” (Moje, 2008, p. 99). Teachers may argue that literacy conventions are the responsibility of the English teacher. English teachers may argue that “...reading and writing in other disciplines” are not their area of expertise (p. 98). However, the evolution of technology has bridged the gap between separate disciplines; literacy is interdisciplinary and should be integrated into every classroom regardless of the subject.

Globalization has increased the importance of cultural competence in the classroom. Students are taught how to effectively communicate, collaborate, and appreciate “...ideas and emotions of all types of individuals” (Kereluik et al., 2013, p. 131). Hence, high school leaders should work to create environments among staff where “[i]ndividuals get confidence, learning,

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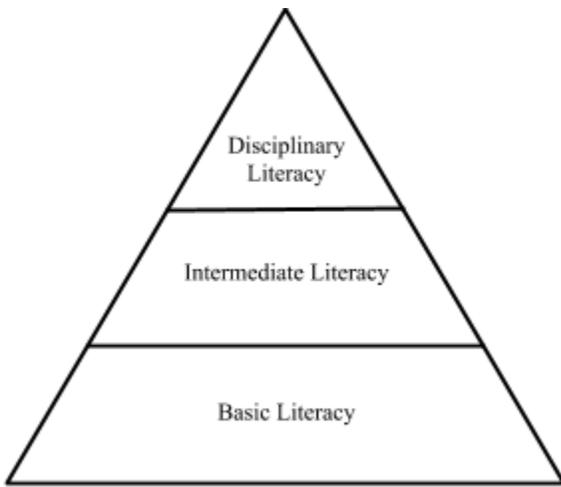
and feedback from having the right kind of people and the right kind of interactions and relationships around them” (Hargreaves & Fullan, 2012, p. 4). Teachers enforcing cultural competencies should avoid a generalizable curriculum, and this starts with cross-curricular literacy instruction (Shanahan & Shanahan, 2012). Content literacy perspectives have shifted “...from understanding literacy as a collection of general skills that can be applied to any discipline, to viewing literacy as an integral part of content learning within the discipline” (Adams & Pegg, 2012, p. 152). Students acquiring content literacy knowledge can apply comprehension skills to further understand specifics within each discipline.

First, organizations that strive for teacher collaboration and promote cross-content literacy can establish an environment where both content and disciplinary literacy instruction is supported. Moje (2008) called for the restructuring of school schedules, where teachers are not isolated in a single classroom throughout the day. When teachers have the opportunity to co-teach and common plan, teachers begin to understand all disciplines and develop a teamwork approach to literacy instruction. Furthermore, ongoing, data-driven professional development can be provided to teachers to support literacy instruction. In addition, professional development can take place on the form of individual or whole-group instruction and can be data-driven. Ongoing training that focuses on content and disciplinary literacy instruction and interventions can equip teachers to promote student literacy growth within their organizations.

Shanahan and Shanahan (2008) discussed literacy development (Figure 7), demonstrating the pathway students take to become critical readers across disciplines.

**Figure 7**

*The Increasing Specialization of Literacy Development*



*Note.* Basic literacy involves students acquiring phonological awareness and decoding skills. Intermediate literacy involves “...generic comprehension strategies, common word meanings, and basic fluency”, and disciplinary literacy involves “...skills specialized to history, science, mathematics, literature, or other subject matter” (p. 44).

Figure 7 clarifies the importance of obtaining basic knowledge and content literacy skills to further disciplinary literacy comprehension. Content literacy acquisition supports disciplinary literacy instruction (Adams & Pegg, 2013) so both content literacy and disciplinary interventions can be used across the curriculum. For example, teachers can use common content literacy interventions across the curriculum to support the acquisition of mastery in grade-level text comprehension and vocabulary usage and to teach students basic literacy comprehension strategies. However, teachers can also focus on disciplinary literacy by providing students with “...the specialized tools to construct and analyze vocabulary” and texts regarding specific domains (Shanahan & Shanahan, 2012, p. 9). Cross-curricular instruction can expose students to familiar reading comprehension strategies across the curriculum (content literacy), as well as

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challenge students to think critically about disciplinary texts (disciplinary literacy). In addition, pairing instruction alongside “...students’ cultural backgrounds, prior knowledge, decoding abilities” and comprehension skills (Compton-Lilly, 2020, pp. S188-S189) can engage and motivate students.

Communication and collaboration among staff can provide impactful, cross-curricular literacy instruction. English teachers or literacy coaches can benchmark student reading levels and share with all teachers with the organization. Teachers can share student concerns and collaborate accordingly to fit the needs of each student. Furthermore, teachers can collaborate on PBL projects by integrating disciplinary literacy elements from each subject area to form a final product. Shanahan and Shanahan (2012) stated that “...disciplinary differences in literacy exist because of differences in the disciplines themselves” (p. 12); however, when students begin to see teachers supporting one another in instruction, they will begin to view literacy as a relevant component to achievement.

### **Summary**

Literacy is a vital component of academic achievement and success after high school. Low standardized literacy scores across the nation and in the state of Ohio have invoked public policies in an attempt to raise literacy achievement. Students need basic phonological awareness, decoding, and fluency skills in order to comprehend texts. Assumptions that high school students have the ability to decode and read fluently inhibit student growth and create struggling students who lack the motivation to succeed. However, the use of literacy interventions and explicit literacy instruction at the high school level is uncommon due to pressures of covering standardized test content and content remaining exclusive to each subject area (Moje, 2008, p.

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99). Teachers lack support in literacy instruction and should be receiving ongoing professional development, common planning time, and quality instructional materials.

School is critical for child development; classroom environments can impact “...students’ academic engagement and achievement” as well as “...motivation... and self-perceptions” (Meece et al., 2006, p. 488). Literacy is an integral part of academic achievement and should be implemented across all curriculum areas in the form of content and disciplinary literacy instruction. Furthermore, 21st-century teaching calls for a globalized curriculum with technology integration. Student choice and exposure to a variety of texts and reading strategies can provide authenticity and agency within and beyond the high school classroom.

This mixed-methods study examines student literacy and academic growth across a one-to three-year time span when students are exposed to 21st-century literacy interventions across the curriculum in a STEM-based setting. This study also examines student and teacher perceptions of literacy interventions and instruction within the classroom, and within supplemental LLI groups.

Chapter 3

**Methods**

Research on the impact of 21st-century literacy interventions implemented at the high school level is necessary due to low literacy levels across the state of Ohio. Although an abundance of reading strategies exist, most are tailored towards elementary learners. Additionally, high school teachers are often uncomfortable implementing reading interventions into the curriculum due to lack of training and pressure to teach standardized testing content. The purpose of this mixed-methods research study was to examine the impact of 21st-century literacy interventions and supplemental LLI literacy instruction on high school student achievement. Moreover, this study examined high school students and teachers' perceptions of literacy interventions and instruction integrated into the curriculum.

This three-year, mixed-methods study investigated the impact of 21st-century literacy interventions on student achievement in a STEM high school. The researcher determined whether the use of vocabulary interventions, differentiated literacy instruction, and both Fountas' and Pinnell's SOSA and LLI impact student growth. In addition, the researcher determined student and teacher perceptions of reading interventions and instruction at the high school level. The focus of this study was whether high school literacy interventions impact student growth, as measured by Fountas' and Pinnell's *BAS 2* (2016). More explicitly:

1. What is the impact of personalized, 21st-century literacy interventions on student reading levels over the course of one academic year?
  - a. Is there a sustained impact of 21st-century literacy interventions on student reading levels when examined across three academic years?

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2. What are perceptions that high school students have in regard to literacy interventions and instruction received throughout their education?
3. What are perceptions that high school teachers have in regard to implementing 21st-century literacy interventions into their classrooms?

### **Participants**

This research investigation began during the 2018-2019 school year and concluded during the 2020-2021 school year. Participants were in an open enrollment, STEM-designated public school in Ohio. The school opened in 2016 and was designed for ninth- and 10th-grade students. Students throughout Ohio applied on a first-come, first-serve basis, with a lottery system implemented if enrollment exceeded capacity. As a result of open-enrollment, students arrived at the high school with varied academic and socioeconomic backgrounds.

The STEM high school used for this study is an organization that works hard to promote professional capital by employing open minded, collaborative individuals that care about students. Furthermore, this school provides ongoing professional development to staff in order to assist in the development of modernized, project-based learning lessons and cross-curricular instruction. The school promotes critical thinking skills, and partners with local, state, and national businesses to provide students' access to authentic audiences and real-world preparation.

Throughout the course of this study, the STEM school staff consisted of 10 instructors and two administrators. The school also had three paraprofessionals on staff who were LLI trained. Paraprofessionals assisted with supplemental LLI reading instruction and assisted teachers and intervention specialists with various instructional tasks. Administrators at the school promoted collaboration among the STEM staff and supported individualized professional learning and curriculum development. A 40-minute weekly or biweekly common plan was

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worked into the schedule to ensure teacher collaboration on cross-curricular lessons. Common plan also provided teachers with time to share learned knowledge relevant to student and organizational growth.

Participants in this study involved both teachers and students at the STEM school. Quantitative data gathered from this study involved students receiving whole class and supplemental reading intervention instruction. Table 1 demonstrates the demographics of the student body separated by gender for each year of the study.

**Table 1**

*Student Demographics- Gender*

School Year	Total	Males	Females
	#	%	%
2018-2019	38	52.63	47.37
2019-2020	215	55.81	44.19
2020-2021	209	66.99	33.01

*Note.* Data retrieved from Data and Analysis for School Leadership (DASL).

Additionally, Table 2 demonstrates further student body demographics separated by race for each year of the study.

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**Table 2**

*Student Demographics- Race*

School Year	Total	White	Black	Hispanic	Multi-Racial	American Indian	Asian
	#	%	%	%	%	%	
2018-2019	38	81.58	2.63	7.89	5.26	0.00	2.63
2019-2020	215	86.98	3.72	6.05	2.79	0.47	0.00
2020-2021	209	88.52	3.35	5.74	2.39	0.00	0.00

*Note.* Data retrieved from DASL.

Moreover, Table 3 shows additional student body demographics for each year of the study.

**Table 3**

*Student Demographics- Further Demographic Information*

School Year	Total	Free/Reduced Lunch	Disabilities	504 Plans	English language learners (ELL)
	#	%	%	%	%
2018-2019	38	52.63	13.16	13.16	2.63
2019-2020	215	48.37	23.72	8.37	0.47
2020-2021	209	43.54	21.53	10.05	0.00

*Note.* Data retrieved from DASL.

Qualitative interview data addressing student perceptions in regard to receiving literacy interventions and instruction involved student participants across three years of the study.

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Interview data regarding high school teacher perceptions in regard to implementing 21st-century literacy interventions and instruction into their classrooms involved high school STEM teachers.

### **Ohio's Striving Readers Grant (SRG)**

During the 2018-2019 school year, the STEM high school became part of a nationwide SRG initiative where "Ohio was awarded a \$35 million Striving Readers Comprehensive Literacy Grant from the U.S. Department of Education" (ODE, 2019a, para. 1). Funds were split among preschool, elementary, and high schools with the goal of providing high-quality comprehensive literacy instruction within the classroom. The STEM high school participated in the grant jointly through the local ESC consortium.

Throughout the course of the grant, teacher leaders from each core content area (English, science, history, and math) regularly attended professional development seminars at the local ESC to learn evidence-based practices and interventions in relation to student reading comprehension. Learned practices were implemented in the classrooms of the teacher leaders. Additionally, teacher leaders collaborated with administration and local ESC consultants to continually assess effectiveness of evidence-based practices in their particular classrooms. ESC consultants also came to the STEM high school to assist in the implementation of newly learned evidence-based reading practices, LLI group formation, and benchmarking data disaggregation. Furthermore, lead teachers provided professional development that focused on literacy interventions to other teachers within their subject area.

Finances received from the SRG have provided the STEM school the ability to implement evidence-based reading practices because of the ability to purchase differentiated literacy novels, explicit vocabulary intervention resources, LLI kits, *BAS 2* kits, and ongoing professional development. The STEM school effectively carried out the SRG to completion

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during the 2019-2020 school year. However, learned instructional practices and resources were used and expanded on throughout the course of this study.

### **Instrumentation**

Three levels of instrumentation were used throughout this study to determine student literacy scores. The first level of instrumentation was Ohio's EOC ELA AIR test. The AIR test analyzed interval levels of measurement by taking student scores and placing them in a scale score range that determines student performance levels of Limited, Basic, Proficient, Accelerated, or Advanced (ODE, 2018, p. 4). When determining Goodness-of-Fit for the ELA Content Model AIR tests administered in Spring 2019, the Comparative Fit Index and Tucker-Lewis Index values "...were all equal to or greater than 0.95", with Root Mean Square of Approximation being "...below .05 threshold" (Cambium Assessment & ODE, 2020, p. 12). Cambium Assessment and ODE (2020) also found the internal reliability of the ELA I and ELA II Fall 2019 AIR test to be between 0.84 and 0.87 (p. 39). Students performing at a proficient level or above were considered reading at or above grade level. Figure 8 demonstrates the numerical scores for each performance level according to grade and subject.

**Figure 8**

*Ohio’s EOC American Institutes for Research Test Scale Score Ranges in ELA*

<b>Grade/ Subject</b>	<b>Limited</b>	<b>Basic</b>	<b>Proficient</b>	<b>Accelerated</b>	<b>Advanced</b>
Grade 7	568-669	670-699	700-724	725-748	749-833
Grade 8	586-681	682-699	700-724	725-743	744-805
English language arts I	606-682	683-699	700-724	725-738	739-800
English language arts II	597-678	679-699	700-724	725-741	742-808

*Note.* ODE Performance Standards (2019b).

Second, the *Basic Reading Inventory* (Johns et al., 2017) is an informal, individually-administered diagnostic tool used to determine reading comprehension and reading accuracy. Estimated student reading levels consist of independent, instructional, and frustration. An example reading passage and scoring template from the *Basic Reading Inventory* can be found in Appendix B. Prior research has found the test-retest reliability of the *Basic Reading Inventory* to be between .81 to .93 (Bieber et al., 2015, p. 203) and alternate forms reliability to be between .84 and .96 (p. 204). Bieber et al. also reported a concurrent validity of the *Basic Reading Inventory* to be between .85 and .97 (p. 204).

Finally, the *Fountas & Pinnell BAS 2* is an individually-administered diagnostic tool used “...to observe, code, and analyze students’ reading behavior” in order to “...measure comprehension” (Klingbeil et al., 2015, p. 504). Students were scored from level L-Z; each level corresponded with an instructional grade level (third through eighth grade). The Fountas and Pinnell “Coding and Scoring Errors at-a-Glance” sheet can be found in Appendix C, an example of a *BAS 2* oral reading and comprehension conversation recording form can be found in Appendix D, and the Fountas and Pinnell “Key for Determining Reading Levels” (in Fountas &

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Pinnell, 2017, *Assessment Forms BAS 2*, p. 362), can be found in Appendix E. Prior research has found test-retest reliability of the Fountas' and Pinnell's BAS books to be .97 (Klingbeil et al., p. 2). When compared to Reading Recovery (an assessment program recognized by the U.S. Department of Education) convergent validity of the Fountas and Pinnell BAS has "correlations of .94 for fiction and .93 for nonfiction" texts (p. 2). Therefore, "After two and a half years of editorial development, field testing, and independent data analysis" the BAS system demonstrates "...both reliable and valid measures for assessing students' reading levels" (p. 2).

The first qualitative component of this study examined student responses to questions related to literacy interventions and instruction received throughout their education. Students were asked the following interview questions:

- How would you describe yourself as a reader?
- Has anyone positively or negatively influenced how you view yourself as a reader? If so, please tell me more about that.
- What is your earliest memory of learning how to read?
- How would you describe your reading experience in elementary school?
- How would you describe your reading experience in middle school?
- Talk about a time when you felt discouraged when reading or doing a reading activity/assignment.
- Was there ever a specific point in time when you felt that you gained more confidence in your reading abilities?
- How have you changed as a reader?
- Do you think that being able to read helps you to do better in all of your subjects in school? If so, please tell me more about that.

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- How can teachers help students become better, more confident readers?
- How do you feel when you receive reading assignments and/or reading instruction in your classes at this school?
- How do/ did you feel about LLI class?
  - How do/ did you feel about the books in LLI class?
  - Do you think that LLI class helped you to change as a reader?
  - Do you think that LLI class helped you to feel more confident in your reading abilities?
- Do you feel that reading currently is, or will be important in your life? If so, please tell me more about that.

The second qualitative component of this study examined teacher responses to questions regarding the implementation of 21st-century literacy interventions into high school classrooms.

Teachers were asked the following interview questions:

- What makes a teacher an effective literacy instructor?
- What are some ways that teachers can be supported with literacy instruction in the classroom?
- How comfortable do you feel with integrating reading instruction into your classroom (vocabulary, differentiated literacy instruction, etc.)?
- Do you think that students are learning more effectively because of receiving differentiated reading instruction across the curriculum?
- Do you think that the reading below grade level impacts a student's performance in classes? If so, please tell me more about that.

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- Do you think that the reading below grade level impacts a student's self-confidence? If so, please tell me more about that.
- Can you think of one specific student that grew as a result of literacy instruction at the high school level? If so, please tell me more about that.
- What sorts of reading strategies are you using in your classroom?
- Besides reading strategies, what are some other ways that you think a teacher can promote student literacy growth?
- Do you think that reading impacts a student's overall success?
- Do you think that implementing 21st-century literacy instruction into your classroom is taking away from your content and/ or EOC exam preparation?
- Do you feel that reading currently is, or will be important in your students' lives? If so, please tell me more about that.

### **Procedures**

This three-year study was conducted in three phases. Phase I took place during the 2018-2019 school year, Phase II took place during the 2019-2020 school year, and Phase III took place during the 2020-2021 school year.

#### ***Phase I***

The first phase of this study consisted of 38 students enrolled at the STEM high school. Student AIR test scores were examined, and benchmarking data were collected in the fall of the 2018-2019 school year. First, ninth-grade students' prior eighth-grade English AIR test scores were examined. Also, 10th-grade students' prior ninth-grade English AIR test scores were examined. Students who scored a 725 or above were considered reading at grade level. Students who received scores of 724 or below were assessed using the *Basic Reading Inventory*. The

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*Basic Reading Inventory* was administered by a certified LLI-trained English teacher or paraprofessional according to manufacturer specifications. Students who scored independent/instructional or independent on the *Basic Reading Inventory* on both the word recognition and comprehension portion of the assessment were considered reading at grade level. Students who scored instructional/ frustration or frustration in either the word recognition or comprehension section were then assessed using the *BAS 2*. The *BAS 2* was administered by a certified LLI-trained English teacher or paraprofessional according to manufacturer specifications. Results from the *BAS 2* determined instructional and hard student reading levels.

After the assessment, select students were placed in LLI supplemental classes based on reading levels. Four 42-minute LLI classes were administered four times per week, with a total of 20 students serviced. LLI instructors consisted of LLI-certified teachers and paraprofessionals. Both students receiving LLI, and students in the general education classroom, were instructed using 21st-century literacy interventions daily. Interventions consisted of vocabulary interventions, differentiated literacy instruction and Fountas' and Pinnell's SOSA. In the spring of the 2018-2019 school year, students who were initially benchmarked in the fall using the *BAS 2* were assessed for a second time to determine instructional level growth.

### ***Phase II***

The second phase of this study consisted of students enrolled at the STEM high school. During the fall of the 2018-2019 school year, all incoming ninth-grade students' prior eighth-grade English AIR test scores were examined. Also, new incoming 10th-grade students' prior ninth-grade English AIR test scores were examined. Students who scored a 715 or above were considered reading at grade level. Students who received scores of limited, basic, or proficient were assessed using the *Basic Reading Inventory*. The *Basic Reading Inventory* was

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administered by a certified LLI-trained English teacher or paraprofessional according to manufacturer specifications. Students who scored independent/ instructional or independent on the *Basic Reading Inventory* on both the word recognition and comprehension portion of the assessment were considered reading at grade level. All new, incoming students who scored instructional/ frustration or frustration in either the word recognition or comprehension section were then assessed using the *BAS 2*. Returning 10th-grade students assessed using the *BAS 2* during the 2019-2020 school year were reassessed to determine potential growth. The *BAS 2* was administered by a certified LLI-trained English teacher or paraprofessional according to manufacturer specifications. Results from the *BAS 2* determined instructional and hard student reading levels.

After the assessments, select students were placed in LLI supplemental classes based on reading levels. Three 42-minute LLI classes were administered four times per week, with a total of 15 students serviced. LLI instructors consisted of LLI-certified teachers and paraprofessionals. Both students receiving LLI, and students in the general education classroom, received instruction using 21st-century literacy interventions daily. Vocabulary interventions, differentiated literacy instruction, and Fountas' and Pinnell's SOSA were employed. Due to a delay, students who were initially assessed using the *BAS 2* were benchmarked for a second time in the fall 2020 to determine potential growth.

### ***Phase III***

The third phase of this study consisted of all students enrolled at the STEM high school. All incoming ninth-grade students, and any new incoming 10th-grade students were assessed using the *Basic Reading Inventory*. The *Basic Reading Inventory* was administered by a certified LLI-trained English teacher or paraprofessional according to manufacturer specifications.

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Students who scored independent/ instructional or independent on the *Basic Reading Inventory* on both the word recognition and comprehension portion of the assessment were considered reading at grade level. Students who scored instructional/ frustration or frustration in either the word recognition or comprehension section were then assessed using the *BAS 2*. Returning 10th-grade students assessed using the *BAS 2* during the 2019-2020 school year were reassessed to determine potential growth. The *BAS 2* was administered by a certified LLI-trained English teacher or paraprofessional according to manufacturer specifications. Results from the *BAS 2* determined instructional and hard student reading levels.

After the assessment, select students were placed in LLI supplemental classes based on reading levels. Two 42-minute LLI classes were administered two times per week, with a total of 10 students serviced. LLI instructors consisted of LLI-certified teachers and paraprofessionals. Both students receiving LLI and students in the general education classroom received instruction using 21st-century literacy interventions daily, consisting of vocabulary, differentiated literacy instruction, and Fountas' and Pinnell's SOSA. In the spring of the 2020-2021 school year, students who were initially benchmarked in the fall using the *BAS 2* were assessed for a second time to determine potential growth.

Qualitative data were collected during the spring of the 2020-2021 school year. A total of six students and four teachers were informed that they would be receiving an invitation to participate in approximately 15-to-30-minute in-person interviews with a third party individual. The individual interviewed each student and teacher using the aforementioned open-ended qualitative questions. The researcher intended to use the qualitative questions to inquire about student and teacher perceptions of 21st-century literacy interventions and instruction. The interviews were recorded with permission and transcribed. All teacher and student responses

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remained confidential, with no identifier information collected. Interview transcripts were shared with the researcher for synthesis with the quantitative data.

### **Data Analysis**

Initially, basic descriptive statistics were computed to provide a summary of the student participants. Additionally, quantitative data were examined by conducting a Pre-and Post-Dependent Sample *t*-Test using IBM SPSS Statistics software to determine average student reading level growth during each phase of the study. In addition, a Repeated Measures Analysis (GLM) was conducted, again using IBM SPSS Statistics software, to assess the longitudinal impact of reading interventions on student reading level growth. Qualitative responses were evaluated by coding responses for themes and trends, and interrater reliability estimates were analyzed.

### **Summary**

Overall, quantitative results of this study allowed the researcher to investigate the impact of 21st-century literacy interventions on student reading levels. Additionally, quantitative results provided a structure to evaluate the impacts of 21st-century literacy interventions on student reading levels individually and as an aggregate. Data analyses further allowed for the researcher to determine a potential correlation between 21st-century literacy interventions and an increase in student reading levels. The study results allowed teachers and administrators to learn about the effects of implementing 21st-century literacy interventions into the high school classroom. Qualitative interviews enabled students to discuss past and current experiences with and perceptions of reading instruction, as well as enabled teachers to discuss their experiences with and perceptions of incorporating literacy interventions into their high school classrooms. Both quantitative and qualitative data results can potentially influence future instructional design.

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Bringing this information to the forefront further demonstrates for incorporation of 21st-century literacy interventions at the high school level.

Chapter 4

**Results**

This current investigation examined the impact of 21st-century literacy interventions over the course of three academic years. Research evaluated how the use of 21st-century interventions impacted student reading levels as measured by *Fountas & Pinnell BAS 2* results. Specifically, the following research questions are addressed:

1. What is the impact of personalized, 21st-century literacy interventions on student reading levels over the course of one academic year?
  - a. Is there a sustained impact of 21st-century literacy interventions on student reading levels when examined across three academic years?
2. What are perceptions that high school students have in regard to literacy interventions and instruction received throughout their education?
3. What are perceptions that high school teachers have in regard to implementing 21st-century literacy interventions into their classrooms?

This chapter presents a discussion on the mixed-methods analysis that was conducted based on the research questions guiding the study. Quantitative results examined the impact of 21st-century literacy interventions on student reading levels as measured by *BAS 2* scores. Qualitative results examined both student and teacher perceptions in regard to 21st-century literacy interventions and instruction.

**Descriptive Statistics**

This mixed-methods study was conducted in three phases, with each phase representing a total of one academic school year. Phase I took place during the 2018-2019 school year, Phase II took place during the 2019-2020 school year, and Phase III took place during the 2020-2021

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school year. Phase I of the study included a total sample of 33 ninth-grade and five 10th-grade students out of 199 students in the STEM school. A total of 38 students were benchmarked using the *BAS 2* in fall 2018 and spring 2019 and taught using 21st-century literacy interventions throughout the academic year. Students by grade level for Phase I are demonstrated by Table 4.

**Table 4**

*Students by Grade Level for Phase I (2018-2019) School Year*

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Grade Level	Frequency	%
9	33	86.8
10	5	13.2

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As indicated above, there were 28 more ninth-grade students in the sample than 10th-grade students during Phase I of the study.

Table 5 provides a breakdown of students by grade level that participated in Phase II of the study during the 2019-2020 school year. A total of 71 ninth-grade students and 67 10th-grade students participated in the study. During Phase II of the study, students were benchmarked using the *BAS 2* in fall 2019 and fall 2020 and taught using 21st-century literacy interventions throughout the school year.

**Table 5**

*Students by Grade Level for Phase II (2019-2020) School Year*

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Grade Level	Frequency	%
9	71	51.4
10	67	48.6

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As indicated in Table 5, ninth-grade students in the sample exceeded the number of 10th-grade students by four students during Phase II of the study.

During Phase III of the study, students were taught using 21st-century literacy interventions and benchmarked using the *BAS 2* in fall 2020 and spring 2021. A total of 203 ninth- and 10th-grade students in the STEM school participated in the study. Table 6 provides a breakdown of students by grade level that participated in Phase III of the study during the 2020-2021 school year.

**Table 6**

*Students by Grade Level for Phase III (2020-2021) School Year*

Grade Level	Frequency	%
9	87	42.9
10	116	57.1

As shown in Table 6, 10th-grade students in the sample exceeded the number of ninth-grade students by 29 students during Phase III of the study.

### **Preliminary Analysis**

Throughout each phase of this mixed-methods study, quantitative data were collected and examined to determine individual student reading levels. During Phase I of the study, most recent Ohio EOC English AIR assessment data were collected and examined to determine if students were considered grade-level readers (Appendix G). Students who did not score a 725 or above on their most recent AIR test were assessed using the *Basic Reading Inventory* (John et al., 2017) to further assess whether students were reading at grade level. Table 7 demonstrates the

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amount of students reading at or below grade level based on *Basic Reading Inventory* results during Phase I of the study.

**Table 7**

*Basic Reading Inventory Scores for Phase I (2018-2019)*

18-19 School Year	Frequency	%
Grade Level Readers	16	42.1
Below Grade-Level Readers	22	57.9

Table 7 demonstrates that six more students were determined to be reading below grade level than reading at grade level based on *Basic Reading Inventory* results during the 2018-2019 school year.

During Phase II of the study, students who did not receive a 715 or above on their most recent AIR test were assessed using the *Basic Reading Inventory* to determine whether or not they were reading at grade level. Table 8 demonstrates the amount of students who received a score signifying at or below grade-level reading based on *Basic Reading Inventory* results.

**Table 8**

*Basic Reading Inventory Scores for Phase II (2019-2020)*

19-20 School Year	Frequency	%
Grade Level Readers	49	36.3
Below Grade-Level Readers	86	63.7

As indicated in Table 8, during Phase II of the study 37 more students were considered reading below grade level than reading at grade level based on *Basic Reading Inventory* results.

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During Phase III of the study all students were assessed using the *Basic Reading Inventory* to assess whether or not they were reading at grade level. Table 9 demonstrates the amount of students who received scores signifying either at grade or below grade-level reading based on *Basic Reading Inventory* scores.

**Table 9**

*Basic Reading Inventory Scores for Phase III (2020-2021)*

20-21 School Year	Frequency	%
Grade Level Readers	100	50.3
Below Grade-Level Readers	99	49.7

As indicated in Table 9, during Phase III of the study, one more student was considered reading at grade level than below grade level based on *Basic Reading Inventory* results.

During Phase I, Phase II, and Phase III of the study, students that were determined as below grade level readers based on *Basic Reading Inventory* results were assessed using the *BAS 2* before and after receiving 21st-century literacy interventions to analyze the impact of interventions on student reading levels.

### **Research Question Analyses**

#### *Research Question One*

What is the impact of personalized, 21st-century literacy interventions on student reading levels over the course of one academic year?

- a. Is there a sustained impact of 21st-century literacy interventions on student reading levels when examined across three academic years?

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Pre-and post-data were collected using the *BAS 2* during each phase of the study. After being assessed using the *BAS 2*, students received reading level letters based on reading accuracy and comprehension scores (Appendix E). For analysis purposes, each student's Fountas & Pinnell reading letter level was transformed into a numeric value following basic measurement coding rules. Therefore, the coding followed an L = 12, M = 13, N = 14, etc. If a student was identified as below level L, their data were coded as a zero; if a student was identified as Z, their data were coded as 26, and if a student was identified as above Z, their data were coded as 27. The rules were followed consistently for all data, without deference to group membership. Transferring the letter values to numbers provided the opportunity to conduct statistical analyses estimating the degree of movement across the different levels of reading. Reading level letters coincide with grade levels and are demonstrated by the "F&P Text Level Gradient" (Appendix F). Table 10 provides the average student pre- and post-scores as measured by the *BAS 2* during Phase I, Phase II, and Phase III of the study.

**Table 10**

*Average Student Pre-and Post-Scores by Phase*

	Mean	N	SD	S.E.
Phase I Pre	19.60	5	4.39	1.97
Phase I Post	22.40	5	4.39	1.97
Phase II Pre	19.78	73	2.27	0.27
Phase II Post	21.52	73	2.80	0.33
Phase III Pre	19.55	80	3.80	0.43
Phase III Post	22.25	80	3.45	0.39

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When converting the above means to Fountas & Pinnell instructional reading level letters, Table 10 indicates that during Phase I, Phase II, and Phase III of the study, student reading levels increased from an average “T” Fountas & Pinnell level to an average “V” Fountas & Pinnell level. Translating using the “F&P Text Level Gradient” demonstrates that students grew from an average fourth- to fifth-grade reading level to an average fifth- to sixth-grade reading level.

Phase III of the study has the highest sample size while still demonstrating significant reading level growth. During Phase III of the study, ninth-grade student reading levels increased from an average “S” Fountas & Pinnell level to an average “V” Fountas & Pinnell level, while 10th-grade student reading levels increased from an average “U” Fountas & Pinnell level to an average “W” Fountas & Pinnell level. Translating using the “F&P Text Level Gradient” signifies that ninth-grade students began Phase III reading at an average fourth-to fifth grade level and ended the year reading at an average fifth- to sixth-grade level, while tenth-grade students started the year reading at an average fifth-grade level and ended the year reading at an average fifth- to sixth-grade level.

Running a pre- and post-dependent sample *t*-test clarified the average reading levels gained during each phase of the study. Table 11 provides data regarding student reading level growth during Phase I, Phase II, and Phase III of the study.

**Table 11***Pre-Post-Dependent Sample t-Test*

	Mean	SD	95% Confidence Interval of the Difference		t	df	Sig.
			Lower	Upper			
Phase I Pre- Phase I Post	2.80	1.64	-4.84	-0.76	-3.81	4	0.019
Phase II Pre- Phase II Post	1.74	1.72	-2.14	-1.34	-8.62	72	<0.001
Phase III Pre- Phase III Post	2.70	2.33	-3.22	-2.18	-10.39	79	<0.001

Table 11 data indicate that during Phase I of the study, students grew an average of three reading levels over the course of one academic year. During Phase II of the study, students grew an average of two reading levels over the course of one academic year. Furthermore, during Phase III of the study, students grew an average of three reading levels over the course of one academic year.

The difference in sample size during Phase I, Phase II, and Phase III demonstrates the significance between the average reading levels gained during each phase. Phase I had a considerably smaller sample size, creating less noise in the study (Trochim et al, 2016, p. 284); however, the larger sample sizes in Phase II and Phase III presents a more reliable estimate of impact (p. 103). Overall, all phases demonstrate significant growth in student reading levels as a result of 21st-century literacy interventions.

In order to determine longitudinal impacts of 21st-century literacy interventions, a small sample of student reading levels were examined during each year of the study. Table 12 demonstrates the results of a Repeated Measures Analyses (GLM) analyzing student Fountas & Pinnell reading levels across three academic years.

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**Table 12**

*Student Reading Levels Examined Across Three Academic Years*

	Mean	N	SD
2018-2019	17.56	9	2.88
2019-2020	20.89	9	1.62
2020-2021	22.56	9	2.13

Results of the GLM indicate that there is a significant difference in the average reading level of students in 2018-2019 relative to 2020-2021,  $F(3, 6)=203.75, p<.001$ . Specifically, results shown in Table 12 indicate that students who were reading at an average “R” Fountas & Pinnell level in fall of 2018 were reading at an average “W” level in fall 2020. “F&P Text Level Gradient” translation indicates students grew from an average fourth-grade level to an average fifth- to sixth grade level.

### *Research Question Two*

What are perceptions that high school students have in regard to literacy interventions and instruction received throughout their education?

To examine this question, qualitative interviews were conducted with six high school students at the STEM high school (setting of the current investigation). Purposive sampling was used to reflect a variety of phases in which students participated in the study, and to ensure the inclusion of students that received supplemental LLI. Table 13 demonstrates student demographic information in addition to pseudonyms chosen by participants.

**Table 13***Demographic Characteristics- High School Students*

Participant	Gender	Phases of Study Participated	Received LLL
Ethan	Male	Phase I, II	Yes
Raven	Female	Phase I, II	Yes
Austin	Male	Phase II, III	No
Kevin	Male	Phase II, III	Yes
Bella	Female	Phase III	No
Sammy	Male	Phase III	No

As indicated in Table 13, four students interviewed participated in two phases of the current study. Three students who were interviewed received supplemental LLI during at least one phase of the study.

After the student interviews, transcripts were coded and interrater reliability estimates were analyzed. The researcher shared the themes with the interviewer to assess the level of agreement, which was estimated at 100%. Three themes developed from the interview data are discussed below.

### **Theme 1: Student Perceptions**

Student choice and support from teachers increase student confidence and interest in learning. Reading interest level texts and encouragement from teachers emerged as important

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factors leading to positive student experiences. Interest in texts was identified as important by all six high school students. Austin shared, “...some types of books, if the topic isn’t too interesting to me, I fall off and it’s harder for me to read the book,” but with “...an interesting book, I’ll get 100% on that test.” Regarding reading enjoyment, Raven said, “Depends on what I’m reading. If it’s something that I’m interested in, then I like it.” Furthermore, Ethan stated, “I read not for entertainment, but to learn. So, a lot of times I will read manuals and documentations on how to set something up, like chairs... a lot of times with computers too, when I build stuff... so I know how to do it. So, I don’t have to ask for help later on.”

Additionally, encouragement from teachers was identified as a factor for building confidence in high school students. Four out of six students mentioned that encouragement from teachers can positively influence high school students. Kevin shared that he was positively influenced in English when “... in class I was doing good... one of the other students was struggling, so [the teacher] called me over and asked me if I could go help [the student] with their writing project. And I did, and then I helped a bunch of other kids with it too, because I got more comfortable talking to other people and explaining my thoughts to them.” Bella reflected on when she became a more confident reader, “The English teacher... sat down and really talked about, and wanted to help me... I feel like more teachers can physically sit down with someone... like sit down and just talk with how they’re doing, catch up on how they are.” Raven spoke on the topic of encouragement, stating that teachers should show “...more encouragement. And when [teachers] go to help, not to put down as they’re helping, but to encourage even when [students] make mistakes.”

### **Theme 2: Changing of Students’ Perceptions**

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Classroom requirements impact student confidence in reading if students view themselves as performing lower than their peers or are unable to complete assignments. Three out of six students mentioned lacking confidence in reading due to having to read out loud in front of their peers. Ethan shared, *“...when I read a book out loud, sometimes I’ll stumble my words, and when you’re reading in front of a group, it’s sort of embarrassing, because you’re reading and the words are in front of you, but all of a sudden you’re jumbling up your words, maybe the few times, and then everyone’s... in a middle school environment, that’s terrible.”*

When reflecting on past experiences with reading in middle school, Kevin shared his experience, *“We were in class and the teacher passed around a book, and we all had to read a chapter, because that’s how they did it. And I just kept messing up the one word, over and over again, because I was just so nervous to have to talk in front of the class. So, that definitely made me not want to read in front of people or any similar situation. It really messed up my public speaking skills. So, that was definitely discouraging.”* Also reflecting on a middle school experience, Bella stated, *“I had to read out to my group, and of course I had the passage that always had the words I can’t pronounce and everything, and stuff like that. I somewhat have a speech impediment so it was really hard. And at that point I was really embarrassed.”*

Five out of six students revealed that pressure from reading assessments led to discouragement. Austin mentioned, *“When I was little, those, like when you’re in elementary school and you know how you had the reading grade and all that stuff... Oh my God. That stuff used to mess with me.”* Ethan discussed a middle school experience when reading with peers, *“I would start on 1 page, and start going down and 5 minutes later a kid is already 3 pages ahead of me. And I would assume, maybe I’m just a slower reader than everybody else. And it’s fine, because some kids are different than I am, and not everyone is born the same. And I didn’t really*

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*let it slow me down, until the school system made it slow me down.*” When elaborating on his thoughts regarding pressure to perform in school, Ethan said, *“School needs to remove reading restrictions... Enforcing something on a kid who might not know how to read really well, would add a lot of stress to them, and create a lot of trauma at home, because sometimes the parents can’t help them because they’re busy with work or other kids, and it creates more problems than it solves.”*

### **Theme 3: Student Perceptions of Instruction**

When students view classroom content as relevant and are in an environment where they feel comfortable they become more engaged and positive learners. Four out of six students discussed the importance of instruction they viewed as relevant to their interests and learning styles. Upon reflecting on one of his high school experiences in math, Austin shared, *“I’m not good at math either, I can do it, but I’m not good at it. We were doing a project in math class about cars. I finished that project before anybody else. I don’t know how, but I did. And I was interested in it. I worked through the whole class, didn’t even look at the time once.”* Sammy said, *“I think for a teacher to really help a student with their overall ability to read and write, they should probably build off something that that student is more familiar with that’s associated with writing. Because that way they can actually have a formed interest in it and they don’t just get things thrown at their face that they don’t want to do.”*

Five out of six students mentioned the impact of small group instruction on their reading abilities. Raven, Ethan, and Kevin (student interviewees who had participated in Fountas’ and Pinnell’s LLI program during at least one phase of the current study) mentioned the positive impact that LLI had on their reading abilities. Raven shared, *“More comprehension I can do, speeds a little bit better. Other than that, I can understand and tell others what I read... It was*

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*fun, definitely with the students I was with too, they all understood each other. We all had the same issues. So, no one felt left out or discouraged when making mistakes.”* Ethan said, “...smaller groups, being able to break down to books that make sense to everyone. And have books that everyone can agree on and everyone can learn something from.” While Kevin stated, “I started answering the questions. And every time I answered the questions, I got every single one right.”

Additionally, five out of six students acknowledged their growth upon entering the STEM high school (the setting of the current investigation). Bella reflected, “I feel a lot better than I have. Because I feel that I’ve grown a lot. And my teachers, they’re great here. They really understand and they help if you need.” Austin spoke about how he transitioned to a more engaged learner at the school, “It’s way more hands-on, and that’s really what I’m good at.... When I came here... I just felt like a complete change in environment....The teachers we have here are great teachers.” Sammy shared, “In this school... It’s normally just like, “Okay. A new assignment, let’s see what this is.” Lastly, both Raven and Ethan discussed how they gained confidence as readers upon entering high school. Raven said, “It’s easier to go along with my assignments, but I still am a little behind the other kids, but not as far behind as I used to be.” While Ethan reflected, “When I came to high-school, and particularly... when I did a lot of reading with computer manuals. When they used all these technical terms, I felt like that helped a lot.”

### **Theme 4: Students’ Perceived Importance of Reading**

Reading was described as an important asset to being successful in the classroom and in the real world. All six students recognized the significance of reading across content areas. Sammy, Raven, and Austin discussed how reading assists with inquiry. Sammy noted, “It

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*definitely helps with other subjects because it allows me to... interpret certain words, but I also can understand directions better.*” Speaking to understanding assessments, Raven stated, *“I have to read like questions, and depending on how they’re wrote out, I have to understand what I’m reading.”* Austin mentioned, *“Language Arts is definitely one of the most important subjects, because ... you have to be able to understand that to understand every other subject.”* Bella, Ethan, and Kevin discussed how reading comprehension assists them in specific courses. Bella reflected, *“...in history class, we just read a whole bunch of articles today, and we had to like understand it. So, I feel like it’s very beneficial.”* Ethan said, *“Math you need to know what letters are letters, and if you don’t you can’t do variables. And science... this word carbon monoxide hydrate can be different from carbon dioxide, and if you jumble it up and say one when you mean the other, it means something totally different. And that’s when being able to break down words comes up. It’s important.”* While Kevin remarked, *“I’m in a software engineering class at the school... I’m definitely able to understand what we’re doing a lot easier, because I’m able to understand the words that they use to describe certain things.”*

Furthermore, all six students addressed the necessity of reading skills after high school. Raven shared, *“I think it’s important in a lot of things, because you still have to read resumes, read applications if you’re signing up for things, just any sort of paperwork.”* Bella spoke about the application of reading in her future career goal, *“I want to go for veterinary. So, that takes a lot with schooling and you have to do all the prescriptions if needed.”* Austin also expressed how English plays a role in his career aspiration, stating, *“... being a Tech Admin or IT guy... I’ll have to read manuals... but also part of it falls on the person who wrote it. If they’re not writing it with great context and skills in the manuals, it’s not great.”*

### *Research Question Three*

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What are perceptions that high school teachers have in regard to implementing 21st-century literacy interventions into their classrooms?

Qualitative interviews were again conducted in order to analyze this question. Four high school teachers employed at STEM high school participated in the interviews. Purposive sampling was used to reflect teachers that were required to instruct using 21st-century literacy interventions in their classrooms. Table 14 demonstrates pseudonyms chosen by participants and years participants have been employed in the educational field.

**Table 14**

*Demographic Characteristics- High School Teachers*

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Participant	Gender	Years in Education
Jean	Female	3
Ulysses	Male	4
Penny	Female	17
Jimmy	Female	8

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Table 14 demonstrates that two out of four participants taught for five years or less, and one participant taught for eight years. The most experienced participant has been in education for 17 years.

Again, following the interviews, transcripts were coded and interrater reliability estimates were analyzed. The level of agreement between the researcher and the interviewer was estimated at 100%. Three themes developed from the interview data and are discussed below.

**Theme 1: Teacher Perceptions of Literacy Instruction**

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Teachers at the STEM school believe that using 21st-century literacy interventions in their classrooms improve their instruction and overall student performance across content areas. All four teachers expressed that effective literacy instruction should extend beyond the English classroom. When reflecting on attributes of an impactful instructor, Jimmy stated, “...*someone who really can try to integrate literacy into all aspects of instruction is... really important.*” Penny shared, “*An effective literacy instructor is a teacher who understands that literacy doesn’t happen in a silo.*” Jean expressed that literacy can be used across the curriculum, “*I think to be an effective instructor you have to realize that just because you don’t teach English or reading, it doesn’t mean that there’s not literacy within your content and you shouldn’t incorporate it in the content.*”

In addition to Jean’s thought, all four instructors feel that literacy is prevalent across content areas. Jean further stated, “... *literacy is in every content, sometimes it just might look different... So, first recognizing that it’s a part of every content, and then taking the steps to implement it more with purpose.*” Penny and Jean mentioned how literacy contributes to assessment performance. Penny said, “*Reading is the reason why students fail math tests, most of the time. There’s a correlation. They are not able to necessarily read the problems, so maybe they know the content... Are we identifying the fact that they don’t know math? Or are we simply just validating the fact the kid can’t read?*” Furthermore, Jimmy shared, “*So many of the tests that students take are standardized, they are more so reading tests... so even just the way that you write your assessments is extremely important.*” In regards to whether literacy instruction has impacted standardized testing preparation, Ulysses replied, “*I have always used a very heavy literacy based teaching style. I don’t think it’s impacted anything negatively, it’s always been positive. I’ve hit my benchmarks before.*”

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Three out of four teachers shared specific literacy strategies, with two out of four teachers mentioning vocabulary instruction. Jimmy stated, *“I have students all pull vocabulary words from the text that they didn’t know... both content area vocabulary words and secondary vocabulary words... that has been really effective because everyone is asking questions, so it kind of at the same time gives me a gauge of where they are.”* Jean discussed the importance of vocabulary in math, *“...instead of focusing on how to solve an equation... focusing on what it means to solve an equation... what do those vocabulary words mean? What’s solving? What’s an equation? Instead of just going through the steps, really being purposeful about all the vocabulary.”*

Differentiating instruction to support student learning was discussed by all four teachers. Penny said, *“When schools ignore the fact that a 10th grader for example is on a 4th grade reading level, it’s like talking louder at someone who speaks a foreign language and expecting them to understand you. You could repeat yourself 15 times, and they’re not going to do it.”* She spoke to the benefit of differentiation, *“... you’re literally taking their wall down... They’re getting the content of what they’re learning, they’re getting confidence and strategies and how to tackle it, and then they’re slowly starting to build... the reading is not stopping them at square one.* Ulysses mentioned, *“... if a student can’t read at a 10th grade reading level, it’s not necessarily that they can’t reason through the Algebra... there’s a communication issue with the word problem itself... if you can’t read the problem and understand what they’re asking then you are inherently at a disadvantage.”*

All four teachers were aware of specific differentiation strategies for students. Jean reflected on differentiation techniques used in her classroom, *“The reading wasn’t at their level... I said, “Find the sum of the solutions of the 2 questions.” That was one prompt that went*

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*to my higher kids. And in the middle I said, "Solve each equation and then find the sum (add your answers together)." And then for my third one I put, "Solve for x. Solve for y. Add up (find the sum of) your answers from Part A and Part B." So there they were all doing the same problem. I wasn't differentiating the math content at all, all I did was differentiate... the instructions." Jimmy discussed differentiating assessment scores, "... it is very important to grade them based on their progress. It's more about growth, and how much can they improve in their literacy skills... if you have someone who is a really poor reader and then they get up to average, they should receive a similar score to someone who is an average reader and then excels beyond average."*

### **Theme 2: Perceived Student Impact**

Being a struggling reader can impact a student's self-confidence and participation in the classroom. All four teachers reflected on how being unable to answer questions can lead a student to underperform. Speaking to reading below grade level, Penny stated, *"I think it tears them up... When I went to school the names of the reading groups were terrible, we had like the cardinals and the crows. And everyone knew the crows... it's a label. And I think it's an embarrassing label, and the older the kid gets, the worse it is for a kid. So, their behavior is going to manifest in different ways. They may be absent. They may act out. They may try to find ways to get your mind off of the fact that they are unable to perform the task."* Jimmy also reflected, *"I think that can be very difficult for them... It seems like students who don't have a good vocabulary have difficulty sharing their thoughts and ideas with their peers and with the instructor... it definitely hurts them overall, it's not just an English problem."*

All four teachers mentioned how the importance of impactful instruction can help students grow academically can lead to a rise in student confidence. Jimmy discussed the

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importance of having good relationships with students, *“...if they don’t understand something they can or do feel comfortable coming to you and saying, “What does this question mean? Can you rephrase it? Can you reword it?”* Jean discussed a specific example with a student, *“I started to give those differentiated prompts, he really started to open up more and he would volunteer answers in class... when he was reading the problems at a level that he could understand, he felt way more confident volunteering his answers and talking to his classmates.”*

In addition to reading instruction benefiting students in school, all four teachers expressed how current literacy instruction can benefit students after high school. Jean reflected, *“We focus... on improving their reading, improving their writing, and on getting them all the other content that they need to know... focusing on that reading and writing really helps prepare them for their life after school. That helps them more than memorizing the quadratic formula.”* Ulysses stated, *“...being able to read opens the door to everything else... especially in the digital era. We live in a world where you have to be able to read and follow basic instructions and execute tasks. You aren’t always going to have someone there to walk you through or explain or reword... being able to do that yourself is critical.”* Jimmy elaborated, *“I think there’s so many things in this world that are inaccessible to people who don’t know how to read... I am a firm believer that if you don’t know how to read, you won’t be able to write... it will limit you.”*

### **Theme 3: Support for Literacy Instruction**

Effectively implementing literacy interventions is a learned process that takes time and ongoing support. Jean and Ulysses spoke about literacy interventions in teacher education programs. Jean noted, *“I think I had to take one reading class in college, but only one, and it didn’t really help me with any of this stuff. All this stuff I’m learning now is new... nothing in my degree program... would say it’s important to focus on literacy.”* Upon reflecting when teachers

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should learn literacy interventions, Ulysses said, *“Ideally they would learn it in college. That being said, as long as you learn it, it doesn't really matter where it comes from. But ideally you would learn it in school.”* Penny stated her reasoning behind why teachers should be supported by administration, *“If it is not supported with financial resources, time, training, and not sit and get training where teachers learn a new initiative and then it's never spoken of again... monitoring... follow through... it needs to be worked into the schedule. It is not something that can happen by going to the latest greatest seminar, and having a teacher come back and know where to start. You need the whole thing, and it needs to be consistent and it needs to be cyclical.”*

Jean and Jimmy discussed the importance of collaborative support when implementing cross-content literacy. Jean shared the importance of *“...having a good relationship with somebody in the building where literacy is their background, reading, writing, all the components of literacy... that's... their job... support the teachers, They can bring you ideas, and then help you with how to implement them.”* Jimmy noted, *“Literacy instruction can be supported by having a lot of collaboration between English teachers, Science teachers, and Math teachers. I think there is a really big potential to incorporate literacy into all aspects of education, such as word problems, scenario based questions, reading assignments... I think that's really important, having a good support network and being backed up by other teachers around you.”*

### Summary

Chapter 4 examined results of the current study, which used a mixed-methods approach to determine the impact of 21st-century literacy strategies on student reading levels, and student and teacher perceptions of literacy interventions. *Fountas' & Pinnell's BAS 2* data from pre- and

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post-collection phases were used to determine student growth during Phase I, Phase II, and Phase III of the study, as well as student growth examined across three academic years after being quantified. A pre- and post-dependent sample *t*-test was conducted to determine that students in each phase grew an average of three, two, and three Fountas & Pinnell reading levels, respectively. Additionally, results from a Repeated Measures Analysis (GLM) indicate that over a longitudinal three-year time span, students grew from an average fourth grade reading level to an average sixth-grade reading level.

Following pre- and post-data collection phases, qualitative interview data were collected by using purposive sampling to select six students who participated in at least one of the three phases of the study, and four teachers who were required to implement literacy interventions in their classrooms. From coding the student interview transcripts, four themes emerged: Student Perception, Changing of Students' Perceptions, Student Perceptions of Instruction, and Students' Perceived Importance of Reading. From coding the teacher interview transcripts, three themes emerged: Teacher Perceptions of Literacy Instruction, Perceived Student Impact, and Support for Literacy Instruction. Discussion of how these themes coordinate with quantitative data will be further examined in Chapter 5.

## Chapter 5

### **Discussion**

Based on the results of the current investigation, implementation of 21st-century literacy interventions in the secondary classroom can contribute to student growth if executed with fidelity. This current mixed-methods investigation focuses on the impact of 21st-century literacy interventions on student reading levels, as well as student and teacher perceptions of literacy interventions at the high school level. This study includes both the quantitative results from *Fountas' & Pinnell's BAS 2* data from pre- and post-collection phases, as well as qualitative data from interviews with students and teachers from the setting of the current investigation. The purpose of this research is to encourage high school administrators and teachers to adopt a collaborative approach to the inclusion of 21st-century literacy interventions across content areas.

The quantitative portion of this current investigation was completed in three phases over the course of three academic years. During each phase of the study, pre- and post- *Fountas & Pinnell BAS 2* data were collected to determine student growth after receiving literacy intervention instruction over the course of one academic year. After data were quantified, student growth was also examined across three academic years. Following pre- and post-data collection phases, qualitative interview data were collected by using purposive sampling to select six students and four teachers to examine perceptions of literacy interventions. Purposive sampling was used to ensure that each of the three phases of the current investigation were represented by at least two students. Additionally, purposive sampling was used to represent teachers who were required to instruct using 21st-century literacy interventions in their classrooms. Summaries,

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interpretations, context, and implications of the findings for each research question, as well as limitations and future research, are elaborated on below.

### **Research Question One**

What is the impact of personalized, 21st-century literacy interventions on student reading levels over the course of one academic year?

- a. Is there a sustained impact of 21st-century literacy interventions on student reading levels when examined across three academic years?

### ***Summary of Findings***

Results from pre- and post- *Fountas & Pinnell BAS 2* data indicate that after receiving 21st-century literacy interventions over the course of one academic year, students grew an average of three Fountas & Pinnell reading levels. After quantification of data, it was determined that after receiving 21st-century literacy interventions, students grew an average of five Fountas & Pinnell reading levels over the course of three academic years. Therefore, findings indicate that receiving 21st-century literacy interventions has a significant impact on student reading level growth in both the short- and long-term.

### ***Interpretation of Findings***

A pre- post dependent sample *t*-test indicates a statistically significant relationship between 21st-century literacy interventions and student reading level growth during Phase I ( $p=0.019$ ), Phase II ( $p<.001$ ) and Phase III ( $p<.001$ ) of the study. When examining the average student pre- and post-scores by phase, student reading levels increased from an average “T” Fountas & Pinnell level to an average “V” Fountas & Pinnell level during all three phases of the study. Translating the Fountas & Pinnell levels to grade-level goals using the “F&P Text Level Gradient” demonstrates that students grew from an average fourth- to fifth-grade reading level to

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an average fifth- to sixth-grade reading level during each phase of the current investigation. Additionally, results of a Repeated Measures Analyses (GLM) demonstrate a significant difference in the average reading level of students in 2018-2019 relative to 2020-2021 ( $p < .001$ ). Over a longitudinal three-year time span, students grew from an average “R” Fountas & Pinnell level to an average “W” Fountas & Pinnell level, meaning that students grew from an average fourth grade reading level to an average fifth-to sixth grade reading level after receiving 21st-century literacy interventions.

Qualitative student data demonstrates the impact that literacy interventions had on student achievement, as students mentioned how specific interventions supported their learning. When asked about the impact of literacy intervention, Raven said, *“I gained confidence in reading and the overall ability to know what I’m reading and speed and all.”* Additionally, Ethan mentioned, *“it helped me be able to break down complicated texts into something that I can understand easier.”* Regarding literacy interventions embedded across content courses, Sammy stated, *“... it definitely helps... because it allows me to... interpret certain words... I also can understand directions better.”* Qualitative teacher data presents that teachers also had successes when implementing literacy interventions into their courses. Penny spoke about the impact of literacy interventions on student growth, *“They’re getting the content of what they’re learning, they’re getting confidence and strategies and how to tackle it, and then they’re slowly starting to build. So, absolutely they’re learning more, because the reading is not stopping them at square one.”*

### ***Context of Findings***

Research showed that in 2018, 68% of Ohio middle and high school students scored proficient on Ohio’s English End-of-Course exam, and “53 percent of Ohio’s ACT test-takers

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scored below the remediation-free level on the English language arts assessment” (ODE, 2020a, p. 13). Quantified data demonstrates that during Phase I of the current investigation 57.9% of 38 students began the academic year as below grade level readers, during Phase II of the current investigation 63.7% of 86 students began the academic year as below grade level readers, and during Phase III of the current investigation, 49.7% of 199 students began the academic year below grade level readers. Pre-assessment data acquired from the *BAS 2* indicates that ninth- and 10th-grade students were reading at an average fourth- to fifth- grade reading level at the beginning of each phase of the current investigation. Data from the current investigation aligns with the idea that there is a need for reading interventions and an opportunity for students to “...learn to read proficiently” at the middle and high school levels (Scammacca et al., 2016, p. 784). Additionally, the current investigation demonstrates that when students are provided with individualized, 21st-century literacy interventions, students develop as readers.

The implementation of 21st-century literacy interventions demonstrated an average growth of three Fountas & Pinnell reading levels during the course of one academic year. The idea that “...vocabulary is tightly related to reading comprehension” (Beck et al, 2013, p. 1) was a driving factor towards the use of vocabulary instruction across content-areas at the STEM school. Teachers choose vocabulary words to focus on using a three-tier framework and instructing using both explicit (Archer & Hughes, 2011) and multidimensional instruction (Beck et al., 2013). Jean stated that a part of effectively instructing using vocabulary interventions is not “... *just going through the steps [but] really being purposeful about all the vocabulary.*” Jimmy shared, “*I have students all pull vocabulary words from the text that they didn’t know... both content area vocabulary words and secondary vocabulary words... that has*

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*been really effective because everyone is asking questions, so it kind of at the same time gives me a gauge of where they are.”*

Furthermore, the use of strategic actions has provided teachers with “...language for teaching, prompting, and reinforcing” reading and writing behaviors and “...language for teaching readers how to focus or expand their thinking through talk and writing before, during, and after reading” (Fountas & Pinnell, 2017c, p. 2). Raven believes that teachers should provide feedback by not “...put[ing] down as they’re helping, but to encourage even when [students] make mistakes.” Strategic actions assisted teachers with language and skills to provide positive, constructive feedback to support student needs.

Additionally, using the *BAS 2* to assess student reading levels at the beginning of the academic year provided “...diagnostic information about students” (Swain et al., 2017, p. 106). Teachers at the STEM school used differentiated instruction to provide students with texts at their Fountas & Pinnell literacy levels to provide “...instruction to develop decoding skills necessary to read independently” (Hastings, 2016, p. 65), as well as to engage students “...with challenging [texts] appropriate to their age and cognitive level” (p. 65). Ulysses reflected on the impact of differentiating instruction in his class, “*My students have a very strong sense of confidence that they can walk in and they know that they are going to get a text that they’ve never seen before... and they’re able to pull information accurately and relay that... with fidelity.*”

In regards to differentiation, teachers at the STEM school used small group collaboration in the form of literature circles or book clubs, where students with similar reading levels think critically about assigned texts or text sets. For example, the English teacher had a variety of text sets that included books and short stories with varying difficulty levels, all falling under the same

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genre or theme. For example, one text set used was dystopian novels: *1984* by George Orwell, *Among the Hidden* by Margaret Haddox, *Animal Farm* by George Orwell, *Divergent* by Veronica Roth, *Fahrenheit 451* by Ray Bradbury, *Hunger Games* by Suzanne Collins, and *Lord of the Flies* by William Golding. Austin reflected on his experience with small group literacy intervention, “...groups of 3 or 4 kids... read the book together. That’s awesome. That helps so much. Because you’re getting different perspectives, and thoughts on it from 4 different people at the same time. And it helps you understand the book a lot better... I’m trying to understand what he’s thinking, what she’s thinking, and it makes me understand the way I feel.” Supplemental Fountas and Pinnell LLI reading groups also focused on small numbers, which allowed for more individualized support and student inquiry. Ethan reflected on his experience with LLI at the STEM school, “...it was great because the group was small... there were only 4 or 5 people in the group... The books we read were great, a lot of them were very informative about some things, like archaeology, that can be pretty interesting... It gave some insight, some things I didn’t even know.”

In addition to 21st-century literacy interventions, the setting of the STEM school created opportunities for integrating technology into the curriculum. Therefore, authentic, real-world experiences were created for students, with a focus on disciplinary literacy. Kereluik et al. (2013) discussed how technology is used to retrieve and comprehend knowledge in “... almost all disciplines” (p. 132). When speaking about engagement at the STEM school, Austin said, “It’s way more hands-on, and that’s really what I’m good at.”

### ***Implication of Findings***

Results from the current study indicate that 21st-century literacy interventions lead to student reading level growth; therefore, aligning with the idea that “...students in Grades 4 to 12

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who are not reading at the level expected can... grow into their reading skills” (Scammacca et al., 2016, p. 784). Teachers could create lessons that combine literacy interventions with student choice and authentic experiences to engage students in the content. Additionally, teachers could create learning environments where students feel comfortable, and ensure that 21st-century literacy interventions are implemented with fidelity (Fisher et al., 2016). Jimmy shared, *“In addition to getting the differentiated pieces of literature... explaining it multiple different ways, multiple different times... layers and layers upon instruction... helps... reinforce the concepts and ideas [students] need to learn.”* Creating opportunities for all students to be involved and engaged could create opportunities for more shared experiences and perspectives; thus, expanding the potential of learning.

### **Research Question Two**

What are perceptions that high school students have in regard to literacy interventions and instruction received throughout their education?

### ***Summary of Findings***

Four themes emerged from student qualitative interviews regarding high school students’ perceptions in regards to literacy interventions and instruction: Student Perception, Changing of Students’ Perceptions, Student Perceptions of Instruction, and Students’ Perceived Importance of Reading. Regarding student perceptions, students valued choice and interest level texts, as well as positive support from teachers. Students expressed losing confidence when required to read out loud in front of their peers and when they realized they were not reading as well as their peers.

### ***Interpretation of Findings***

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Choice in interest level texts was valued by all six high school students. Four out of six students shared that teacher encouragement has a positive impact on learning. Furthermore, three out of six students mentioned losing reading confidence because of past experiences where reading out loud in front of classmates was required. Additionally, five out of six students stated that they have felt stressed because of reading assessments. However, students expressed that when receiving authentic instruction relative to their interests and learning styles, they became more positive towards reading. Four out of six students shared that authentic instruction tailored to their learning styles is beneficial, while five out of six students mentioned the benefit of small reading groups. Five out of six students shared that learning in a STEM high school has contributed to interest in learning. All six students acknowledged the importance of reading comprehension in content courses besides English, as well as spoke to the relevance of being able to read after high school.

### ***Context of Findings***

Obtaining a growth mindset is the idea that humans can expand by learning new knowledge or having new experiences (Dweck, 2006). When students have a choice in texts they are more willing to read, and can learn information that enables them to grow. Ethan expressed the importance of tailoring books to student interests, “... *they’ll find more value to it. So, if you wanted to read like a manual about how to build a computer, you could go find a book about how to build a computer and read that... because you’re learning something that is of value to you.*” Unfortunately, qualitative interview data demonstrated the stigma associated with low reading comprehension. Kevin noted, “*I just kept messing up the one word, over and over again, because I was just so nervous to have to talk in front of the class. So, that definitely made me not want to read in front of people or any similar situation.*” Abodeeb-Gentile & Zawilinski (2013)

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discussed that when students are labeled in certain ways regarding academia (i.e. levels), students tend to view themselves in that way. Therefore, students associate a stigma with low reading. Ethan reflected *“I would start on 1 page, and start going down and 5 minutes later a kid is already 3 pages ahead of me. And I would assume, maybe I’m just a slower reader than everybody else. And it’s fine, because some kids are different than I am, and not everyone is born the same. And I didn’t really let it slow me down, until the school system made it slow me down.”* Regarding the impact of low-literacy-related stigma on student performance, Penny shared, *“... their behavior is going to manifest in different ways. They may be absent. They may act out.”*

However, Landreth (2018) examined the idea that overcoming the stigma associated with low reading can lead students to view themselves as readers and become more confident. Fisher et al. (2016) stated the importance of building relationships with students in order to promote reading, writing, communication, and critical thinking skills. Bella shared, *“I feel a lot better than I have. Because I feel that I’ve grown a lot. And my teachers, they’re great here. They really understand and they help if you need.”* In addition to positive relationships, Fisher et al. (2016) also discussed the importance of differentiating literacy interventions and instruction so students can progress from surface level to deep level learning. Ethan spoke about the impact literacy interventions had on his development as a reader, *“... before, I’d look at a document and think there’s so much to read in it, and I might not know what it is.”* Ethan stated that now, *“I won’t be afraid to pick up a document and read through it... I’ll be able to look at it, skim through a few pages, and know they’re talking about... kind of what’s in the document no matter what it is.”* Austin reflected on how a supportive setting impacted his morale, *“When I came here... I just felt like a complete change in environment... I’m learning a lot. I feel smart... I never felt that way before, but I feel smart.”* Therefore, existing literature supports both quantitative and

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qualitative results of the current investigation: the use of personalized, 21st-century literacy interventions can positively impact student achievement and lead students to become more confident readers.

Overall, students understand the importance of reading across content areas and the significance of reading after high school. Moje (2008) discussed that the separation of disciplines in a high school setting has led to the mentality that knowledge is "... different in different disciplines" (p. 99). Penny stated, "*An effective literacy instructor is a teacher who understands that literacy doesn't happen in a silo.*" Therefore, exposing students to literacy across contents constantly reinforces their reading skills and prepares them to be comprehensive readers as they enter the real world.

### ***Implication of Findings***

A stereotype threat occurs when a person engages in a behavior that is a stereotype for the identity or group in which they are associated (Steele & Aronson, 1995). Therefore, stigma associated with low reading comprehension inhibits students from reaching their full potentials if they consider themselves lower than their peers. Quantitative data results suggest that students understand the importance of reading in all content areas and in the real world. Students want authentic and meaningful lessons, as well as positive and constructive feedback. Fisher et al. (2016) mentions the importance of developing positive student relationships by being credible and equitable, meeting students at their levels, and allowing students to have some choice in the classroom. Fostering healthy student relationships could assist teachers in getting to know student interests and learning styles. Furthermore, knowing where each student is academically, as well as knowing their interests, could help teachers to develop a personalized approach to literacy instruction for all students.

**Research Question Three**

What are perceptions that high school teachers have in regard to implementing 21st-century literacy interventions into their classrooms?

***Summary of Findings***

Three themes emerged from qualitative interviews regarding teacher's perceptions in regards to implementing 21st-century literacy interventions into their classrooms: Teacher Perceptions of Literacy Instruction, Perceived Student Impact, and Support for Literacy Instruction.

***Interpretation of Findings***

All four teachers believed that 21st-century literacy interventions played an important role in overall comprehension of classroom content and should be implemented across content areas. Specific literacy strategies were mentioned, with two out of four teachers mentioning vocabulary instruction and all four teachers mentioning the importance of and specific strategies related to differentiated instruction. All four teachers shared how stigma associated with low reading, as well as not being able to comprehend assessment questions, can impact student performance. However, all four teachers also agreed that literacy interventions can lead students to develop confidence and benefit students after high school. Two out of four teachers stated that they believe that teachers should be educated on 21st-century literacy interventions in teacher preparation programs. Furthermore, two out of four teachers discussed how administrative support and a collaborative learning environment are needed to effectively implement 21st-century literacy interventions across the curriculum.

***Context of Findings***

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Marzano (2004) discussed how vocabulary instruction at the secondary level leads students to develop background knowledge in order to understand classroom content. Additionally, Hattie et al. (2016) discussed the idea that some students may need surface level learning before deep level acquisition and knowledge transfer can take place. Penny discussed the importance of meeting students at their reading levels, “... when schools ignore the fact that a 10th grader for example is on a 4th grade reading level, it’s like talking louder at someone who speaks a foreign language and expecting them to understand you. You could repeat yourself 15 times, and they’re not going to do it.” She elaborated that although students may not be receiving assessments at their specific grade level, “They’re getting the content of what they’re learning, they’re getting confidence and strategies and how to tackle it, and then they’re slowly starting to build.”

Furthermore, Ryan (2006) discussed the impact of inclusive leadership, where members of an organization are encouraged and supported by the leader in order to be successful. When teachers feel supported and each member of the team contributes, motivation occurs; therefore, creating a collaborative school culture (Gruenert & Whitaker, 2015; Hargreaves & Fullan, 2012). Additionally, if teachers receive time to common plan, they can create effective literacy strategies tailored to the needs of their specific students and school environment. Jimmy stated, “...support really comes from creating a network of ... co-teachers that you can really rely on that may be able to help you reinforce some topics... that’s really important, having a good support network and being backed up by other teachers around you.” Two out of four teachers interviewed mentioned that they did not learn literacy intervention strategies in their teacher preparation programs; therefore, a strong, collaborative environment and ongoing professional development supported their growth.

### ***Implication of Findings***

Qualitative interviews expressed specific examples of how teachers can be supported in literacy instruction. Administrative licensure programs could educate prospective leaders on the importance of creating a collaborative school culture that values student literacy across the curriculum. Moreover, teacher preparation programs could focus more on the importance of literacy interventions and provide teachers with both content and disciplinary literacy intervention strategies. Teacher preparation programs could also educate students on the stigma associated with low reading skills and educate prospective teachers on how to develop positive relationships with students in order to prevent stereotype threats from occurring. If administrators and teachers saw the significance of the utilization of cross-curricular literacy interventions, overall results upon implementation could be successful.

In order to encourage teachers to implement 21st-century literacy interventions in their classrooms, administrators could create a schedule where teachers have time to plan together at least once or twice per week, as well as create potential co-teaching scenarios where teachers from different content areas teach a cross-curricular lesson. Moje (2008) stated that a collaborative approach to literacy instruction could take place with the restructuring of schools so that teachers are not isolated in their respective classrooms throughout the day. She also stated the benefits to reducing the pressures associated with covering standardized test content. As students begin to build reading comprehension and confidence, grade-level texts could be used with the appropriate supports.

### **Limitations**

The current investigation was aligned with up-to-date research regarding 21st-century literacy interventions and instruction. The sample was composed of students and teachers from

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the same building; therefore, limiting diversity within the sample and limiting generalization of the results to students and teachers similar to those included in this investigation. Additionally, the current investigation uses a purposive sample of students who were identified as in need of the literacy intervention. While this could be viewed as a limitation, the data cover three years of intervention data, and as such, provides results with potentially higher reliability and validity than what would have been gained from an experimental design. There is a possibility that resentful demoralization took place because of insecurities with reading out loud; however, students generally expressed a desire to perform well during pre- and-post *BAS 2* sessions. Another possible limitation is social desirability bias, although a third-party interviewer with no connection to the STEM school was used.

### ***Limitations Regarding Covid-19***

From March 13, 2020 until the end of the 2019-2020 academic year, June 2nd, 2020, the Covid-19 pandemic caused the STEM school to shift from in-person to fully-online instruction. Students still received 21st-century literacy interventions; however, fully-online instruction creates limitations regarding the internal validity of the study. In-person and small group literacy interventions could not be used during the time period when students were receiving online instruction. Additionally, students who participated in Phase II of the study received the *post-BAS 2* assessment during the second week of the 2020-2021 academic year. While the COVID-19 adjustments may have had an impact on the interventions' effect, it is likely that a greater impact would have been realized during a "normal" school year.

### **Future Research Directions**

The current study exhibited the positive correlation between 21st-century literacy interventions on student reading-level growth. Additionally, qualitative data demonstrated that

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both students and teachers value the implementation of 21st-century literacy interventions across the curriculum. However, results from the current study only touch upon the numerous reading interventions and instructional strategies available at the high school level. To increase generalizability, similar mixed-methods studies could be implemented in larger high schools with more diverse student and teacher populations. Also, more assessments, such as the Ohio English EOC AIR test, ACT tests, and student GPAs, could be used to further enhance data to drive instruction.

Additionally, future research could focus on how to effectively eliminate stigma around low reading comprehension and promote a mindset where low reading comprehension does not necessarily correlate with low academic performance. Eliminating low literacy-related stigma and engaging prospective administrators in the inclusion of 21st-century literacy interventions across content areas could be a discussion topic or course in administration programs. Furthermore, future research can focus on better introducing prospective teachers to reading intervention strategies during teacher preparation programs, especially focusing on benchmarking and differentiating instruction for students of all reading levels.

### **Conclusion**

Data acquired from the current mixed-methods investigation establishes that the use of individualized, 21st-century literacy interventions leads to both short- and long-term student growth. Additionally, both secondary teachers and students value the cross-content integration of 21st-century literacy interventions. Perhaps the most significant finding of this study, however, is the idea that viewing students as individual readers rather than a collective whole can cultivate confident individuals who can achieve far beyond the high school classroom. To improve reading comprehension for *all* students, it is important to view them as individuals. For example,

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Ethan, who was initially limited by reading assessments, later indicated, “*I didn’t really let it slow me down, until the school system made it slow me down.*” Educators need to change the system by breaking down barriers associated with the stigma around low-literacy and ensure that *all* students are readers.

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Appendix A



One University Plaza, Youngstown, Ohio 44555  
www.yosu.edu

January 11, 2021

Dr. Karen Larwin, Principal Investigator  
Ms. Melanie Brock, Co-investigator  
Department of Teacher Education and Leadership Studies  
UNIVERSITY

RE: IRB Protocol Number: 073-2021  
Title: Student and Teacher Perceptions Regarding 21<sup>st</sup> Century Literacy Instruction

Dear Dr. Larwin and Ms. Brock:

The Institutional Review Board of Youngstown State University has reviewed the above-mentioned Protocol via expedited review and determined that it meets the criteria of an expedited protocol, Category #7. Therefore, I am pleased to inform you that your project has been fully approved for one year. You must submit a Continuing Review Form and have your project approved by January 10, 2021, if your project continues beyond one year.

Any changes in your research activity should be promptly reported to the Institutional Review Board and may not be initiated without IRB approval except where necessary to eliminate hazard to human subjects. Any unanticipated problems involving risks to subjects should also be promptly reported to the IRB. Best wishes in the conduct of your study.

Sincerely,

Dr. Severine Van Slambrouck  
Director, Office of Research Services, Compliance and Initiatives  
Authorized Institutional Official

SVS:cc

c: Dr. Marcia Matanin, Chair  
Department of Teacher Education and Leadership Studies

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Appendix B

LL 4959  
(Grade 9)

Elizabeth Meets Darcy

Elizabeth watched for the first appearance of Pemberley Woods with some perturbation; and when at length they turned in at the lodge, her spirits were in a high flutter.	12
The park was very large and contained great variety of ground. They entered it in one of its lowest points, and drove for some time through a beautiful wood, stretching over a wide extent.	29
Elizabeth’s mind was too full for conversation, but she saw and admired every remarkable spot and point of view. They gradually ascended for half a mile, and then found themselves at the top of a considerable eminence, where the wood ceased, and the eye was immediately captured by Pemberley House, situated on the opposite side of a valley, into which the road with some abruptness wound. It was a large, handsome, stone structure, standing well on rising ground, and backed by a ridge of high woody hills. She had never seen a place for which nature had enhanced more, or where natural beauty had been so little counteracted by an awkward taste. They were all of them warm in their admiration, and at the moment she felt that to be mistress of Pemberley might be something!	46
	62
	63
	76
	92
	108
	122
	136
	154
	170
	187
	199
They descended the hill, crossed the bridge, and drove to the door; and, while examining the nearer aspect of the house, all her apprehensions of meeting its owner returned. As she walked across the lawn, Elizabeth turned back to look again, and the owner himself suddenly came forward from the road.	214
	230
	245
	250

Adapted from *Pride and Prejudice* by Jane Austen.

Total Miscues  Significant Miscues

**Writing Prompt:** Write about a time when you were impressed with someone or something.

**Note:** The rubric for evaluating the student's written response can be found in Appendix B.

Oral Reading Rate	Norm Group Percentile
WPM √15000	<input type="checkbox"/> 90 <input type="checkbox"/> 75 <input type="checkbox"/> 50 <input type="checkbox"/> 25 <input type="checkbox"/> 10

Word Recognition Scoring Guide		
Total Miscues	Level	Significant Miscues
0-3	Independent	0-2
4-12	Ind./Inst.	3-6
13	Instructional	7
14-24	Inst./Frustr.	8-12
25 +	Frustration	13 +

# RE-CONCEPTUALIZING SECONDARY LITERACY

Student Book copy is on page 102.

Lexile: 1150

**LL 4959** (Grade 9) Say: "I'd like you to read out loud [silently]. Think about what you're reading because I'll ask you some questions about it when you're done. Please begin here." [Point to title.]

## Elizabeth Meets Darcy

- T 1. \_\_\_\_ What is this passage about?  
(Elizabeth going to Pemberley Woods)
- F 2. \_\_\_\_ What did Pemberley House look like?  
(large; handsome; a stone structure [any 1])
- F 3. \_\_\_\_ Describe Pemberley Woods.  
(large; a forest; hilly; valley; woody [any 2])
- F 4. \_\_\_\_ How did the group feel about what they were seeing?  
(warm in their admiration; excited; happy)
- F 5. \_\_\_\_ What did they see when the woods ceased?  
(Pemberley House)
- F 6. \_\_\_\_ When did Elizabeth see the owner of Pemberley Woods?  
(when she came up to the outside of the house; as she walked across the lawn)
- F 7. \_\_\_\_ How did Elizabeth get to Pemberley Woods?  
(drove)
- I 8. \_\_\_\_ What does it mean when the story says that "Elizabeth's mind was too full for conversation"?  
(any logical response; Elizabeth's mind was preoccupied with worry)
- E 9. \_\_\_\_ Under what circumstances might someone be nervous about meeting the owner of a large mansion?  
(any logical response)
- V 10. \_\_\_\_ Explain what "ascended" means in this sentence: They gradually ascended for half a mile.  
(went up)

Questions Missed

Comprehension Scoring Guide	
Questions Missed	Level
0-1	Independent
1½-2	Ind./Inst.
2½	Instructional
3-4½	Inst./Frustr.
5 +	Frustration

Retelling Rubric
<b>Independent Level/Excellent</b>
States central or key ideas
Identifies important facts
Retains the general sequence of events
Relates most of the content in an organized manner
<b>Instructional Level/Satisfactory</b>
States most central or key ideas
Identifies some important facts
Retains the general sequence of events
Relates an overall sense of the content
<b>Frustration Level/Unsatisfactory</b>
Provides bits of information in a haphazard manner
Little apparent organization

Retelling Notes

Appendix C

Coding and Scoring Errors at-a-Glance

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Behavior	What the Reader Does	How to Code	Example	How to Score
Accurate Reading	Reads words correctly	Do not mark or place check (✓) above word	No mark or <u>✓</u> environments	No error
Substitution	Gives an incorrect response	Write the substituted word above the word	worry wonder	Substitution, not corrected 1 error
Multiple Substitutions	Makes several attempts at a word	Write each substitution in sequence above the word	speckles   spices   specials species  adept   adopt   SC adapted  to   touch   teeth tooth  Attie Arctic  can not   they're can't   they are	Multiple substitutions, not corrected 1 error for each incorrect word in text  Multiple substitutions, self-corrected (SC) No error; 1 SC  Multiple misreadings of the same word, not corrected 1 error for each incorrect word in text  Multiple misreadings of names and proper nouns 1 error first time missed; no errors after that  Misreading contractions (reads contraction as two words or two words as contraction) 1 error each time
Self-correction	Corrects a previous error	Write the error over the word, followed by SC	use   SC usually	No error; 1 SC
Insertion	Adds a word that is not in the text	Write in the inserted word using a caret	very ^	1 error per word inserted
Omission	Gives no response to a word	Place a dash (-) above the word	- only	Skipping a word 1 error per word  Skipping a line 1 error per word
Repetition	Reads same word again	Write R after the word	R	No error

Coding system developed by Marie Clay as part of the running record system in *An Observation Survey of Early Literacy Achievement*, Revised Second Edition, 2006, Heinemann.

# RE-CONCEPTUALIZING SECONDARY LITERACY

Behavior	What the Reader Does	How to Code	Example	How to Score	
Repeated Repetitions	Reads the same word more than once	Write R for the first repetition, then write a number for the additional repetitions	R <sub>1</sub> R <sub>3</sub>	No error	
Rereading	Returns to the beginning of sentence or phrase to read again  Rereads and self-corrects	Write R with an arrow back to the place where rereading began  Write R with an arrow back to the place where rereading began and a SC at point of self-correction	   theirselves sc R They can wrap themselves	No error  No error; 1 SC	
Appeal	Verbally asks for help	Write A above the word	<u>          </u> A environments	Follow up with "You try it"	No error
"You Try It"	The child appeals, the teacher responds with "You try it"	Write Y after the word	<u>          </u> A environments   Y	"You try it" followed by correct word  "You try it" followed by omission, incorrect word, or Told	No error  1 error
Told	Child doesn't attempt a word even after "You try it"	Write T after the word or the Y	<u>          </u> A environments   Y T  <u>          </u> A environments   T		1 error
Spelling Aloud	Child spells word by saying the names of letters	Write the letters in all capital letters	<u>E-V-E-R</u> ever	Spelling followed by correct word  Spelling followed by incorrect word	No error  1 error
Sounding Out	The child makes the sounds associated with the letters in the word	Write the letters in lower case with hyphens between them	<u>o-n-l-y</u> ✓ only  <u>t-em-per</u> temper temperature  <u>b-SC</u> polar	"Sounding out" followed by correct word  "Sounding out" followed by incorrect word or no word  Sounding the first letter incorrectly and then saying the word correctly	No error; no SC  1 error  No error; no SC

Coding system developed by Marie Clay as part of the running record system in An Observation Survey of Early Literacy Achievement, Revised Second Edition, 2006. Hestemom.

Appendix D

Recording Form **Part One: Oral Reading**

Benchmark Assessment System 2  
THIRD EDITION

**The International Space Station • Level Y • Nonfiction**

Student \_\_\_\_\_ Grade \_\_\_\_\_ Date \_\_\_\_\_

Teacher \_\_\_\_\_ School \_\_\_\_\_

Place the book in front of the student. Read the title and introduction.

**Introduction:** *The International Space Station is a gigantic laboratory in orbit above Earth. Read to learn about the ISS and how it is used.*

**Summary of Scores:**

Accuracy \_\_\_\_\_ Comprehension \_\_\_\_\_  
Self-correction \_\_\_\_\_ Writing About Reading \_\_\_\_\_  
Fluency \_\_\_\_\_

Sources of Information Used

Page	Start Time ____ min. ____ sec.	The International Space Station Level Y, RW: 202, E: 12	E	SC	E			SC			
					M	S	V	M	S	V	
1		Space-Age Laboratory									
		Imagine an enormous laboratory as long as a football field and weighing almost one million pounds. Now imagine this gigantic laboratory floating in space. Scientists and others from all over the world would be able to live there—for months, or maybe even years, at a time—before returning to Earth. Because environmental conditions in space are very different from those we experience on Earth, scientists could perform many critical experiments while living in this space laboratory that they cannot carry out on this planet.									
		It may sound like science fiction, but an international space station is already a reality. The International Space Station, or ISS, is a giant research facility now in orbit about 240 miles above Earth. It is not the first space station in									
		<b>Subtotal</b>									

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Recording Form **Part One: Oral Reading** *(continued)*

**The International Space Station • Level Y**

Page	Text	Sources of Information Used									
		E	SC	E			SC				
				M	S	V	M	S	V		
1 <i>cont.</i>	existence, but it is the largest and most complex object ever constructed in space. Scientists are considering adaptations that would need to be made in order to conduct long-term experimentation in space. At the same time, they have to examine the potential impact on humans, both physically and psychologically, of living in a space station—in close quarters with others and										
2	without access to the outdoor world—for such long periods of time.										
<b>Subtotal</b>											
<b>Total</b>											
 <b>End Time</b> ____ min. ____ sec.											

Have the student finish reading the book silently.

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Recording Form **Part One: Oral Reading** *(continued)*

**The International Space Station • Level Y**

 <b>Accuracy Rate</b>	<b>Errors</b>	<b>12 or more</b>	<b>10-11</b>	<b>8-9</b>	<b>6-7</b>	<b>4-5</b>	<b>1-3</b>	<b>0</b>
	<b>%</b>	Below 95%	95%	96%	97%	98%	99%	100%

 <b>Self-Corrections</b>	_____
---	-------

<b>Fluency Score</b>	0 1 2 3	<p><b>Fluency Scoring Key</b></p> <p><b>0</b> Reads primarily word-by-word with occasional but infrequent or inappropriate phrasing; no smooth or expressive interpretation, irregular pausing, and no attention to author's meaning or punctuation; no stress or inappropriate stress, and slow rate.</p> <p><b>1</b> Reads primarily in two-word phrases with some three- and four-word groups and some word-by-word reading; almost no smooth, expressive interpretation or pausing guided by author's meaning and punctuation; almost no stress or inappropriate stress, with slow rate most of the time.</p> <p><b>2</b> Reads primarily in three- or four-word phrase groups; some smooth, expressive interpretation and pausing guided by author's meaning and punctuation; mostly appropriate stress and rate with some slowdowns.</p> <p><b>3</b> Reads primarily in larger, meaningful phrases or word groups; mostly smooth, expressive interpretation and pausing guided by author's meaning and punctuation; appropriate stress and rate with only a few slowdowns.</p>

 <b>Reading Rate</b> <i>(Optional)</i>	End Time _____ min. _____ sec.
	Start Time _____ min. _____ sec.
	Total Time _____ min. _____ sec.
	Total Seconds _____
	$(RW \times 60) \div \text{Total Seconds} = \text{Words Per Minute (WPM)}$
	12,120 $\div$ _____ = _____ WPM

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Recording Form **Part Two: Comprehension Conversation**

**The International Space Station • Level Y**

Beginning with the first prompt, have a conversation with the student. Note the key understandings the student expresses. Use the prompts to give you information about the student's understanding. Score for evidence of all understandings expressed—with or without a prompt. For scoring details, see the rubric in the *Assessment Guide*. Circle the number in the score column that reflects the level of understanding demonstrated.

Comprehension Scoring Key	
3	Student demonstrates <b>proficiency</b> in understanding the text.
2	Student is <b>approaching proficiency</b> in understanding the text.
1	Student demonstrates <b>limited proficiency</b> in understanding the text.
0	Student's comprehension is <b>not proficient</b> .

Key Understandings	Prompts	Score
<p><b>Within the Text</b></p> <p>The International Space Station is a giant laboratory in space. It was built by scientists and technical experts from many different countries. The space station helps us learn more about living in space.</p> <p>Up to six crew members can live on the ISS at one time. The scientists perform experiments such as creating better medicines, light metals, and robots. They study the effects of space on the human body.</p> <p>Astronauts live in tight quarters and spend time away from their families. All food and water must be brought from Earth. But one day scientists hope to solve this problem so more people can visit, work, and live in space.</p> <p><i>Note any additional understandings:</i></p>	<p>Summarize the important information in the book.</p> <p>Is there anything else you'd like to add to your summary?</p>	0 1 2 3
<p><b>Beyond the Text</b></p> <p>The ISS is important because it helps us learn more about living in space. It provides opportunities for research in many areas such as engineering, medicine, and space exploration.</p> <p>First, we have to learn how spacecraft can make their own oxygen and electricity in space. We have to learn how to overcome the long-term effects of weightlessness, the inability to go outside, and living in close quarters on the human body.</p> <p>People all over the world can work together to solve problems and learn more about our world.</p> <p>Sample response: I think it's important to work with other countries to solve world problems. (Accept logical responses that connect to this text.)</p> <p><i>Note any additional understandings:</i></p>	<p>Why is the International Space Station important?</p> <p>Talk about the problems that need to be overcome before people can take long voyages in space.</p> <p>Talk about the big ideas or messages in this book.</p> <p>What do these messages mean to you?</p>	0 1 2 3

*Continued on next page*

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Recording Form Part Two: Comprehension Conversation *(continued)*

**The International Space Station • Level Y**

Key Understandings	Prompts	Score
<p><b>About the Text</b></p> <p>his book is nonfiction. It gives information about the International Space Station.</p> <p>The writer discusses both the successes and problems with the station. The station provides many research opportunities, but there are still problems to be solved, such as the long-term effects of space on the human body.</p> <p>The writer seems to think that the ISS is very important because he provides many arguments for its benefits.</p> <p>Sample response: The writer explains how people from many countries worked together to build the ISS and shows what each contributed in the graphic on page 2. (Accept logical opinions and note how well students support their ideas with evidence from the text.)</p> <p><i>Note any additional understandings:</i></p>	<p>What is the genre of this book? How do you know?</p> <p>How does the writer give a balanced view of the ISS?</p> <p>What do you think the writer’s point of view toward the ISS is? What makes you think that?</p> <p>What does the writer do to keep you interested? What else? Can you show an example?</p>	<p>0 1 2 3</p>

**Guide to Total Score, Levels L-Z**

- 8-9 Proficient
- 6-7 Approaching Proficiency
- 4-5 Limited Proficiency
- 0-3 Not Proficient

Total Score: \_\_\_\_\_ /9

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**Part Three: Writing About Reading** *(optional)*

Read the writing/drawing prompt on the next page to the student. Specify the amount of time for the student to complete the task. (See the *Assessment Guide* for more information.)

**Writing About Reading Scoring Key**

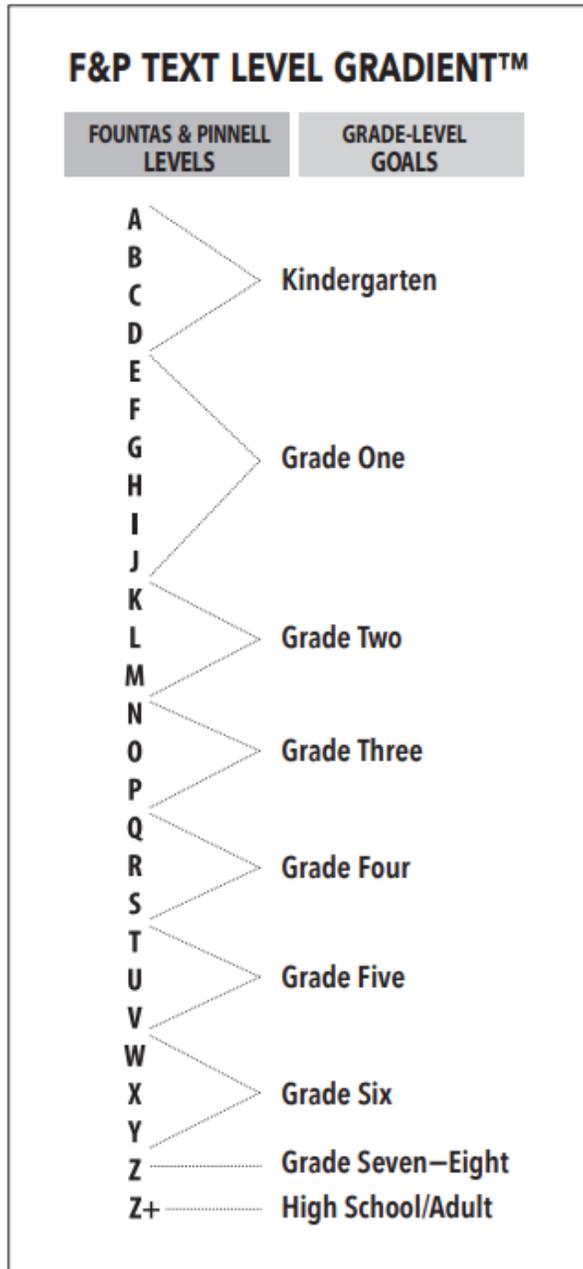
- 3 Reflects **excellent** understanding of the text.
- 2 Reflects **partial** understanding of the text.
- 1 Reflects **very limited** understanding of the text.
- 0 Reflects **no** understanding of the text.

RE-CONCEPTUALIZING SECONDARY LITERACY

Appendix E

<b>Finding the Three Levels, L–N</b>				
<b>Benchmark Criteria for Levels L–N</b>	<b>Comprehension</b>			
<b>Accuracy</b>	<b>Proficient 8–9</b>	<b>Approaching Proficiency 6–7</b>	<b>Limited Proficiency 4–5</b>	<b>Not Proficient 0–3</b>
98–100%	Independent	Independent	Instructional	Hard
95–97%	Instructional	Instructional	Hard	Hard
Below 95%	Hard	Hard	Hard	Hard

Appendix F



The grade-level goals on the F&P Text Level Gradient™ are intended to provide general guidelines, which should be adjusted based on school/district requirements and professional teacher judgement.

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RE-CONCEPTUALIZING SECONDARY LITERACY

Appendix G

**Phase I Average Student EOC English AIR Test Scores**

Most Recent ELA AIR Test Year	Academic Grade Level	N	Mean	SD	S.E
17-18	9	28	703.86	22.30	4.22
18-19	9	17	695.65	12.72	3.09

**Phase II Average Student EOC English AIR Test Scores**

Most Recent ELA AIR Test Year	Academic Grade Level	N	Mean	SD
18-19	9	63	686.63	22.89
18-19	10	59	695.83	12.10
17-18	10	15	688.13	12.96

**Phase III Average Student EOC English AIR Test Scores**

20-21		
Grade Level	Frequency	%
9	87	42.9
10	116	57.1