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HOW IMPLEMENTING WICOR IN HIGH SCHOOL CLASSROOMS ENCOURAGES CRITICAL  
THINKING SKILLS AND PROMOTES LIFE-LONG LEARNING

A MASTER'S THESIS  
SUBMITTED TO THE FACULTY  
OF BETHEL UNIVERSITY

BY

Tiffany Johnson

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HOW IMPLEMENTING WICOR IN HIGH SCHOOL CLASSROOMS ENCOURAGES CRITICAL  
THINKING SKILLS AND PROMOTES LIFE-LONG LEARNING

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December 2020

APPROVED

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## Abstract

Educators and policymakers have the responsibility of preparing students to be college and career ready, but many students entering postsecondary education are having to enroll in remedial courses to fill the learning gap created by secondary education. High school teachers need to shift their instructional mindset to include a more student-centered learning environment that promotes the learning of advanced literacy skills that should be explicitly taught across all content area classrooms. Teachers should model reading comprehension strategies in order to promote critical thinking and increase awareness of domain specific knowledge. Frequent, and purposeful writing activities should also be incorporated into instruction and should involve lengthier and more complex writing tasks to encourage critical thinking and prepare students for the demands of a postsecondary education. When reading, writing, and inquiry strategies are promoted within each subject area and students are encouraged to collaborate, reflect on their learning, and ask higher order questions, students' self-efficacy increases, and academic learning improves.

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## CHAPTER I: INTRODUCTION

### The Role of AVID

The goal of secondary institutions is to make all students college and career ready. But there is some confusion about what that really means—especially in the 21st century. My own teaching journey began a few years ago, and it was an awakening into the challenges of classroom teaching; learning about instructional alignment and finding various ways to engage students, support curriculum demands, and create a new generation of lifelong learners. By year two, I became the 9th grade AVID teacher in our building, thus began my crash course into college readiness curriculum.

AVID stands for Advancement Via Individual Determination and was created to reach the “middle” students and focuses on underrepresented minority students and first-generation college goers. According to Matthews (2015) the program was created by Mary Catherine Swanson, a former English teacher from Clairemont High School in San Diego in 1980 to address a large population of low-income students new to the building. Rather than shuffle them into remedial classes under the assumption they would struggle in most general education courses, Swanson recruited a group of these students and challenged them with taking the more rigorous Advanced Placement or honors classes, which is required to attend most four-year universities. Swanson realized early on that she needed to offer not just academic support, but a more familial one—where students experienced the feeling of being comfortable, safe, and valued. The program is also structured to guide students through the process of school and challenge them with not only working hard, but coaches them to stay organized, to be



respectful, and to learn important self-advocacy skills that promote a growth mindset approach to learning. Today, AVID has become the nation's largest college preparatory program with "about [400,000] students in five thousand schools, in forty-four states and several countries" (Matthews, 2015, p. 8).

AVID is successful because it supports not only the student but teachers as well. Teachers are provided with the educational tools and support needed to advance student learning within the AVID classroom. Teachers attend yearly summer institutes where they learn important skills and instructional strategies that can be implemented immediately into every content area classroom. AVID teaching is inquiry-based, and teachers instruct students in how to take effective notes and use higher-order questioning to get "to the conceptual root" of all their lessons (p. 3). Once teachers are trained in the best practice instructional techniques AVID is known for, it tends to influence the teaching practices of non-AVID teachers, "even in a small way with a few classes" (p. 2). Making AVID schoolwide, is the end goal for many proponents of the program, as it not only prepares students for more of the rigorous courses that students can expect from a four-year institution, but the program is also "is an enabling process [that] helps kids be learners" and succeed at the high school level (p. 212).

Even when systematic changes occur that affect a school's climate--whether through stagnant test scores or floundering educational reforms--the foundational structure of AVID remains solid. In 2002, President George W. Bush signed-off on the No Child Left Behind Act (NCLB) to address issues concerning the nation's low scores for math and reading achievement at the secondary level. This law forced accountability on

schools and their teachers in the form of state standardized testing to ensure proficiency in the core subject areas. Many teachers, pressured with improving test scores, shifted instruction towards teaching to the test. AVID, however, remained firm in the belief that their teachers knew best since “once trained, [they would continue] to make good decisions” related to instructional techniques (p. 253) and this held true, as most achievement scores in reading and math for AVID students were often above district averages nationwide. As the Common Core State Standards (CCSS) replaced NCLB in 2009, there was a stronger focus on making students college and career ready, yet the end result varied from state to state. In fact, many students leaving high school are not prepared for the rigors of college coursework even when deemed successful, since “less than a third of the students graduating from high schools across the nation are able to meet even the minimum state college-readiness standards” (Johnson, 2018, p. 1). According to Ravitch (2016), educational reforms such as “...NCLB, Race to the Top, and the Common Core standards shared the naïve assumption that all children will progress at the same rate if exposed to the same standards and tests...” (Prologue: xxiv) and this rationale was deeply flawed.

One of the components of Common Core was to bring awareness to the act of critical thinking within the classroom. In Dr. Conley’s 2003 landmark study, 400 university professors stated that having an “inquisitive nature was one of the characteristics of a college-or-career-ready student” (Johnson, 2018, p. 71-72). The idea that critical thinking must be developed at the high school level (Noddings, 2015) was not a new idea, and was already one of the key tenets of the AVID program. AVID

supports the idea that learners are problem solvers and that it takes a great deal of skill and cognitive ability in all areas to be able to solve a problem (Johnson, 2018). Over the years, AVID's success remains steady—with a 93% college acceptance rate (Matthews, 2015) so AVID's theory on how to best prepare students for college and career is being realized in remarkable ways.

### **College and Career SIP Team**

According to MN SLEDS (2019) data, only about 50% of post-secondary students who graduate from Anoka-Hennepin school district go on to earn a degree from a 2-year or 4-year college. In fact, only 17% of students finish within four years indicating a definite shift in the school system and identifying a possible gap in how students learn and what they need to know to be successful in postsecondary education. Andover High School is one of five traditional public high schools set in the suburbs and is part of the Anoka Hennepin School District #11. Andover has about 30,000 residents and the high school has approximately 1,700 students. The school has a minority enrollment of about 12 percent (majority identified as Black or Hispanic) with 4-8% of students qualifying for free or reduced lunch (Public School Review, 2020). The high school follows a trimester block schedule and runs a modified AVID Program adopted by its school district (ISD #11) with four sections of the AVID elective for grades 9-12. Each class has anywhere from 15-30 kids per elective section depending on grade level.

For the last two years, I have been a member of our buildings' College & Career School Improvement Program (SIP) and much of the information we share with the teachers and staff in the building during professional development opportunities often

stems directly from AVID's program. The cornerstone of the AVID program is known as WICOR: Writing, Inquiry, Collaboration, Organization, and Reading (Matthews, 2015) and AVID elective classes use these components to guide instruction and support student learning. Schools that have implemented AVID into their classrooms are purposeful in the way they incorporate these five major components into the AVID elective which changes the way public schools teach (Matthews, 2015). All the instructional lessons and activities are constructed around these five major components and are the driving force behind AVID's success. As the Common Core has placed more of an emphasis "on so-called soft skills: the ability to listen, to work cooperatively in groups, to communicate effectively orally as well as in writing, and to appreciate cultural diversity" (Noddings, 2015, p. 98) WICOR strategies can be aligned to meet these educational needs.

Even though AVID is not schoolwide in our building, the ease in which some teachers are able to implement parts of the AVID program to support best practice is a testament to the strength of these WICOR strategies used to engage students and support college and career readiness. During professional development presentations, the College and Career SIP team has tried to promote the following skills and/or activities that support WICOR for use within the classroom: Cornell Notes and Focused note-taking, Costa's Levels of Questioning; Socratic Seminars; Philosophical Chairs; Tutorials; Think-Alouds; Goal-Setting; binder and planner usage; graphic organizers, and advocacy of various technology platforms/tools to support close reading strategies, collaboration, discussion, and writing: (Perusall, Nearpod, Vocabulary.com, Quill.org).

Andover High School does a great job in promoting college and career within the building by organizing field trips, promoting weekly College apparel days, hosting bi-yearly college fairs, and have even increased class sizes for Honors level coursework and/or Advanced Placement (AP) classes throughout the building. Even though we cannot implement AVID schoolwide or require all 9th grade students to take AVID, we have a 97% graduation rate (Public School Review, 2020) and we strive to make the AVID strategies accessible for all teachers by reminding them of best practice techniques that align with college & career readiness goals. In addition, our building has had some success in recruiting and sending content area teachers to AVID's Summer Institute each year.

Yet despite a school's best efforts, it is concerning to see that many students still need to meet the educational demands required to be successful in content area classrooms. Gillespie, Graham, Kiuvara, and Herbert (2014) state that "approximately 87% of all public school students in the US must now become adept at using writing to help them analyze and think about information presented in class and the text they read" (p. 1045) and "more assessments are being developed that will require students to use writing to demonstrate their understanding of content materials" (p. 1077) which makes writing even more important in school. Furthermore, students must not only build content-area knowledge, but also "discipline-specific tools that will benefit the students' subject-specific learning" and this combined reading and writing emphasis is known as adolescent literacy (Miller, Scott, & McTigue, 2018, p. 85). To be able to think and reason critically is also extremely important, and many national assessments have

been modified to meet this demand, since “The College Board recently revamped the SAT to better assess students’ critical thinking. And ACT, Inc. offers a test of critical thinking for college students” (Willingham, 2008, p. 21). Shanahan & Shanahan (2008) found that one international standardized test, The Programme for International Assessment (PISA), is designed to compare student achievement internationally and the data reveals that “American 15-year-olds do not perform as well in reading as their age-matched peers in fourteen other countries” and actually outperform the “U.S. students on all of the other various reading scales” (p. 42). If more teachers learn to embrace the tenets of the AVID program and incorporate some of these best teaching practices with more intention and purpose, more high school teachers will move beyond teaching “content” to using their content area to teach critical thinking skills and promote lifelong learning skills.

## **CHAPTER II: LITERATURE REVIEW**

### **Literature Search Procedures**

To locate the literature for this thesis, searches of Educator's Reference Complete, Expanded Academic ASAP, Education Journals, ERIC, Academic Search Premier, EBSCO MegaFILE, and Google Scholar were conducted for publications from 1980-2020. This list was narrowed by using the research question to guide the review of published empirical studies from peer-reviewed journals that focused on the benefits of writing, reading, inquiry, collaboration, organization and professional development within a secondary classroom setting. The key words that were used in these searches included "benefits of reading," "benefits of writing," "inquiry," "collaboration," "benefits of organization," "evidenced-based practices to promote critical thinking," "disciplinary literacy," "professional development content literacy," "AVID," "WICOR Strategies," and "social/emotional learning." The purpose of this chapter is to review the literature on the benefits and challenges of implementing WICOR in high school content-area classrooms in five main sections in this order: Writing; Inquiry; Collaboration; Organization; and Reading.

#### **Writing**

It is the role of education to prepare students for a successful life, and as technology evolves and communication levels increase, there is a need for more advanced literacy skills to support social, academic, economic, and civic success (Graham & Perin, 2007; Shanahan & Shanahan, 2008). Given that the No Child Left Behind Act (NCLB) emphasizes reading achievement rather than writing, a shift has

occurred that has impacted the teaching and learning of literacy across “all levels of public education” (Applebee & Langer, 2009, p. 18). To determine how this shift has impacted secondary learners, Applebee and Langer (2009) examined data from the 2007 National Assessment of Educational Progress (NAEP) exams and found that 80%-90% of middle and high school students had achieved basic writing skill according to their grade level, “but only 31% at Grade 8 and 23% at Grade 12 were rated as ‘proficient’” (p. 19). If schools only expect students to master basic writing skills, then they will not be prepared for college or career (Ravitch, 2016; Graham & Perin, 2007; Shanahan & Shanahan, 2008; Snow & Moje, 2010). Research also indicates that teachers are forced to use more instructional time that focuses on reading, rather than writing, in order to support the shift towards high-stakes testing (Applebee & Langer 2009), but many experts argue that tests have their limitations and should be used in conjunction with other measures to determine a students’ knowledge or skill level (Ravitch, 2016; Robledo 2015).

The quality of instruction has always been at the forefront of educational reform, and the continued expectation is for there to be a balance of critical literacy within the classroom. Fisher (2009) wanted to examine the use of instructional time in the typical high school classroom, so a study was conducted at a suburban high school with a student population of approximately 1,500 students to determine how much instructional time is allocated within a traditional five-period format classroom. The author observed three random students, two boys and one girl, over the course of three days as they attended all five of their classes. Extensive notes were taken during each



observation focusing on what students were doing throughout the entire class time to better assess common teaching practices. The expected outcome was for students to be engaged in classroom activities that promote peer interaction, as well as reading and writing activities that encourage critical literacy. According to Fisher (2009), the majority of the time, about 48%, was spent in “listening activities, such as lecture and film” and although some students took notes, the expectation was for students to sit quietly and avoid disrupting “the flow of the classroom” (p. 171). In addition, only about 1.3 minutes per class was spent, on average, engaged in some sort of writing activity—usually summarizing rather than practicing more advanced writing skills. The NAEP data, which not only measures student performance, but gathers background data about teachers’ and students’ perceptions of curriculum and instruction, reported similar findings stating that the majority of 8<sup>th</sup> and 12<sup>th</sup> grade students indicated that writing rarely takes place more than once a week within the English language arts classroom and even less frequently in other content areas and that most students are not writing extended papers at any length or with complexity (Applebee & Langer, 2009; Gillespie et al., 2014). Students will not develop strong writing skills unless they are given frequent opportunities to write (Applebee & Langer, 2009; Bangert-Drowns, Hurley, & Wilkinson, 2004; Fisher, 2009; Graham & Harris, 1997) and more importantly, engage with specific writing tasks associated with each core content subject area. As students transition into high school, literacy learning is often sacrificed for subject area content (Wendt, 2013), but it’s critical for content-area teachers to “understand the rules for reading and writing in their disciplines and know how to teach those rules to students” (Snow &

Moje, 2010) since “content-area literacy is incomplete without the incorporation of writing” (Miller et al., 2018, p. 85).

### **Benefits of Writing**

It is necessary for teachers to align the curriculum so that writing instruction and tasks are scaffolded appropriately from primary to secondary school. The expectation that students know how to be successful writers by the time they enter high school is a false assumption, and educators need to revisit how writing instruction is implemented within each content-area classroom at the high school level (Englert, 1992). As Shanahan and Shanahan (2008) point out, “...as students move through school, reading and writing instruction should become increasingly disciplinary, reinforcing and supporting student performance with the kinds of texts and interpretive standards that are needed in the various disciplines or subjects” (p. 57). In a meta-analysis study, researchers Bangert-Drowns et al., (2004) investigated variation in research findings about the benefits of writing-to-learn programs. The researchers analyzed 48 writing-to-learn studies, published between 1926 and 1999, that were conducted with students in K-12 schools and examined its effect on academic achievement in order to better understand the relationship between writing and learning. The studies selected focused on academic achievement comparisons of writing-to-learn interventions across core content areas and in a conventional instructional setting. Researchers wanted to investigate and try to understand how writing about subject matter content might improve the potential learning of that content. Overall, the findings suggest that focused writing instruction results in positive effects on content learning and academic

achievement, especially when teachers encourage students to focus on metacognition and reflection as it creates “opportunities for students to evaluate their own understandings, confusions, and feelings about a topic” (p. 32). When teachers used writing prompts to assess student understanding of content, student achievement increased (p. 49) as the study confirms, “...writing so closely resembles learning and thinking that it is seen as a concrete manifestation of those cognitive processes...and according to this view, to write is to learn” (p. 48).

There is a need for improvement in how schools are aligning instruction with standards with a special focus on what is happening in writing, including frequency, length, [and] types of writing tasks (Applebee & Langer, 2009; Bangert-Drowns et al., 2004; Fisher, 2009) and since content-area writing tasks are beneficial in improving a students’ cognitive activity (Miller et al., 2018), it is essential that assigned writing tasks are directly connected to learning outcomes and not just assigned for the sake of assigning (Bangert-Drowns et al., 2004). Gillespie et al., (2014) conducted a national survey that generated a random sample of 9-12 high school teachers about their use of writing to support learning in the four core content areas (English, Social Studies, Science, and Math). Teachers were provided with 43 writing-to-learn activities and were asked how frequently they used each activity within their classrooms and the type of instructional situation that prompted each use. Results show that 82% of teachers reported using writing to support learning and that the most common writing activity used in the classroom was note-taking as “83% [of teachers] indicated their students used this writing activity during lectures [and] 42% during reading...” (p. 1060). The

study also found that there was a significant difference by subject area when it came to writing-to-learn activities and that most language arts and social studies teachers would encourage independent practice of the writing-to-learn activity and would even help students identify other situations where they could apply the activity, assess its impact or even extend instruction to better support student learning. "Overall, teachers' moderately agreed that writing to learn activities were effective in improving the learning of a wide range of students..." (p. 1065). Finally, the survey assessed the comfort level of teachers when incorporating a writing activity as a tool to support learning. Similar to other research studies, the results suggest that students need practice writing in all content area classrooms but that more lengthy and complex writing activities should be applied in other core classes to improve student learning and comprehension (Applebee & Langer, 2009; Bangert-Drowns et al., 2004; Fisher, 2009; Gillespie et al., 2014; Miller et al., 2018; Wong, 1997). Furthermore, Gillespie et al., (2014) believe that to be effective, writing-to-learn activities need to be explicitly taught and modeled for students more often, since their findings indicate it only happened 53% of the time. A similar conclusion was drawn from another qualitative study in which Miller et al., (2018) investigated how the incorporation of writing tasks into content-area instruction benefits student learning and knowledge attainment. Researchers conducted a systematic review to explore the current research findings about writing instruction in secondary content-area classrooms. The studies collected and reviewed were published between January 1, 2000 and June 24, 2016 and the results suggest that the following key components be included to support domain-specific learning: all

teachers should model and encourage the use of prewriting strategies as an approach to completing assigned writing tasks; in addition, teachers should implement an inquiry-based philosophy as they explicitly teach writing instruction as this improves learning and promotes independent thinking; and finally, writing tasks should be assigned regularly and be directly tied to student learning outcomes. Not only will teachers be able to better assess student understanding, but “when thoughtfully planned within an instructional setting that encourages cognitive acts, content area writing tasks positively impact a variety of students’ learning outcomes” across disciplines and different types of learners (p. 115).

To further support student learning and writing, teachers should explicitly teach and model writing strategies, as it prepares students for the deeper thinking needed to comprehend difficult concepts related to domain-specific information and content. Englert (1992) examined eight general education and eight special education teachers’ instructional practices over the course of a year during writing instruction and found that when teachers modeled the writing process and taught specific writing strategies, then students were able to employ the use of these strategies during a gradual release towards independent practice. In addition, the modeling of strategies and the use of content-area vocabulary during the think-aloud instruction encouraged students to practice self-talk, which also supports comprehension of content as it encourages the use of tier II and tier III vocabulary needed to understand the specific subject matter. As Oppong-Nuako, Shore, Saunders-Stewart, and Gyles (2015) state, “disciplines differ most obviously in the content, but also in how the content is organized...” (p. 200) and

explicit instruction of writing strategies with a clear purpose is essential, or the learning outcome will not be effective (Harris, Santangelo, & Graham, 2008; Snow & Moje, 2010). Although short, focused writing is important, Applebee and Langer (2009) believe that “extended writing is necessary to explore ideas or develop arguments in depth” (p. 26) and that more complex, process writing is necessary at the high school level and in all content-area classrooms since that is the demand students will face in post-secondary education (Englert, 1992; Fisher, 2009; Gillespie et al., 2014; Miller et al., 2018; Wong, 1997).

It is critical that the learner feel confident when taking on writing tasks as their attitude often determines their success (Reeve, 2009), but there is a difference between writing-to-learn and learning to write—as both are critical in supporting and improving student learning. Wong (1997) conducted an intensive three-year long-term writing intervention focused on adolescents with learning disabilities (LD) and low achievement to determine if extensive and explicit writing instruction would improve student writing and increase a sense of self-efficacy in writing achievement. The results indicate that students improved significantly in the quality of their writing. When students are explicitly taught the steps of the writing process (planning, writing, revising, editing) and the frequency of writing opportunities is increased, learning outcomes improve (Applebee & Langer 2009; Bangert-Drowns et al., 2004; Englert, 1992; Graham & Harris, 1997; Harris et al., 2008; Miller et al., 2018; Troia & Graham, 2003). It is also beneficial throughout the writing process when students are encouraged to collaborate with their peers (Englert, 1992; Graham & Harris, 1997; Harris et al., 2008; Wong, 1997), when

teachers provide writing exemplars or graphic organizers (Englert, 1992; Graham & Perin, 2007; Wong, 1997), when students use word-processing technology (Graham & Perin, 2007; Wendt, 2013; Wong, 1997), and when they receive individualized feedback (Harris et al., 2008; Troia & Graham, 2003; Wong, 1997). If explicit and process writing instruction was implemented across all content areas, not only would students' general attitude towards writing improve, but it would better prepare students for assessments since writing tasks involve critical thinking and reasoning (Miller et al., 2018). In addition, teachers could use the assessment results to guide future instructional planning and provide students with new insight into "the larger disciplinary conversations [that occur] outside the classroom" (Miller et al., 2018, p. 105).

**Challenges of implementation.** According to Englert (1992), there is an "underlying assumption...that students...learn to write simply by being asked to write..." (p. 153) and although writing instruction is still prevalent in American schools, research has identified problems with the frequency of writing and in the length and complexity of writing tasks in content-area classrooms at the high school level (Applebee & Langer, 2009; Englert, 1992; Fisher, 2009; Gillespie et al., 2014; Miller et al., 2018; Wong, 1997). Some suggest that students should be given choice in what they write about in order to increase engagement and that they may be more motivated to write if they are given a genuine writing task aimed at a broader audience (Graham & Harris, 1997; Troia & Graham, 2003). Fisher (2009) argues that "learning to inform, entertain, and persuade through the written word is one of the most important things we can teach students" (p. 175). So why aren't more students writing in core classes? Some researchers believe

that most teachers lack the knowledge and skill when it comes to writing instruction and feel underprepared to discuss the effectiveness of a particular writing strategy or to offer insight into when or where students might apply the strategy to other areas of learning (Gillespie et al., 2014; Troia & Graham, 2003). Graham and Perin (2007) conducted a meta-analysis review to identify effective practices for teaching writing to adolescents and found that many teachers lack the proper training when it comes to writing instruction, but when they were involved in professional development to better understand the writing process approach, “there was a moderate effect on the quality of students’ writing” (p. 26). Teachers need not only a basic understanding of writing strategies but would benefit from more domain-specific training as well (Barry, 2002) since learning to teach literacy “requires sophisticated skills to embed thoughtful knowledge development practices [and] strategy instruction” associated with writing-to-learn activities within each subject matter area and being able to “differentiate that instruction to meet the varying needs of [every learner]” (Snow & Moje, 2010, p. 68).

**SRSD method.** One benefit of research is to provide teachers with an immediate and practical strategy that can be implemented within the classroom during instruction. Many strategies exist and using strategies intentionally is a conscious decision by the teacher to address a problem or achieve a goal (Snow & Moje, 2010); in this case, it is to increase writing instruction within content area high school classrooms and the primary goal for explicit strategy instruction “is to teach students specific skills, knowledge, or processes that they can use independently once instruction has ended” (Graham & Perin, 2007, p. 11). One such strategy called the Self-Regulated Strategy Development



(SRSD) is an instructional method for teachers to use within the classroom that focuses on explicitly teaching the writing process including planning, writing, revising, and editing and strives to support students “in the ongoing development of the abilities and strategies needed to monitor and manage their own writing (e.g., goal setting, self-monitoring, using self-instructions, self-evaluating, and self-reinforcing)” (Harris et al., 2008, p. 397) as it relates to the idea that the process of writing is more important than the end product. SRSD instruction involves six stages where teachers explicitly model and teach specific writing strategies with the intent of guiding learning until students can self-regulate and practice the writing strategies independently—which is the end goal when teaching strategy usage (Alvermann, 2002; Englert, 1992; Graham & Perin, 2007; Harris et al., 2008). The stages are as follows: 1) developing or activating background knowledge and allowing students to reflect on their own level of writing skill; 2) discussing various strategy use and establishing student writing goals; 3) modeling for students strategies and selected types of self-instruction during the actual writing phase; 4) engaging in fun activities to promote memorization of writing strategies; 5) scaffolding support for students based on their individual writing needs and encouraging peer collaboration to further encourage independent practice; 6) transitioning into independent practice as students are encouraged to use self-instructions and writing strategies independently. Even though the SRSD approach is flexible and teachers can shift instruction to support the individual, small group, or whole class depending on students’ writing needs, it does require extensive class time and teacher training to implement its use effectively. But once implemented, the SRSD

instructional approach supports best practice techniques: extensive modeling of skills and strategies, use of scaffolding to support student learning, encouraging discussion and collaboration (teacher-student and student-student), and authentic writing practice to promote literacy (Alvermann, 2002; Englert, 1992; Graham & Perin, 2007; Harris et al., 2008; Troia & Graham, 2003).

### **Inquiry**

Before teachers can consider the act of questioning as a method to support and advance student learning, the way a student learns must first be acknowledged. Critical thinking is a necessary cognitive function that supports the process of inquiry and deserves closer examination to determine a students' ability level.

### **Critical Thinking**

We live in a time when there are many world issues that are constantly evolving, and there is a need for educated and learned individuals to evaluate complex scenarios and approach problems with serious effort to address these critical issues without jumping to conclusions in their search for answers (Noddings, 2015; Robledo, 2015). Trying to get students to engage in the process of their own learning can be difficult as schools have trained students to become passive learners where they sit quietly and listen as the teacher delivers content (Fisher, 2009; Johnson, 2018; Robledo, 2015). Parents should be asking "Does my child know how to be a critical thinker in order to be an effective learner?" (Johnson, 2018, p. 25) as according to developmental psychologist Jean Piaget's theory on cognitive development, adolescent learners have the ability to think abstractly and can show deeper thinking about concepts and ideas related to

subject-area content (Robledo, 2015). But as many educational reformers have called for schools to do a better job of teaching critical thinking skills, Willingham (2008) has reasoned that critical thinking cannot really be taught in isolation; instead, it requires teachers taking a different approach in the classroom related to student thinking about content. Critical thinking involves the act of thinking in connection to the building of domain specific knowledge. If students lack content area knowledge, then the act of thinking critically becomes incredibly difficult (Fisher, 2009; Johnson, 2018; Oppong-Nuako et al., 2015; Tuyay, Floriani, Yeager, Dixon, & Green, 1995; Wendt, 2013; Willingham, 2008).

Critical thinking, Willingham (2008) argues, has to do with how the brain collects and sorts information and being able to absorb subject area information and make comparisons allows the learner to see the deeper complexities connected to certain topics and ideas. Once the brain can effectively sort incoming information and make sense of it, they can start seeing the “deep structure of a problem” (Willingham, 2008, p. 22). It doesn’t mean students are able to immediately transfer their thinking and apply it to other subject areas, but that is something each content area teacher can address by encouraging metacognition and building domain-specific knowledge to improve learning (Alvermann, 2002; Bangert-Drowns et al, 2004; Fisher, 2009; Flick, 1998; Johnson, 2018; Levy, Thomas, Drago, & Rex, 2013; Matthews, 2018; Miller et al., 2018; Mokhtari & Reichard, 2002; Noddings, 2015; Oppong-Nuako et al., 2015; Robledo, 2015; Shanahan & Shanahan, 2008; Wendt, 2013; Willingham, 2008). Metacognition, being able to understand one’s own thought process, can help students better identify

what they know or what they don't understand which encourages critical thinking (Robledo, 2015; Willingham, 2008) and Mokhtari and Reichard (2002) agree stating, "Researchers investigating reading comprehension...have long recognized the importance of metacognition awareness in reading comprehension because it distinguishes between skilled and unskilled readers" (p. 249) and if students are unable to read deeply and think critically, then they remain surface readers who are unable to apply what they have learned (Fisher, 2009). Metacognition "is a crucial scaffold and precursor to improved learning" (Miller et al., 2018) and teachers can explicitly teach comprehension strategies that models and promotes higher-order questioning so students can learn to not only answer critical thinking questions but learn to ask their own (Englert, 1992; Johnson, 2018; Oppong-Nuako et al., 2015; Robledo, 2015; Shanahan & Shanahan, 2008) as "...it actually takes skill to come up with the right questions" (Robledo, 2015, p. 37).

The use of Costa's Levels of Questioning can help students learn to think deeply and critically. Arthur Costa (2011) (as cited in Johnson, 2018) has simplified the levels of cognitive difficulty defined by Benjamin Bloom. Costa has only three levels of questioning: 1) Easy: knowledge-level comprehension questions (answers can be found right in the text); 2) Medium: analysis-level questions; 3) Challenging: questions that involve application, synthesis, and evaluation. Teachers should explicitly teach students these levels and show them how to identify which level of question is being asked (p. 81). The exploration of these types of questions by the teacher and students creates a context for the development of domain specific knowledge and understanding (Flick,

1998) and such metacognitive strategies help “steer [a student’s] thoughts in more productive directions” (Willingham, 2008, p. 23). If a teacher explicitly teaches the use of these higher order questions and promotes their use during classroom activities that involve reading comprehension and academic discussions, then learning will improve. As Matthews (2015) states, “it is not easy to teach students how to think, ask questions, and reflect,...[but once students learn] to grasp what questions to ask...they [are] in possession of a powerful tool” (p. 78).

**Student-centered classrooms.** In recent decades, teachers have been encouraged to move instruction towards a more constructivist approach which means facilitating activities where students are engaged and actively constructing their own knowledge about the topic they are studying (Santrock, 2011; Tuyay et al., 1995). The idea that students should be active learners stems from the teachings of educational psychologist John Dewey; having learners seek out new experiences, ask probing questions, and solve problems is the epitome of being a critical thinker (Crawford, 1999; Robledo, 2015; Santrock, 2011) and Fisher (2009) believes that the goal of educators is to encourage thinking and improve academic achievement and the way to do this is “to create learning environments that facilitate engagement” (p. 175). One instructional method used to incite curiosity is called *inquiry* (Johnson, 2018) and over the past two decades, educational standards have increased their focus on the importance of inquiry-based learning (IBL) within the classroom (Crawford, 1999; Flick, 1998; Kang, Orgill, & Crippen, 2008; Levy et al., 2013; Oppong-Nuako et. al., 2015) but the belief is that “there seems to be an implicit assumption that [people know] exactly what *inquiry* is”

(Levy et al., 2013, p. 387). Crawford (1999) contends that many teachers mistake inquiry as “merely providing students with a series of hands-on activities” (p. 176). Even across disciplines, the definition of inquiry can differ (Levy et al., 2013) and research has shown that “implementations are [often] confined to particular curriculum areas” (Tuyay et al., 1995). For example, the National Research Council (2011) states in their framework for K-12 Science Education that students should engage in practices that mirror the type of investigating scientists employ in their field of study; in the National Standards for History, (as cited in the National Center for History in the Schools, 1996), students need to become proficient in analyzing historical documents and be able to evaluate sources to detect bias (Levy et al., 2013). The Council of Chief State School Officers (CCSSO) (2010) encourages students in their Common Core State Standards (CCSS) to engage in “inquiry, critical analysis, and dissemination of material in ways that are meaningful, realistic, and evidence-driven...[and the Standards also require students] to demonstrate independence, build content knowledge, and engage in critical thinking about new material” (Wendt, 2013). But disparities exist across subject areas as Levy et al., (2013) found that *inquiry* is more loosely defined in the English curriculum and that according to the National Governors Association Center for Best Practices (2010) the term *inquiry* only appears four times and only when connected to research—“thus, it seems, that the meaning of inquiry in English language arts has shifted over time from inquiry as writing and critical thinking to inquiry as research” (p. 397). If teachers are to implement inquiry-based learning within the classroom, it is essential that educators not only know what inquiry-based learning looks like, but also how to incorporate it into

their instruction (Crawford, 1999; Flick, 1998; Graham & Perin, 2007; Johnson, 2018; Kang et al., 2008; Levy et al., 2013; Miller et al., 2018; Oppong-Nuako et al., 2015; Shanahan & Shanahan, 2008; Tuyay et al., 1995; Willingham, 2008).

In a study conducted by Kang et al., (2008), 34 high school science teachers were asked to complete a survey created by the researchers to determine if teachers could identify characteristics of inquiry. Participants, from a large urban school district, were attending a summer institute to develop their knowledge and skill of teaching inquiry to improve science learning for underachieving students. First, teachers were asked to write a narrative describing an ideal inquiry lesson used in their classroom. Next, participants were asked to respond to an open-ended survey containing short teaching scenarios that focused on various inquiry activities. Teachers were then asked to respond yes or no if the scenario was an example of inquiry and to explain the reasoning behind their choice followed by a description of how each scenario could be modified to better reflect an inquiry-based model of learning. The study found that teachers are often confused about what inquiry looks like and that most teachers believe if a classroom is student-centered and students direct the activities, then it is characteristic of inquiry-based learning. However, the results further revealed that more emphasis is placed on student answers or conclusions rather than on the students' ability to formulate questions—which is a stronger characteristic of classroom inquiry (Englert, 1992; Johnson, 2018; Matthews, 2015; Oppong-Nuako et al., 2015; Robledo, 2015; Shanahan & Shanahan, 2008). Ultimately, Kang et al., (2008) determined that “teachers are more able to recognize an inquiry activity than to design or implement one” (p. 351).

One popular teacher misconception about inquiry is that it is separate from content, but in order for students to think critically, they need to have a strong foundational knowledge of content in the subject area being learned and they need to be able to ask and answer critical thinking questions related to content to further demonstrate their understanding of domain-specific material (Fisher, 2009; Johnson, 2018; Kang et al., 2008; Opong-Nuako et al., 2015; Tuyay et al., 1995; Wendt, 2013; Willingham, 2008). Since science education is leading the research and discussion on how to best clarify the nature of inquiry, Flick (1998) organized a panel presentation to review how the purposes, practices, and benefits of inquiry-oriented teaching could be made more clear since current “knowledge about inquiry teaching has developed more from the perspective of how students behave and what they experience than from how teachers generate and manage those experiences” (p. 4). The panel agrees that instruction and content should be more closely aligned and that teachers should explicitly teach inquiry strategies that students can practice and apply to other lessons. The ideal situation for any student in a content area classroom should be one in which the teacher models the inquiry process of a professional in their specific domain, like that of a scientist, historian, mathematician, or writer, and students mirror and use these same strategies in order to think critically and extend their learning about each subject area as they learn to draw their own conclusions (Flick, 1998; Levy et al., 2013; Miller et al., 2018; Opong-Nuako et al., 2015; Shanahan & Shanahan, 2008; Tuyay et al., 1995). Levy et al., (2013) argues, however, “that even when teachers do have strong



knowledge [of their domain and its] methods, they are not likely to teach their students how to use these methods” (p. 393).

Levy et al., (2013) shared insight into IBL using their own qualitative studies, each focusing on a different content area and each involving a different tradition of IBL. The study suggests that educators need to find a cross-disciplinary understanding of what inquiry is in order to successfully apply it to the classroom in support of student learning and engagement. When promoting IBL in the science classroom, author Kathryn Drago analyzed the discourse between curriculum designers and three middle-school science teachers as they shared feedback on how to improve IQWST (Investigating and Questioning the World Through Science and Technology), a project-based curriculum that each had piloted in an 8<sup>th</sup> grade chemistry classroom. The teachers identified various challenges, including the need to “[find] a balance between letting students explore phenomena yet skillfully guiding them toward building an understanding of cross-cutting concepts and core ideas in science” (p. 392), but in the science classroom, students often struggle with how to make sense of the data. Flick (1998) suggests that teachers should begin with laboratory experiments to promote inquiry-based learning as students connect scientific concepts with data collection. This shift will also encourage student discussion, which “is an essential—and often missing—element...[in] ‘inquiry-oriented instruction’” (p. 13) and not only will students build content knowledge, but discussion can also inspire future inquiries.

In the second study, author Brett Levy examined the historical inquiry methods used by preservice teachers during their coursework and student teaching seminars.

The author acknowledges that historical inquiry, compared to other disciplines, share some commonalities but is ultimately, “a distinct form of academic inquiry” (Levy et al., 2013, p. 394). Students in an IBL history classroom are tasked with facilitating activities that mirror those of an actual historian, but teachers often lack the required skills to do so. The study found that by observing, planning, and participating in historical inquiry lessons themselves, they gained a better understanding of its benefits and how to teach it.

Finally, author Ebony Elizabeth Thomas describes how English teachers in a professional development program inquire into their own pedagogy and practice in the hopes of developing a better understanding of the challenges and opportunities ELA educators face when it comes to inquiry. Thomas’ study focused on seven high school teachers who participated in professional development to learn about discourse analysis. The results indicate that there is a need for inquiry-based ELA teacher education and professional development that focuses on incorporating academic discussion and learning around diverse topics and ethical issues (Levy et al., 2013) which could further enhance student motivation and promote critical thinking.

Overall, all content-area teachers need to be prepared to engage their students in inquiry-based learning “not only *within*, but also *across* the disciplines...as today’s students not only need to know what counts as knowledge of a particular field, and how to demonstrate understanding within disparate fields, but also about how to integrate and synthesize knowledge in an interdisciplinary fashion *among* several fields at once” (Levy et al., 2013, p. 387).

**Inquiry-based classroom teaching.** When teachers can model critical thinking and encourage challenging conversations within the classroom, then students will be exposed to the type of thinking and analysis needed to support essential inquiry-based experiences and students would be better able to apply these inquiry skills to experiences outside of the classroom. Flick (1998) encourages teachers to decide what is to be learned through inquiry experiences and to clarify instructional goals for students. An inquiry-based learning environment “does not require an intensive analysis of, or differentiated instruction for every student...[instead]...nurturing, and developing students’ inner motivational resources” should be the goal and prioritizing “the students’ perspective during learning activities” is essential (Reeve, 2009, p. 147). According to Oppong-Nuako et al., (2015) “Learning and teaching environments can be described in terms of the presence or absence of inquiry, the amount or quantity of inquiry present, or the quality of the inquiry experience” (p. 198) and recognizes that “teaching both strategies and content at the same time is perhaps the greatest challenge for teachers in enacting inquiry-based instruction” (p. 201). The authors created a tool for teachers to use to measure the presence of inquiry in secondary classrooms. To do this, the study recognizes the work of Banchi and Bell (2008) that the extent of inquiry in classrooms exists across four levels: confirmation, structured, guided, and open. In confirmation inquiry, the teacher is the facilitator and students are given the questions and tasks to follow and complete in order to arrive at the known results/confirmed answer. In structured inquiry, students are given the questions and/or procedure to follow but are expected to produce their own explanations. With guided

inquiry, students are provided the questions, but are given more freedom in determining their own methods of learning and explanations with the teacher still assisting as needed—this is considered middle level inquiry. Open inquiry, one of the higher levels of inquiry, means the student is at the center of their learning and is given free reign over formulating their own questions to guide their thinking and research and in communicating their results. In order to measure inquiry-based teaching and learning, the study utilized, then modified, Llewellyn's (2004) *Rubric for Becoming an Inquiry-Based Teacher*, changing this "widely recognized tool" (Oppong-Nuako et al., 2015, p. 202) from a two-column checklist to a three-level rubric. Since the majority of research on inquiry in the classroom focuses on teachers and how they structure lessons and deliver content to better engage students, the authors of this study wanted to focus more on measuring student inquiry outcomes—how students perform in the classroom, how students process information, and how students demonstrate their learning. This study provides a practical tool, the *Three Level Rubric for Assessing Inquiry-Based Classroom Teaching*, for teachers to use to improve the inquiry experience in their classrooms—a solid step in the right direction to support student learning.

### **Collaboration**

One of the main goals in American education is to provide students with the best possible experience and to prepare them for continued education at the post-secondary level or for entering the workplace. Decisions must be made at the classroom level on how time will be allocated during instruction, and one of the most important skills that teachers can nurture and develop is the art of collaboration. Unfortunately, as students

move up into the secondary level, many content area teachers feel that delivering content should take a front seat due to time constraints and accountability issues involving state assessments which leaves less time for more student-centered activities and/or peer collaboration and discussion (Alvermann, 2002; Applebee & Langer, 2009; Ness, 2009; Ravitch, 2016; Robledo, 2015; Wendt, 2013). Johnson (2018), an assistant superintendent, once spent the day going through various high school classrooms as if he was a student and through his observations, found that in almost every classroom, teachers spent the majority of their instructional time delivering content and asking questions—with only a handful of the same students providing answers and spending days, weeks, or even months never interacting with their peers in a more meaningful way. Fisher (2009) experienced the same thing during his observations noting that approximately 17% of class time was geared towards classroom management and routines and discussion accounted for only 13% of class time. It was determined that instead of increasing student engagement and learning, “students [were] most often...passive recipients of content information...[and] were asked to listen and wait more than anything else” (Fisher, 2009, p. 173).

As conversations continue around best practice for improving high school graduation rates, and schools continue to focus on how to best prepare students for post-secondary educational success, there is a growing interest in how to effectively determine academic achievement. Previous measures include examining cognitive factors, socio-economic concerns, peer relationships among others. Parker (2004) conducted a study to examine the correlation between higher levels of social and

emotional competency and academic achievement in high school students ranging in age from 14 to 18 years. Participants, consisting of 667 students (304 males and 363 females), in grades 9-12, from a predominantly white high school in Huntsville, Alabama, were recruited and asked to complete the self-reported Youth Version of the BarOn Emotional Quotient Inventory in the spring of 2002. In June of the same year, the students' overall GPA was calculated based on the courses taken during the academic school year and three category levels were determined by academic achievement: top 20%, middle 60%, and bottom 20%. The results of the study show that "overall [Emotional Intelligence] EI was found to be a significant predictor of academic success" (p. 1327). As expected, students who perform better academically tend to have better interpersonal skills as the study found that "successful students scored higher on interpersonal abilities compared to less successful students" (p. 1328) which may correlate to better self-advocacy and communication with peers and teachers. But students need practice in strengthening their communication skills and by increasing the opportunity of peer collaboration within the classroom, academic learning also improves (Alvermann, 2002; Englert, 1992; Fisher, 2009; Graham & Harris, 1997; Graham & Perin, 2007; Johnson, 2018; Matthews, 2015; Noddings, 2015; Oponng-Nuako et al., 2015; Parker, 2004; Robledo, 2015; Strom, Hendon, Strom, & Wang, 2019; Tuyay et al., 1995; Wong, 1997).

## **Benefits of Collaboration**

When schools strive for creating successful students, they aim to establish clear goals around literacy instruction and stress that reading and writing should occur in all subject areas as a way to enhance learning and to promote literacy within the classroom, and teachers should consider all four components of effective literacy during instruction—reading, writing, listening, and speaking—which better prepares students for college and career opportunities (Miller et al., 2018; Snow & Moje, 2010). Bangert-Drowns et al. (2004) found significant improvement in learning achievement when students are given extended opportunities to write but only under certain conditions and evidence suggests “that self-reflective metacognition is more important than content-focused reflection and elaboration (p. 47). When students are encouraged to reflect on their understandings and share their confusions with their peers, it “yield[s] more positive effects” for the learner (p. 47). Learning is a collaborative and social activity and when students are given the opportunity to discuss their thinking and work with their peers, motivation increases, learning improves, and self-efficacy increases as students move towards being able to work independently (Alvermann, 2002; Bangert-Drowns et al., 2004; Englert, 1992; Fisher 2009; Graham & Perin, 2007; Harris et al., 2008; Strom et al., 2019; Tuyay et al., 1995; Wong, 1997).

Conversations are essential in creating a positive learning environment and when trying to create a community of learners. Parker (2004) found that there is a more diverse ability level in high schools when it comes to measuring intrapersonal skills (self-awareness, self-regulation, motivation, empathy). As a result, teachers may want to be

more intentional when providing opportunities for peer collaboration in order to improve and strengthen these essential life skills. The results from Parker (2004), show that “grade 9 students scored lower on the intrapersonal, interpersonal, and total scales than the other three groups (grade 10, 11 and 12 students)...[and] also scored significantly lower on the adaptability and stress management scales compared to grade 11 and grade 12 students” (p. 1327). As adolescents mature and gain more life experience, their communication skills will improve, and they will become more self-aware, but providing more opportunity for small group work in the classroom may strengthen these skills even more quickly.

There are many benefits to structuring a more student-centered classroom and providing increased opportunities for peer interaction. One important benefit is giving students practice in using domain-specific language and vocabulary which can increase student comprehension and learning—especially during peer-led discussions and writing workshops--as the student is able to make connections between important concepts and ideas and uncover areas of confusion or misunderstandings (Alvermann, 2002; Englert, 1992; Flick, 1998; Graham & Harris, 1997; Matthews, 2015; Noddings, 2015; Oppong-Nuako et al., 2015; Robledo, 2015; Strom et al., 2019; Tuyay et al., 1995). If teachers are willing to approach classroom learning as a collaborative effort, then maybe student motivation and engagement will increase which will lead to academic achievement.

**Tutorials.** Teachers often ask students to reflect on their learning during classroom instruction, and using strategies like Think/Pair/Share, Turn & Talks, Exit



Tickets, Summarizing, hand-signaling, journaling, etc. can be beneficial as it provides the teacher with a quick formative check for student understanding, but is there a more student-centered activity that can further guide student learning? One good way to assess understanding and learn material is to teach it. Most people believe they are good at assessing their own ability levels, and according to Robledo (2015) this is known as the Dunning-Kruger effect, in which “people who are more skilled will tend to underestimate their own abilities, whereas people who are less skilled will tend to overestimate their abilities (p. 20). It may be beneficial to seek feedback from others in order to truly check for understanding in a concept or idea. One of the most effective methods of assessing student comprehension or skill is through AVID’s Tutorial Process. During the tutorial process, students will have previously identified a point of confusion (POC)—a concept or idea they may be struggling with in relation to a topic being studied in a specific content-area. The student records their thinking on a form called the tutorial request form and describes the steps involved in relation to their topic/POC. Students are placed in groups of 7 or less and take turns presenting their POC (often using a whiteboard to show their thinking and notes. The student presents their POC until they reach a point where they need assistance from their peers. Students practice Costa’s Levels of Questioning as they ask the student presenter questions to guide the student presenter through the critical thinking process. All students take notes on the presentation which reinforces key concepts learned in class that can be later used for review. After the student clarifies their thinking on their POC, they write a summary of

what they learned as part of a reflection in understanding (Daws & Schiro, 2012; Matthews, 2015).

Teachers can use tutorials as an intervention as they are able to assess each completed tutorial request form to guide instruction as it will identify gaps in learning. Tutorials also allow students to practice language and vocabulary specific to each content area leading to improved comprehension; tutorials support peer collaboration and mirror how adults collaborate in the workplace as well as in the postsecondary academic setting (Matthews, 2015). This type of collaborative teaching and learning will provide a “strong foundation for students to apply inquiry to learning environments both inside and outside of the school setting” (Levy et al., 2013, p. 404). In addition, the tutorial process promotes critical thinking as it is connected to content and gives students practice with the skill of inquiry and question-making (Matthews, 2015; Oppong-Nuako et al., 2015; Willingham, 2008) and since metacognition is utilized, it gives students an opportunity to evaluate their own understanding or identify areas of confusion which will enhance domain-specific learning (Bangert-Drowns et al., 2004; Matthews, 2015; Miller et al., 2018). Pursuing inquiry is AVID’s greatest gift (Matthews, 2015) and tutorials help students navigate away from a fixed mindset as they learn that part of learning is admitting what you don’t know (Matthews, 2015; Robledo, 2015;). “In any case, an important point [to] remember is that no matter our skill level, there is always room for improvement” (Robledo, 2015, p. 21).

## Organization

Organizational skills are abilities that allow for successful people to stay focused, to utilize time efficiently, and to contribute to achieving one's desired goals. It is often assumed that these soft skills that prepare students for life outside of an academic setting have already been learned, but secondary teachers should never assume that students know how to be organized and successful, especially at the high school level (Bakunas & Holley, 2004). Often, in education, we prioritize the teaching of content and disregard opportunities to help students develop a good work ethic or strong organizational habits (Ravitch, 2016; Robledo, 2015). Learning how to be organized takes time, effort, and practice but is a critical skill that every student should be aware of and a skill that every teacher should instill in all learners in order to prepare them for success both inside and outside the classroom (Bakunas & Holley, 2004; Langberg, Epstein, Urbanowicz, Simon, & Graham, 2008; Matthews, 2015).

According to Bakunas and Holley (2004), teachers should “teach organizational skills in two broad categories: (a) organizing supplies, and (b) organizing behavior” (p. 92). Teachers often have many opportunities within the classroom to teach about the importance of various organizational skills, they just need to be more intentional about it. Often these moments are imbedded within standard classroom routines (like supply lists and/or course material set-up) and it's essential to make students aware of the fact that there is a structure and order to school and it requires students to behave a certain way inside of this academic setting—which is often “at odds with students' preferences and natural inclinations” (Reeve, 2009, p. 150). Certain behavioral issues can sometimes

cause students to miss important information which could negatively impact their academic learning (Langberg et al., 2008) but teachers can enforce and teach academic skills “to help them navigate and succeed in the school environment” (p. 408). Examples may include the physical organization of supplies such as the use of a book bag and/or binder to organize class material and the use of a planner to track assignments, homework, or other activities (Bakunas & Holley, 2004; Langer et al., 2008).

Langberg et al., (2008) conducted a study to determine if a homework management intervention program for children with ADHD could not only improve the organizational skills of students but ultimately enhance their academic performance as well. Students first worked with their counselors to establish an organized system for their bag, binder, and locker and were given organizational supplies to help them keep track of class materials and resources. An organizational checklist was used to track the students’ progress for the duration of the 8-week intervention program including at the 8-week follow-up appointment. Intervention specialists conducted a homework and planner check and received 55 minutes of intervention group time that focused on work completion and study skills. The results show that students improved their organizational skills when closely monitored during the 8-week program and dropped only slightly when students continued following the tenets of the program independently. Overall, their planning skills improved by 35% and their academic performance showed a small increase in overall GPA which indicates that organizational skills can and should be taught but more importantly, the “study suggests that relatively minor and targeted interventions, homework management and organizational skills,

have the potential to improve overall academic performance” (p. 415). Teachers should feel encouraged to take class time to teach students how to organize their supplies and could even model how to set-up each section of a binder that can be used to organize each class. Teachers can motivate students to take an active interest in staying organized since “by involving them, you increase the likelihood that they will comply” (Bakunas & Holley, 2004, p. 92). Teachers can even take it a step further by “allocating ten to fifteen minutes once a week for cleanup and reorganization” (p. 93) which may increase instruction time as many students will come to class prepared and ready to learn. Other organizational strategies such as color-coding materials by class and filing loose papers immediately will cause students less anxiety as it will cut down on potential missing work (Bakunas & Holley, 2004; Langer et al., 2008) which ultimately leads to improved academic achievement.

**Planners.** Just as it is important to teach students how to organize their supplies, teachers should also instruct students in how to organize their behavior. One way to do this is to encourage students to keep a daily agenda notebook/planner to record class assignments and due dates. Bakunas and Holley (2004) believe that "assignment notebooks are the foundation for any organizational effort" (p. 94) and are an organizational skill that all successful adults practice. Teachers can illustrate this point by sharing examples from their own life on how they stay organized and can further promote the benefits of organization by allowing class time to encourage students to record assignments or due dates on a consistent basis. To help with this, teachers can start with a daily spot-check of their completed agenda notebook and eventually taper

off, as "continuous checking followed by intermittent and then random monitoring will help create a long-term habit" (p. 94).

Planning is another life-long skill that will serve students well and is often one of the most important skills of all. Since many students will be assigned various long-term projects over the course of their academic career, teachers should take time at the start of each project to teach students about the planning process. The first step would be to introduce the project and explain its purpose. A whole-class discussion could take place that involves students in identifying the steps needed to complete the project as well as any important steps. Students should record and number the steps in their agenda notebooks so that important deadlines or due dates can be recorded as well. Finally, students should be taught how to create a tentative schedule that considers any unique scheduling conflicts a student may have that could jeopardize the timeline of the project. Bakunas and Holley (2004) believe that "the approach will result in improved motivation, which in turn will increase the likelihood that the project will be done on time [and] improved quality [will be] a natural by-product of the approach" (p. 94). Understanding the importance of planning and organizing is a critical first step in this skill base; providing practice during class "will help them transfer this crucial organizational skill to additional areas of their lives and make it a permanent feature of their behavioral repertoires" (p. 95).

**Note-taking.** Another skill that should fall under the task of the teacher is to explicitly teach students effective note-taking skills. When done right, note-taking helps "students to review, consolidate, and retain information" (Bangert-Drowns et al., 2004,

p. 31) and can have a profound effect on learning and academic achievement as it fosters retention and deepens learning (Bangert-Drowns et al., 2004; Gonzalez, 2018, September 9; Harris, 2014, February; Iris Center, 2020; Johnson, 2018; Matthews, 2015). Teachers often assume students know how to take notes, so they don't formally teach note-taking during school (Connelly, 2020; Gonzalez, 2018, September 9; Harris, 2014, February; Iris Center, 2020; Matthews, 2015), but "notetaking is a complex skill that many college students and adults fail to develop" (Bakunas & Holley, 2004, p. 93) and learning how to take focused notes is a skill that will serve students well into adulthood.

To begin, teachers should remind students that not every detail is important and should provide instruction that shows the difference between general and specific details (Bakunas & Holley, 2004; Connelly, 2020; Gonzalez, 2018, September 9; Harris, 2014, February; Iris Center, 2020). Teachers should encourage students to take notes on a consistent basis as sporadic note-taking will not reinforce good habits and if done consistently, students will have the added benefit of practicing their active listening skills which "will greatly improve [their] immediate learning [and support] full engagement with the content" (Connelly, 2020, p. 8). The key to successful note-taking is to have a good organization system which may include the following elements to aid in taking notes quickly and efficiently: date and label notes clearly; use abbreviations, keywords, and symbols—especially in classes with challenging vocabulary and/or technical language, create a key to help in condensing information, and allow time for review and to interact with your notes daily as part of your reflection process to check for understanding and review for upcoming assessments (Connelly, 2020; Gonzalez,

2018, September 9; Harris, 2014, February; Iris Center, 2020; Johnson, 2018; Robledo, 2015). Using the Cornell method of notetaking is encouraged as it is a straightforward way of organizing your notes, has been proven to be effective in emphasizing only the most important information or key details, and encourages critical thinking and engagement in the material, which helps students remember what they read (Connelly, 2020; Gonzalez, 2018, September 9; Johnson, 2018, Matthews, 2015). Teachers can also instruct students in how to properly set-up a Cornell-style note using their own paper by dividing it into three sections. The right side of the page is for taking notes; the section on the left is for writing down keywords, phrases, essential ideas, or questions for review or to record personal reactions/connections which encourages active listening and helps to further engage in the material (Connelly, 2020; Harris, 2014, February; Iris Center, 2020). Finally, the bottom section of the page is for the student to reflect on their learning by writing a summary which could be the most important task as it “will solidify your understanding of your notes and help cut them down further” (Connelly, 2020, p. 26).

Harris (2014, February) suggests further engaging with the notes by chunking the notes by topic, adding to the notes using sticky notes to clarify or paraphrase sections, creating visuals to capture main concepts, generating questions in the side margin to quiz yourself, including key vocabulary and definitions to support content area learning, and connecting your notes to an essential question to capture the purpose for that day’s learning. The key for teachers is to emphasize the importance of daily review of notes to support retention and reflection of material over time (Bangert-Drowns et al., 2004;



Gonzalez, 2018, September 9; Harris, 2014, February; Robledo, 2015). By interacting with your notes on a daily basis, you alleviate The Curve of Forgetting—a foundational rationale for effective notetaking created by Hermann Ebbinghaus which outlines the following guideline for effective note review: Day 1: review notes for 10 minutes and interact with them by chunking sections, writing questions, highlighting key concepts/ideas, etc.; Day 2-7: skim notes each day for five minutes and add to notes using post-its, draw visuals, paraphrase sections, and review with peers to identify gaps in learning; Day 7-30: continue to review and add notes; Day 30: Brain will commit information to long-term memory (Harris, 2014, February). If students interact daily with their notes, they will avoid knowledge loss; the retention rate continues to decrease over the course of the month when you don't review your notes--ending with only a 2-3% rate of retention (Harris, 2014, February).

The key for teachers is to provide ample opportunities to take notes, review and discuss them with a peer, and to add to notes when needed. Teaching students effective note-taking methods and study skills will support student learning and improve academic achievement (Alvermann, 2002; Bakunas & Holley, 2004; Bangert-Drowns et al., 2004; Connelly, 2020; Gillespie et al., 2014; Gonzalez, 2018; Graham & Harris, 1997; Harris, 2014, February; Iris Center, 2020; Johnson, 2018; Matthews, 2015; Mokhtari & Reichard, 2002; Noddings, 2015; Reeve, 2009). Helping students create order in their academic world will help them develop good organizational habits and teach them how to value order. "Order makes possible what is important in life and in education" (Noddings, 2015, p. 151).

## Reading

According to American College Testing (ACT), college readiness can be defined as “the level of achievement a student needs to be ready to enroll and succeed--without remediation--in credit-bearing first-year postsecondary courses” but less than a third of students graduating from high schools across the nation can even meet these minimum standards (Johnson, 2018, p. 1). Despite the need to prepare students for the demands of postsecondary education or success in the workforce, policy reforms are geared towards elementary schools and funds are funneled into literacy intervention programs rather than on supporting our older students at the middle or high school level (Alvermann, 2002; Johnson, 2018; Shanahan & Shanahan, 2008; Snow & Moje, 2010). This neglect in later literacy development, according to Snow and Moje (2010) is referred to as “the *inoculation fallacy* — the fallacy that an early vaccination of reading instruction protects permanently against reading failure” (p. 66) and that no further effort is needed to support more advanced reading skill (Shanahan & Shanahan, 2008).

This type of educational reform, while providing important intervention for struggling young readers, has done a great disservice to many of our older students who end up passing through high school with just adequate or basic literacy skill achievement (Alvermann, 2002; Shanahan & Shanahan, 2008) and data shows the impact it is having on our nation’s youth. According to the National Assessment of Educational Progress (NAEP 2007), scores have slightly increased for 4th graders, but have not improved at the 8<sup>th</sup> or 12th grade level; PISA (2003) finds that although U.S. children perform fairly well in international comparisons at the 4th grade level, their

ranking falls off sharply by 10th grade (Snow & Moje, 2010). In fact, according to the Department of Education (1999b) fewer than 3 percent of 8<sup>th</sup> grade students and fewer than 6 percent of grade 12 students can read at an advanced level (Alvermann, 2002).

### **Need for Advanced Literacy**

Teaching basic literacy skills may be sufficient at the grade school level, but in order to be successful in high school and beyond, students need to develop more advanced literacy skill and need to be able to not only read but be able to analyze and comprehend complex texts and be able to communicate effectively in meaningful ways (Alvermann, 2002; Barry, 2002; Johnson, 2018; Ness, 2009; Snow & Moje, 2015; Wendt, 2013). Fisher (2009) confirmed the lack of reading that occurs at the high school level when he observed students spending the majority of class time as passive learners; students rarely engaged with texts or their peers—instead, most reading assignments were completed outside of the class as homework. Many teachers have argued that pacing issues, curriculum concerns, and the demands of state standardized testing has caused them to prioritize content during instructional time (Alvermann, 2002; Barry, 2002; Gillespie et al., 2014; Ness, 2009; Stewart & O’Brien, 1989; Wendt, 2013) and indeed, many content area teachers are hesitant about having to teach reading comprehension as they believe they lack the training or even that it’s the job of the English teacher or reading specialist (Ness, 2009; Snow & Moje, 2010; Shanahan & Shanahan, 2008; Stewart & O’Brien, 1989; Wendt, 2013). It is this same lack of self-efficacy and motivation that our students most likely feel when faced with having to read and analyze complex texts within content-area classrooms, but Fisher (2009) states

that if students are not explicitly taught comprehension strategies during reading instruction, then students “remain surface readers who process a series of words but do not read deeply enough to develop the understanding necessary to apply what they learn” (p. 173).

To determine how often secondary teachers explicitly teach and incorporate reading comprehension strategies within routine classroom instruction, Ness (2009) conducted a study where researchers closely observed the instructional routines of four middle school teachers (two science and two social studies) and four high school teachers (two science and two social studies) at two public schools in rural Virginia. For the researcher to see evidence of reading comprehension instruction, the teacher not only had to explicitly teach the specific strategy to students and model it but also explain the strategy’s purpose and when it should be used. The results indicate that out of a total of 2,400 observable minutes of instruction, only 82 minutes (3%) of reading comprehension instruction occurred across all eight secondary classrooms. Even though the teachers understood the value of reading, very little explicit reading instruction or strategy use was evident in their classrooms. Ness (2009) believes many see it “as an instructional add-on, rather than a way to promote students’ understanding and retention of content” (p. 73). Since so many students enter high school lacking not only basic but more advanced reading skills, schools must align instructional time with the goals of literacy to improve academic achievement in content area literacy (Fisher, 2009) and it should be the goal of every teacher “to increase the precision with which

they teach, taking into account what students know, what they need to know, and how to use time to close the gap between the two” (p. 175).

**Strategy instruction.** In order to be effective, literacy instruction must address self-efficacy and engagement and teachers must ensure that students have appropriate background knowledge and practice employing strategies when reading a variety of texts to help them manage their own learning and comprehension (Alvermann, 2002; Bangert-Drowns et al., 2004; Englert, 1992; Fisher, 2009; Johnson, 2018; Miller et al., 2018; Mokhtari & Reichard, 2002; Oppong-Nuako et al., 2015; Reeve, 2009; Willingham, 2008). When explicitly teaching strategy instruction, the classroom becomes more inquiry-based and student learning outcomes improve (Miller et al., 2018) but if the goal is to increase students’ awareness of their use of reading comprehension strategies, then it would be beneficial for the teacher to get a baseline of what students know about their own comprehension processes when engaged with complex texts to better guide instruction. An inventory tool was created by researchers to assess the level of learner awareness when involved in reading and includes a revised list of 30 strategies that measure three comprehension factors used before, during, and after reading. These three factors include: Global Reading Strategies (13 pre-reading strategies geared towards a more generalized approach to reading); Problem-Solving Strategies (8 fix-it strategies that students can utilize when they have trouble navigating a text); and Support Reading Strategies (9 items that involve practical strategies that readers use both during and after reading). Mokhtari and Reichard (2002) believe this tool, called the MARS (Metacognitive Awareness of Reading Strategies Inventory) can be used by

teachers at the secondary level to check for reading strategy use as an instructional guide and/or intervention tool. The inventory can be administered to the whole class or to individual students within 10-15 minutes and when completed, students self-score based on the rating scale provided as they read and respond to each statement. A rubric is used to determine if and how often students use various reading strategies and scores fall into one of three categories: high, moderate, or low. Depending on a student's score, the MARSII could be a useful tool for both teacher and student as it brings awareness to the reading comprehension strategies used in content area classrooms and may indicate where more explicit teaching and modeling of more strategy instruction is needed. When attempting to teach strategy instruction, it is important that the teacher has an in-depth understanding of the strategies (Barry, 2002) since they are trying to steer a students' thinking in more productive directions in order to help them regulate their thoughts (Willingham, 2008).

**Domain-specific literacy.** Since the deeper thinking that needs to happen in content area classrooms involves asking more questions about *how* or *why* a text has specific meaning rather than asking surface level questions like *what* does the text mean (Alvermann, 2002) it would be beneficial to facilitate classroom discussions about various texts with the intent of gradually releasing students to practice this type of thinking independently (Englert, 1992; Miller et al., 2018). "Activities that model comprehension through discussion and that give students practice analyzing text, using academic language, formulating and critiquing arguments, and trying on perspectives get closer" to the more advanced literacy skills needed in domain-specific classrooms

(Snow & Moje, 2010, p. 67). Students should be given opportunities to discuss and collaborate with others as part of the critical thinking process when analyzing text. Teachers can encourage student interaction and discourse by asking a critical thinking question first, then allowing students to volunteer answers, building off each other's thinking to connect and make meaning from the text (Englert, 1992; Harris et al., 2008; Tuyay et al., 1995). Some teachers might question how this type of instructional approach could translate into other subject areas, since "texts in [other] content areas have different structures, language conventions, vocabularies, and criteria for comprehension" but Snow and Moje (2010) believe that even though adults would recognize these differences, adolescents don't and they would "benefit from being let in on the secret" (p. 67). Knowing that each subject area is organized differently, it is essential that content-area teachers not only understand their disciplines, including how to read and write—mirroring what professionals do in each subject area—but that they expose students to these unique literacy practices for their specific content area (Alvermann, 2002; Oppong-Nuako et al., 2015; Shanahan & Shanahan, 2008; Snow & Moje, 2010; Wendt, 2013). "It's shame that as a society, we often focus strictly on the content that is to be learned, rather than the process of learning itself" (Robledo, 2015, p. 4).

When asking students to engage in reading and analyzing domain specific texts, it is important to have them engage in multiple reads, sometimes for a different purpose, but just the act of reading and rereading is not enough to support comprehension or critical literacy. Shanahan and Shanahan (2008) wanted to determine the domain

specific reading strategies and skills needed for student success at the secondary level, so the study examined research conducted during the Carnegie literacy project which focuses on developing reading comprehension strategy instruction in the disciplines of Chemistry, History, and Mathematics. Teams were created for each discipline and consisted of two research experts (university professors), two experienced teacher educators who prepared preservice teachers, two high school teachers from diverse urban high schools in and around Chicago who taught in each discipline, and two literacy experts (authors). The goal of the three-year project was to first identify advanced appropriate reading skills to support each domain, help students to learn these skills, and finally implement them into urban high schools as well as teacher preparation programs. During the first year of the project, the team recognized how vastly different reading in each discipline was and determined a possible reading strategy focus for each area. In math, it is critical that students practice both close reading and rereading strategies as “math reading requires a precision of meaning” (p. 49) but unfortunately, students often read too quickly or skim the text to gain only a general understanding. Mathematicians must read closely in order to discover any possible errors, as their work must be error-free. The level of vocabulary used in texts was often challenging as words had both general and specific meaning that students would need to be able to decipher, and memorization of content-specific words was often the only way to gain understanding of each word’s meaning.

In chemistry, students must be able to understand various text structures/features and be able to make sense of and transfer information between “alternative



representations” (p. 49). Since chemists build knowledge through different forms of experimentation, reading about different processes first then having to transfer the information or visualize it would be a difficult task for students without explicit teaching of this skill. Just like math, domain-specific vocabulary can be challenging in chemistry, as it involves technical terms that are abstract and unfamiliar to the typical high school student.

The type of reading skill in history, however, involves assessing author/source credibility and understanding not only the author bias but recognizing reader bias as well. Most students are taught that information is factual, but really it is an interpretation made at a particular moment with sometimes an outdated view or understanding of the information. Historians must read critically, evaluate the source, and compare the information to other texts which is not how most students in high school history classes are taught. Instead, the focus is on building content area knowledge of events, people, and/or situations in order to be able to grasp the challenging vocabulary present in complex historical texts.

Teachers could support students’ reading comprehension by explicitly teaching students how to take effective notes that best supports their domain and how different styles of note-taking can be effective depending on its use and purpose (Bakunas & Holley, 2004; Gonzalez, 2018; Harris, 2014, February; Iris Center, 2020). Not all students know how to take effective notes so it should become part of the regular classroom routine (Bakunas & Holley, 2004; Gillespie et al., 2014; Gonzalez, 2018; Harris, 2014, February; Robledo, 2015). When focusing on improving the literacy skills of students in

chemistry, math, and history—domains usually devoid of explicit reading strategy instruction and/or practice—Shanahan and Shanahan (2008) suggest that the following note-taking methods be employed to support advanced reading strategies in each of the following content areas: **science**: structured summarization strategy was found to be useful: notetaking involving a graphic organizer used to summarize information learned but also supported content-specific elements/properties; **math**: mathematics structured notetaking involving three-column notes where students would record the “big idea” in the first column, the explanation/definition in the second column, and the third column would contain an example or visual to illustrate the “big idea.” The notes could then be used for review for tests. **History**: Strategy 1: history-events chart (note-taking) to answer the questions of who, what, when, where, why, and how in order to summarize the events. Students could then determine the relationships between events to establish likely connections (this strategy addresses a disciplinary problem in reading history). History strategy 2: multiple-gist strategy: students read a text and summarize it, then read another text and incorporate the first summary into the second summary, etc. Summaries must stay the same length and students must compare/contrast each summary using appropriate vocabulary.

There is a need for expanded literacy instruction in the upper grade levels but these literacy skills are difficult to master in high school because these skills are rarely taught in the disciplines—instead, teachers may focus more on general reading strategies--if they are taught at all (Alvermann, 2002; Shanahan & Shanahan, 2008; Snow & Moje, 2010; Wendt, 2013). This may be due to their over focus on teaching

content or due to their own lack of knowledge or skill in advanced reading comprehension instruction (Alvermann, 2002; Barry, 2002; Ness, 2009; Shanahan & Shanahan, 2008; Snow & Moje, 2010; Stewart & O'Brien, 1989). For schools to be successful, they need to emphasize literacy instruction, promote interventions, and encourage teacher professional development (Snow & Moje, 2010). "...As teachers, we should strive [to] better understand the thinking processes that support students' attempts to learn from texts...[and] increasing students' awareness of their comprehension process while reading is an important first step toward their becoming constructively responsive, strategic, and thoughtful readers" (Mokhtari & Reichard, 2002, p. 256).

## CHAPTER III: DISCUSSION AND SUMMARY

### Summary of Literature

The research has clearly shown that most high school students are not provided with extensive opportunities to read, write, or think critically in each of their content area classrooms, and this is due, in part, to schools prioritizing content over best practice, to lack of teacher training or knowledge, and to various misconceptions about the content area skills most needed by students to be successful in school and beyond (Alvermann, 2002; Applebee & Langer; Barry, 2002; Crawford, 1999; Fisher, 2009; Flick, 1998; Gillespie et al., 2014; Graham & Harris, 1997; Graham & Perin, 2007; Johnson, 2018; Kang et al., 2008; Levy et al., 2013; Miller et al., 2018; Ness, 2009; Robledo, 2015; Shanahan & Shanahan, 2008; Snow & Moje, 2010; Stewart & O'Brien, 1989; Troia, & Graham, 2003; Tuyay et al., 1995; Wendt, 2013; Wong, 1997). Too often, students are passive learners, and their achievement is measured solely by their ability to memorize facts, perform surface-level readings of a text, and complete perfunctory worksheet assignments (Alvermann, 2002; Fisher, 2009; Flick, 1998; Johnson, 2018; Kang et al., 2008; Levy et al., 2013; Miller et al., 2018; Ness, 2009; Oppong-Nuako et al., 2015; Shanahan & Shanahan, 2008; Snow & Moje, 2010; Robledo, 2015; Stewart & O'Brien, 1989; Wendt, 2013; Willingham, 2008).

Schools need to start providing more professional development opportunities for teachers that focus on the explicit teaching and modeling of strategy instruction, so teachers can promote advanced literacy skills within each content area classroom in order to support student learning and growth (Alvermann, 2002; Barry, 2002; Englert,

1992; Flick, 1998; Gonzalez, 2018, September 9; Graham & Perin, 2007; Harris, 2014, February; Harris et al., 2008; Johnson, 2018; Kang et al., 2008; Levy et al., 2013; Matthews, 2015; Miller et al., 2018; Mokhtari & Reichard, 2002; Ness, 2009; Oppong-Nuako et al., 2015; Shanahan & Shanahan, 2008; Snow & Moje, 2010; Stewart & O'Brien, 1989; Tuyay et al., 1995; Wendt, 2013; Willingham, 2008). Writing should take place across all domains and should be more frequent and purposeful. Students should be given opportunities to engage in more lengthy writing assignments where teachers can explicitly teach the writing process to better prepare students for the demands of post-secondary education (Alvermann, 2002; Applebee & Langer, 2009; Bangert-Drowns et al., 2004; Englert, 1992; Gillespie et al., 2014; Graham & Harris, 1997; Graham & Perin, 2007; Harris et al., 2008; Miller et al., 2018; Troia & Graham, 2003; Wong, 1997). When writing-to-learn activities are purposeful, they can clarify student understanding and help identify areas of confusion. Writing activities are essential as they reinforce the importance of organizational skills, promote peer collaboration, encourage various strategy usage, foster more independent thinking and learning, and demonstrate a students' ability to think critically (Alvermann, 2002; Applebee & Langer, 2009; Bakunas & Holley, 2004; Bangert-Drowns et al., 2004; Connelly, 2020; Englert, 1992; Gillespie et al., 2014; Graham & Harris, 1997; Graham & Perin, 2007; Harris et al., 2008; Matthews, 2015; Miller et al., 2018; Shanahan & Shanahan, 2008; Snow & Moje, 2010; Troia & Graham, 2003; Wong, 1997). Writing is learning and is interconnected with all the important skills needed to be successful in an academic and workplace setting.

While writing is essential and part of critical literacy, reading comprehension is also vital when it comes to domain-specific achievement and growth. There is an increased need for advanced literacy and reading skill within each of the domains as it supports a students' ability to think critically and communicate effectively, and when reading comprehension strategies are taught explicitly within each content area classroom, students become more motivated and confident, and their learning improves (Alvermann, 2002; Barry, 2002; Englert, 1992; Gillespie et al., 2014; Harris et al., 2008; Miller et al., 2018; Mokhtari & Reichard, 2002; Ness, 2009; Reeve, 2009; Shanahan & Shanahan, 2008; Snow & Moje, 2010; Stewart & O'Brien, 1989; Tuyay et al., 1995; Wendt, 2013; Willingham, 2008). Students need to be taught how to think and read critically in each discipline, but it can be challenging to implement within the classroom as it requires student awareness of metacognition, a solid foundation of domain-specific knowledge, and a student-centered learning environment (Alvermann, 2002; Bangert-Drowns et al., 2004; Crawford, 1999; Englert, 1992; Fisher, 2009; Flick, 1998; Johnson, 2018; Kang et al., 2008; Levy et al., 2013; Miller et al., 2018; Mokhtar & Reichard, 2002; Noddings, 2015; Oppong-Nuako et al., 2015; Ravitch, 2016; Reeve, 2009; Robledo, 2015; Santrock, 2011; Shanahan & Shanahan, 2008; Snow & Moje, 2010; Tuyay et al., 1995; Wendt, 2013; Willingham, 2008). Despite the challenge of creating an inquiry-based learning environment, teachers can model and explicitly teach higher-order questioning and provide students opportunities to practice critical thinking skills that extend student thinking and learning within each content-area classroom. When students are taught to read critically, engage in academic discussions, reflect on their learning, and ask higher-

order questions, student learning improves, and this will prepare them for life after high school (Alvermann, 2002; Bangert-Drowns et al., 2004; Crawford, 1999; Englert, 1992; Fisher, 2009; Flick, 1998; Gonzalez, 2018, September 9; Graham & Harris, 1997; Graham & Perin, 2007; Harris, 2014, February; Johnson, 2018; Kang et al., 2008; Levy et al., 2013; Matthews, 2015; Miller et al., 2018; Mokhtar & Reichard, 2002; Noddings, 2015; Oppong-Nuako et al., 2015; Parker, 2004; Ravitch, 2016; Reeve, 2009; Robledo, 2015; Shanahan & Shanahan, 2008; Snow & Moje, 2010; Strom et al., 2019; Tuyay et al., 1995; Wendt, 2013; Willingham, 2008).

How a student manages their behavior in school is also a key factor in determining academic and personal success. Learning how to become more organized is an important life skill and should be supported by teachers in the classroom. Targeted organizational interventions have shown to be effective, and teachers can start by requiring students to gather and organize their supplies. Encouraging students to use a binder and planner will increase a student's self-efficacy and support academic learning (Bakunas & Holley, 2004; Langberg et al., 2008). Another way that teachers can support academic literacy and promote organizational skills is through focused note-taking. When introducing note-taking strategies to students, teachers should explicitly model and teach the process of focused note-taking and encourage the use of class time for students to review and interact with their notes in order to reinforce the importance of this daily routine as it is a form of annotation that can directly support reading comprehension and critical thinking (Bakunas & Holley, 2004; Bangert-Drowns et al., 2004; Connelly, 2020; Gillespie et al., 2014; Gonzalez, 2018; Graham & Harris, 1997;

Harris, 2014, February; Iris Center, 2020, Johnson, 2018; Matthews, 2015; Ravitch, 2016; Robledo, 2015). Additionally, students should be shown how to interact with their notes daily in order to avoid retention loss (Bakunas & Holley; Connelly, 2020; Gonzalez, 2018, September 9; Iris Center, 2020; Harris, 2014, February). Allowing class time for students to add to their notes and reflect on their learning encourages critical thinking, promotes peer interaction and collaboration, and increases a students' self-efficacy, which can lead to improved academic achievement (Bakunas & Holley, 2004; Bangert-Drowns et al., 2004; Connelly, 2020; Gillespie et al., 2014; Gonzalez, 2018, September 9; Graham & Harris, 1997; Iris Center, 2020; Harris, 2014, February; Johnson, 2018; Matthews, 2015; Ravitch, 2016; Robledo, 2015).

### **Limitations of the Research**

To locate the literature for this thesis, searches of Educator's Reference Complete, Expanded Academic ASAP, Education Journals, ERIC, Academic Search Premier, EBSCO MegaFILE, and Google Scholar were conducted for publications from 1980-2020. This list was narrowed by using the research question to guide the review of published empirical studies from peer-reviewed journals that focused on the benefits of writing, reading, inquiry, collaboration, organization, and professional development within a secondary classroom setting. The initial keyword search included more broad terms and ideas related to WICOR and focused on the benefits for teachers and students within the context of a secondary classroom setting. Search terms such as "benefits of" precluded each of the keywords, and soon a more narrowed search was conducted focusing on search criteria that included: "high school," "inquiry-based



learning,” “peer interaction,” “content-area literacy,” “emotional intelligence,” “focused note-taking,” “academic achievement in high school,” “metacognitive awareness,” “goal-setting” “strategy Instruction,” “process writing,” “self-regulated strategy development,” “inquiry-oriented instruction,” “collaborative groups,” and “self-efficacy.” Chapter II was still organized using the five components of WICOR, and the sections were in the following order: Writing; Inquiry; Collaboration; Organization; and Reading. Based on my research question and the revised list of search parameters, the pool of available information was limited when it came to articles on the separate tenets of the WICOR strategies, specifically on the topics of organization and collaboration.

Articles dealing with organization were more superficial and focused on basic organizational skills, on students and/or teachers at the elementary school level, or on students with LD or behavioral issues like ADHD as a form of intervention. Studies on collaboration were usually flagged due to a keyword connection and were usually related to broader topics or activities—such as peer review in process writing or encouraging student voice for the purpose of building student equity within schools.

Research on writing interventions did not assess writing quality consistently, and there may be confusion on what constitutes a writing process/treatment. Most of the writing studies focused on English, and the need for research to include other domains is critical to accurately assess validity and outcomes--which may be skewed if teachers are not trained in writing assessment. Studies focused on informational writing mostly (which may not represent a student’s best writing), and the frequency and type of

teacher feedback were not measured clearly in writing interventions. Many studies include a sample of students with LD that could affect data on writing ability/assessment and most focused on intervention at the primary level rather than high school level.

When researching inquiry, there is a clear message that it is difficult to measure and much of the research collected is for elementary schools. Research on inquiry suggests establishing a learning community to support inquiry-based classroom learning—but no advice was given on how to do this—(one study was from 1998, which highlights the fact this is still an issue 22 years later). Finally, studies often focused on teachers and the reasons why they should incorporate inquiry-based learning but not how they should implement it.

### **Implications for Future Research**

Since most of the writing happens in an English language arts classroom, this is where most of the research is, but it would be beneficial to have more national data collected and examined for disciplinary literacy in order to assess the validity and outcomes of how to best incorporate writing in the disciplines. There was some mention of the benefits of vocabulary instruction on improving student writing, but not enough research exists currently. Research should include a comparison of different writing-to-learn activities that assess the quality of the activity. The research involving inquiry focused on teachers and the reasons why they should incorporate inquiry-based learning but not how they should—interesting that much of the research is outdated, which means this topic is still a concern for educators on how to implement inquiry

within the classroom. Very limited research on literacy instruction exists that focuses on high schools at the middle and high school level; very little research exists that measures metacognition, and much of the research is limited or unreliable. In addition, many of the studies suggest what a teacher should do to encourage metacognition, but they don't include practical ideas for how to implement these strategies. It would be beneficial to see exactly how teachers apply writing to learn activities in the classroom and find a more accurate way to measure the supposed success of such strategies. When trying to understand the inquiry-based learning model, it would be beneficial to have a clear definition and working model for how it would look and function in each content area.

### **Implications for Professional Application**

First and foremost, teachers need to understand that as educators, we need to be life-long learners who are always looking for ways to improve ourselves and our teaching methods—as education itself is in a constant state of change and revision. Overwhelmingly, the research pointed to a need for additional teacher training both at the preservice level and the inservice level, but opportunities need to be presented and structured in such a way to be most effective—especially for veteran teachers who already feel confident in their own instructional practices or new teachers who are often overwhelmed with navigating a new learning environment and managing classroom expectations. Trying something new can be daunting, but schools can alleviate this by structuring strong collaborative teams, providing practical professional development

opportunities, and encouraging peer observations for teachers to witness the impact of change.

First, teachers lack training for writing instruction and feel underprepared to teach and assess it—they need more professional development, but mostly in other content areas to support the demands of disciplinary literacy. Teachers are also hesitant to incorporate more writing within their classrooms, even if it is considered best practice. The solution may lie with compensation in the form of pay or additional prep time to assess student writing. District alignment of the curriculum is needed so that writing instruction at the middle school level includes the explicit teaching of strategies. If writing instruction was implemented across all content areas, it might improve the attitude that both teachers (and students) have towards it—it would not be as daunting to incorporate it, and teachers would have a common language they could use to support it. Writing instruction takes time to teach and involves extensive teacher training and class time to incorporate it (and assess it), but if content area teachers could see how it could be a vehicle for teaching content—maybe teachers could get past this to see how writing instruction can extend learning. Most teachers lack writing knowledge and skill (process writing but also other types of writing activities involving strategy use as well), but teachers who have had writing training claim it has helped them, so maybe there is hope yet.

Inquiry is less evident in English classrooms but can be incorporated into instruction with the right attitude, curriculum guides, and teacher support/training. In our building, English 9 and 10 have adopted a Pre-AP curriculum that has been

extremely successful for all learners. The principle focus of Pre-AP is on the following four categories that guide instruction: close reading and observation, evidenced-based writing, academic conversations, and higher-order questioning—all key components, coincidentally, that are tied to inquiry and WICOR strategies. The District could easily adopt this curriculum, but if this is an issue in some way, the framework can be used to guide future instructional practice at the building or even teacher level. Inquiry curricula exists, but it tends to support science more than history or ELA—teachers must design their own inquiry-oriented instruction, so more training on this across the district would be useful. AVID's use of explicitly teaching Costa's levels of Questioning can be used to support inquiry (and is also easy to implement and supports the teaching of metacognition to students--how to learn and how to think about their thinking).

Teachers often see content as separate from inquiry, but available research suggests that it is not years of experience that determines the level of inquiry-based instruction, but how one approaches teaching and learning in the classroom—it's all about the attitude and the approach to making a classroom more student-centered which naturally invites inquiry to take place more easily. There also needs to be a common language developed between content-area teachers to teach inquiry—could there be similar strategies too that are shared among teachers?

More teacher training is need on student-centered discussions and how ELA teachers, specifically, can center the academic discussion around diverse topics and ethical issues. The idea that teachers across disciplines could work together to create inquiry-based projects is an excellent one, but could be hindered by content, pacing

issues, and teacher interest. Learning more about how to create a learning community and collaboration w/ outside professionals would be interesting as well and could support domain-specific literacy challenges within the classroom.

Secondary educators still consider the English teacher to be the sole provider of reading instruction, but if we take a top-down approach, and get experienced teachers trained in advanced literacy skills and learn more explicit strategy instruction—where you teach a strategy, explain it, but also provide a purpose for using it--then collaborative teams could more easily see the benefits of it working in the classroom and others could observe for training purposes. Finally, the quality and frequency of training are needed for literacy instruction as it requires sophisticated skills, thoughtful instructional practices, discussion-based instruction, and domain knowledge; and training could solve the confusion teachers experience about what literacy instruction involves beyond reading and language.

### **Conclusion**

Just as teacher education programs emphasize a need for reading and writing comprehension instruction, professional development must do the same for in-service teachers. The educational demands required of in-service teachers can be daunting, so it is vital teachers are provided with an opportunity for meaningful professional development, including mentoring and coaching, to allow them to see the realm of possibilities within the learning community. The whole idea that teachers never stop learning is what drove me to embrace the tenets of WICOR, and it is what drives me to promote its benefits to my colleagues in the hope that it can move teachers beyond

teaching “content” to using their content area to teach critical thinking skills and promote life-long learning skills.

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