ThinkUp!
ELAR

™

Supporting documentation for the development of **ThinkUp! ELAR**

ThinkUp! ELAR

Reading, writing, and associated literacy skills are essential in achieving success in any subject as well as functioning in the real world. According to international literacy rankings, the United States appears to be lagging behind other countries. Based on the 2016 Progress in International Reading Literacy (PIRLS) Study 8 report (IES/NCES, 2017), the United States' world ranking dropped from fifth to 13th. Specific details and statistics about the results are reported on IES/NCES website and summarized by Carr (2017).

PIRLS is an assessment given to fourth-graders around the world every five years to measure student learning in reading. This comparative assessment provides information on how the skills and reading knowledge of fourth graders in the United States compare with fourth graders from other countries. Students are provided narrative fiction texts to assess their abilities to read for literary experiences along with informational texts to measure their abilities to acquire and use information while reading. The reading texts contain open-ended and multiple-choice format questions about the texts. In addition, questionnaires are administered to teachers and principals of the tested students to gather information about school experiences and teaching practices in developing reading literacy for the tested students.

Peggy Carr (2017) highlighted results on the PIRLS and ePIRLS in the PowerPoint *Highlights from the Progress in International Reading Literacy Study (PIRLS) and ePIRLS: 2016*. International results for PIRLS show twelve systems scoring higher than the United States, fifteen systems scored the same, and thirty systems scored lower. In 2016,

a new assessment was given to measure online reading skills and competencies titled ePIRLS. The purpose was to assess students' approaches to informational reading in an online environment. International results for ePIRLS show that three education systems scored higher than the United States, two systems scored the same, and ten depicted lower scores.

Results such as these demonstrate some of the reasons why a high priority is placed on literacy development for schools and why quality resources are necessary in instructional offerings for English Language Arts/Reading classrooms across the nation. In the development of *ThinkUp! ELAR*, Mentoring Minds provides resources for students and teachers to promote the development of literacy skills in Texas schools. These tools build confidence and stamina as students comprehend and analyze literary and informational texts and respond using a variety of formats that mirror testing situations. In addition, students practice language skills and make reading-writing connections as they complete the unit components and the Performance Task Assessments.

ThinkUp! ELAR is offered as a core curriculum that is founded on critical thinking and the instruction of 100% of the new ELAR TEKS. The purpose is to build students who are thinkers—not test takers; therefore, the content was not developed to be test prep. Critical thinking skills are essential for students to succeed, not only in their schoolwork but also in their life after graduation. For students to meet state content standards, they must be able to critically examine information. After graduation, the ability to think and adapt will stand them in good stead in college and in their careers. Albert

Einstein stated that education "is not the learning of the facts, but the training of the mind to think" (as cited in Frank, 1947, p. 185). Similarly, Margaret Mead (n.d.) commented, "Children must be taught *how to think,* not what to think." Educators have an opportunity and a responsibility to equip students with the critical thinking skills and thinking traits that can help them organize thinking and transfer learning to new situations. Based on the Gradual Release of Responsibility Model (Pearson and Gallagher 1983; Fisher and Frey, 2013), ThinkUp! ELAR leads the teacher to provide appropriate instruction prior to guiding the student to independent practice and application.

ThinkUp! ELAR is a comprehensive, rigorous, and relevant supplemental English Language Arts/ Reading resource developed by Texas educators to integrate focused reinforcement into ELAR instruction. The development of this resource was based on the English and Spanish Language Arts/Reading TEKS (TEA, 2017) that were adopted in 2017 and intended to be implemented in Kindergarten – Eighth Grade classrooms beginning with the 2019-2020 school year. This resource is designed to develop and improve students' reading, writing, listening, speaking and research skills. With a unique emphasis on critical thinking in the classroom, students are empowered to extend and apply learning beyond the classroom.

ThinkUp! ELAR units are aligned with the genres of texts required by the TEKS. Students must display a beyond literal understanding of texts as they exhibit critical and inferential skills. Students must also show sufficient skill in forming connections within and across texts, using evidence to justify or form conclusions and make real-life applications. Each unit includes components that represent the STAAR® requirements of developing rigor and complexity of thought to move students forward in mastering the existing Reading Standards.

Charles Fuhrken (2009), a member of the ELA/R Product Development Team at Mentoring Minds and a leader in the assessment field, conducted numerous training sessions with the team on the development of assessment items. Fuhrken continually informs the ELA/R team on any new developments in the reading arena. Updates for reading assessments presented at several conferences, Texas Elementary Principals and Supervisors Association (TEPSA), Texas Assessment Conference (TAC), and Coalition of Reading and English Supervisors of Texas (CREST) were also considered while developing *ThinkUp! ELAR*. In addition, a reading training session, an article, and continual updates by Victoria Young (2017; 2018) keep the ELAR Product Development Team at Mentoring Minds abreast of current ELAR information. Previously, Young served in the Student Assessment Division at the Texas Education Agency from 1988 to 2015 as the Director of Reading, Writing, and Social Studies Assessments. She is a content expert assisting the National Assessment Governing Board in its development of new achievement levels (national standards) for the grade 4 NAEP writing assessment, while continuing to provide professional development on how literacy can lead to academic success of all students.

Two key areas in preparing students for college and career readiness are critical thinking and problem-solving skills (MetLife, 2011; Achieve, 2015). Based on an examination of top-performing global educational systems, a key identifier of successful systems is rigor (Ripley, 2013). Schools have been criticized for not adequately preparing students for the level of rigor they will encounter in college (Achieve, 2006). In 2011, only 25% of high school graduates taking the ACT successfully passed all four of the ACT's College Readiness Benchmarks, and 28% of high school students did

not pass any of them. ACT predictions have been confirmed: nearly one third of students entering post-secondary education take remedial courses in one or more subjects because they lack the skills to take standard credit-bearing courses (National Center for Education Statistics, 2011). Moreover, research into the success rates of college students and high school seniors has shown that students' level of critical thinking is predictive of their grades or cumulative college grade point average (Facione, 1990a, 1990b; Sternberg, 2008).

In terms of employment, an overwhelming percentage of employers (93%) have indicated that job candidates' capacity to think critically, communicate clearly, and solve complex problems is more important than their college major (Association of American Colleges and Universities, 2013). When asked in 2015 how American public high schools could do a better job of preparing students for the expectations of college and the working world, college instructors and employers emphasized the need for critical thinking and problem-solving skills. This is especially true today, where new knowledge is rapidly accelerating, and information is instantly available. Students with critical thinking and problem-solving skills can interpret and evaluate what they read, see, and hear to effectively make the transition to college and career.

Educators, parents, and community members also agree that critical thinking and problem-solving skills are important skills for students. The findings of the Project Tomorrow (2014), a survey of district administrators, teachers, parents, and community members, show critical thinking and problem-solving skills as essential skills needed by students for future success. As previously indicated, there is a connection between critical thinking skills and success in life—not just in college and the workplace. Research has found that adults who

scored higher on critical thinking assessments reported fewer negative life events. Possessing critical thinking skills helped the participants make positive life choices (de Bruin, Parker & Fischoff, 2007). This is echoed by Nisbett (2016), who states, "Schools cannot claim to prepare students for life unless they help students learn to reason effectively and to make choices that will improve their lives and the lives of others" (p. 28).

Encouraging and fostering thinking is central to student learning. In education, a shift from a focus on content to an emphasis on thinking skills is apparent. Thinking must be integrated with content to make meaning and deepen learning. Costa and Kallick (2009, p. 5) state that the standards "suggest that successful instruction in skillful thinking should be done *while* teaching subject matter instead of *in addition to* teaching subject matter. Thinking and subject matter content are neither separate from nor in opposition to each other. The implication is that a student cannot demonstrate mastery of any of these required standards without performing one or more important thinking skills." Thus, the resource *ThinkUp! ELAR* emphasizes focused content that addresses a TEKS or multiple related TEKS while promoting deeper learning, encouraging students to share evidence or reasoning for solutions—a vital part of any ELAR curriculum—rather than simply providing facts or a single answer.

Students should be taught the importance of thinking critically and how critical thinking skills impact their future success. It is recommended that students be taught that improvement in thinking skills is like improvement in any sport or hobby. Emphasize that the development of thinking takes commitment as well as practice, practice, practice. Students must also understand that learning how to think critically develops and improves over time. With ThinkUp! ELAR, teachers can ensure that

students know the purpose or the reason behind every learning experience, so the focus remains on the learning itself and not the work. Stobaugh (2013b, p. 137) states, "By establishing a focus on thinking, teachers can transform classrooms from mass-production classrooms with students able to answer fact-based questions to classrooms that embody real learning through thinking as students analyze, critique, and create."

Expectations should be clear and communicated to students so they know that learning is more than the acquisition of information and skill, and that discussions are not merely superficial. Only then will students understand what a thinking classroom looks like. Classroom tasks, routines, and assessments will make it transparent that in-depth thinking is required for success. Higher-order questions (e.g., Why is ___? What are you assuming when you say ___? What evidence can you offer to support ___? How might ___?) and thoughtful responses are desired. Students will readily observe that tasks, routines, and assessments are designed to elicit thinking and to transfer and make meaning. *ThinkUp! ELAR* translates thinking from content-area instruction into a wide variety of situations and allows students to see relevance. Thinking expectations enable individuals to effectively evaluate the quality of thinking of others and self-assess their own thinking, determining individual progress and the improvement needed. When expectations for thinking are made explicit, evidence can be gathered, and judgments can be formed (Paul & Elder, 2000). With the emphasis on learning and thinking at the core of instruction within a school, the focus of the classroom shifts from acquisition of content to making meaning.

Teachers must be specific in making expectations explicit for a thinking classroom if they want students to participate and succeed in a thinking environment. ELAR classrooms can be work

cultures or thinking cultures. In work cultures, an emphasis is placed on students completing assignments, often at a low cognitive level. Thinking cultures nurture students' thinking skills (Ritchhart, 2002). Stobaugh (2013a) notes that teachers can train brains in a "thought-full" classroom just as people visit a gym to train their bodies to be stronger and more agile. Classrooms should encourage student questions and inquiries that focus on higher-order thinking and deepen learning experiences. *ThinkUp! ELAR* emphasizes a thinking climate and clarifies learning targets in each unit so expectations are explicit, and students know they will be active learners.

State standards pave the direction for classroom instruction. Evidence of critical thinking is woven throughout the standards and the concepts required for each content area. At every grade level, all students must be taught to think critically and display behaviors that show that growth is being made in this arena. The problem that so many educators face is the "how." *How* do we teach students to become critical thinkers? *How* do we integrate that into the curriculum we teach? *How* do we assess that thinking is occurring? *How* do we guide students to share the responsibility in thinking critically? These questions and more appear to be a reality for school leaders and teachers. So, where do educators begin and what precisely do they teach when it comes to critical thinking? Some educators indicate they are ill prepared and do not know where to turn. Time is of the essence in today's classrooms so quality resources that guide teachers are imperative. The solution offered by Mentoring Minds—*ThinkUp! ELAR* equips teachers with tools they need. Teachers are provided support in understanding and interpreting the new TEKS with research-based thinking and instructional strategies through a unit section titled, Clarifying the TEKS.

Teachers are also offered support in integrating critical thinking that is infused into each unit in the resource.

Beyond acquisition of skills and creation of a culture that promotes thinking, there is another consideration that can impact deeper thinking—students should become aware of and learn to apply attributes or behaviors that strong thinkers exhibit. Research indicates there are specific behaviors that high-quality thinkers demonstrate. Effective thinkers and high-performing individuals do appear to portray certain characteristics (Goleman, 1995; Perkins, 1991). Costa and Kallick (2008, p.16) report there are certain characteristics that successful individuals "such as lawyers, mechanics, teachers, entrepreneurs, salespeople, physicians, athletes, entertainers, leaders, parents, scientists, artists, and mathematicians" tend to exhibit when faced with solving problems. They define these identifiable characteristics as "habits of mind."

In 2017, a team of educators from Mentoring Minds generated a list of traits they have observed throughout their education careers that were indicative of students who exhibited skillful thinking and deeper levels of thought. Based on their varied backgrounds of teaching and leadership experiences, elementary and secondary levels of curricula expertise, a range of 5–38 years working with children, observations of students, conversations with teachers, and 7 months of focused discussions, careful study, and deliberation, these educators collaboratively narrowed their lists to nine behaviors that students exhibited more times than not when thinking critically. Collectively, these nine behaviors (adapt, collaborate, communicate, create, examine, inquire, link, reflect, and strive) were entitled *9 Traits of Critical Thinking™ (Mentoring Minds, 2017).* The nine traits, when explicitly taught, modeled,

and practiced, can guide students in becoming more successful when engaging in cognitively demanding tasks and in social interactions at school and in life beyond the classroom. The traits should be emphasized in context with content-specific learning experiences that align to a trait during instruction. Focus for the 9 Traits of Critical Thinking is featured in the teacher edition and in the student edition. To understand the trait, the development outcomes and prompts that teachers might use to determine if students are exhibiting the traits are offered. Strategies for explicitly teaching the traits are also shared. Students are also provided information in the student edition stating the expectations for each trait focused within the unit and are provided reflection opportunities to assess how they use and apply the focus trait(s) in each unit. The traits help students become increasingly aware of thinking and more alert to mindful behaviors they can internalize.

A featured visual or icon depicts each of the *9 Traits of Critical Thinking™* in *ThinkUp! ELAR*. These traits are integrated into unit instruction using any combination of traits. A unit's focus traits may differ since any combination or any order of traits can be accented. Although three are focused upon in each unit in *ThinkUp! ELAR*, other traits could also be impacted if the teacher so desired. Traits were selected according to the type of thinking required by the activities designed for students. By developing the nine traits in students and integrating the traits into the curriculum, teachers can impact student success in thinking and learning. The identified critical thinking traits are basic to all learning at all levels and in all subject areas. Each trait contributes to the creation of a thoughtful environment that supports the development of skillful thinking. The information surrounding each trait helps teachers as they

model, support, and monitor trait development. The intent is to nurture trait development across the curriculum to help students internalize and display all nine traits whenever thinking in academics, social interactions, or other situations warrant.

When students are guided to practice better thinking in school and in their daily lives, they will become more successful in cognitive-demanding tasks and learn to value thinking throughout their lives. Practice and skillful application of each trait can result in students' actions becoming more productive and automatic when they encounter unknown or challenging situations in the classroom and in the real world. Learning how to think equips students with the ability to navigate challenging life circumstances. Throughout *ThinkUp! ELAR*, the traits are integrated into the instruction of the standard or concept. During ELAR instruction, each unit promotes a productive critical thinking climate with students being aware of their growth to become better thinkers.

According to the Organization of Economic Co-operation and Development (2013), many adults in the U.S. lack the literacy skills needed to negotiate work and everyday life. Overall, the literacy rates of American adults are below the international average. Approximately 30 million American adults are unable to read and comprehend a newspaper article, while another 27 million cannot follow map directions due to a lack of literacy skills required to understand and use the documents (Kutner et al., 2007). These limited skills result in higher levels of unemployment and lower wages. The community is impacted by lost taxes, increased demand for social services, and perhaps low participation at voting time (Jerald, 2009). However, it does appear that American students are skilled at reading literature. The National Center for Education Statistics (2012) report that American fourth-graders are outperformed by Finland's students by

significant margins on international assessments of reading for "literary experience" based on the 2011 Progress in International Reading Literacy Study. It is important to note that the performance of fourth graders in the United States do dip behind four other countries due to informational reading. Reportedly teens in the United States appear to use the skills of reflect and evaluate when reading fiction and poetry with only five nations performing better; however, when acquiring and using information from written text, the 2009 PISA reports that the teens are behind 14 other countries.

ThinkUp! ELAR supports using texts and a wider range of strategies for a variety of purposes. Teachers are encouraged to introduce varied forms of written content and additional reading across the curriculum. America's schools are charged with equipping students with the literacy skills they need to succeed school and in life. Teaching informational texts along with literary texts provides students essential cross-curricular applications in acquiring critical comprehension strategies in subjects with real-world content. Skill-based literature book titles are provided in each grade-level teacher edition that support instruction of specific concepts and skills for ELAR. While this offering is categorized by concept/skill, many of the titles would support the teaching of multiple concepts/skills. The titles may be used for direct instruction in the form of Read-Alouds, mini lessons, or targeted practice to support the teaching of concepts/skills within context. Coding noted on the titles reflects the Lexile measures as analyzed by MetaMetrics®. Within each unit, Literature Connections reinforce the topic of that unit and the performance task.

Marzano (2009) stressed the importance of a common language as it provides a framework or a way to talk about instruction at school. Just as educators use a shared language to discuss

effective instruction in order to improve student learning, it stands to reason that to converse about critical thinking and its development, a language common to all should also exist. According to Walsh and Sattes, "A language of thinking promotes exactness and precision in expressing cognitive processing" (2011, p. 144). When a shared understanding is developed based on the common language of critical thinking, teachers can engage in deliberate conversations to make real-time adjustments in planning and engaging students in meaningful thinking experiences. By developing this knowledge base, teachers are given opportunities to improve their expertise in thinking and to better understand the kinds of practice opportunities needed to help students grow as independent thinkers. Thus, *ThinkUp! ELAR* highlights developing a common thinking language about the nine critical thinking traits throughout each unit. Valuing a common language can ripple among the school community, causing all stakeholders (students, teachers, school leaders, parents, community leaders) to speak and understand the same thinking language.

An extensive review of research indicates effective vocabulary instruction allows for both incidental and planned experiences (National Reading Panel, 2000). The notion that students will learn the necessary vocabulary by chance is merely an assumption. A word that is not part of a student's oral vocabulary causes difficulty in grasping the meaning of what the student is reading. All students need and benefit from direct vocabulary instruction (Gunning, 2003; Vacca et al., 2003). A variety of strategies for acquiring new vocabulary and extending the depth of vocabulary learning should be employed. Stahl and Fairbanks (1986) reported findings of effective methods, based on meta-analysis of vocabulary studies, that result in comprehension of word meaning which are

supported by other researchers. Encountering the vocabulary frequently to deepen the meaning is a finding upheld by Beck, McKeown and Kucan (2002) and Nagy (2005). Within each unit, text-specific vocabulary and TEKS vocabulary are featured. Vocabulary activities are offered in the Teacher Edition that develop or reinforce essential vocabulary. A separate section for glossary support at each grade level is included in the back of the teacher and student editions so that teachers can guide students to build the academic background knowledge they need to fully understand content.

Acknowledging the needs of the user is crucial in designing educational products that are effective in improving teacher and student performance, resulting in academic achievement. Recognizing this acknowledgement, the ELA Product Development Team at Mentoring Minds acted to gather input. An online reading and writing survey was administered in January 2017. Respondents were Texas administrators, principals, assistant principals, teachers, and curriculum and instruction users who had purchased a previously written ELA product in the past 18 months. An email with a SurveyMonkey link was sent to 3,927 users with 192 or 5% returned. The purpose of the survey was to collect user and buyer feedback around the previously purchased STAAR Total Motivation Reading and Writing resources to inform the product revisions for a new ELAR product that would be released after the new ELAR TEKS were finalized, approved, and made public. Feedback was solicited for the teacher and student editions involving the print and online resources. Respondents had the opportunity to comment on what they liked in the resources as well as opportunities to rank the importance or the use of components. Survey respondents provided feedback on the format or layout and what attracted them to the resource. In addition,

open-ended responses were solicited on how the teacher edition was used. Respondents were also invited to offer input for future improvement. Upon receipt of surveys, the data was summarized into charts and narrative input for internal use by Mentoring Minds ELAR Product Development Team. The ELAR Managing Editor facilitated an analysis of the input to determine how the data would be used to inform the new product *ThinkUp! ELAR.* According to the survey (January/February 2017), findings revealed that educators do have opinions and view many elements as essential to ELA resources, including critical thinking, alignment to and support for understanding the standards, content written with rigor, vocabulary building, literature connected to text, instructional and intervention activities, and extension opportunities.

In September of 2018 another opportunity was extended by Mentoring Minds to glean information from educators. An ELAR Focus Group, comprised of teachers and administrators currently using Total Motivation Reading, assembled in east Texas to preview and to provide feedback about the design and content of *Team ThinkUp!* and *ThinkUp! ELAR*. Insight garnered from this meeting indicated that educators approved of the focus on critical thinking and how it was taught but were unsure if funding would be available for purchasing the product. In regard to *ThinkUp! ELAR*, educators appeared pleased about the new texts and added components such as Guided Instruction. All observations and comments yielded favorable results that the new TEKS were being addressed with an all-new product design. A follow-up meeting with an emphasis on ELAR teachers in elementary and middle school—a group of 7 across grades—focused their attention on the design of the teacher edition. A walk-through of each component—the purpose/rationale/format/content—was shared. Feedback was solicited about using the features and/or components

efficiently. Prior to the follow-up meeting, each attendee was provided questions along with a grade 4 student and teacher edition unit for review.

- What questions do you have about the content on the teacher edition pages?
- How does the teacher edition support the implementation of the student edition content?
- What components of the teacher edition are most helpful in planning and implementing instruction?
- What makes the teacher edition user-friendly/accessible and what suggestions do you have to make improve its usefulness/accessibility?
- Does the teacher edition support professional learning of the new TEKS and their implementation?

During the meeting the questions were discussed, and feedback recorded. The responses were used to adjust and improve *ThinkUp! ELAR,* the resource currently in development. Mentoring Minds advocates that gathering input of the customers *and* using the input to inform the development of higher-quality resources must be a continual part of the development process.

Student success seems to hinge on teacher practices. Rice (2003) states that teacher quality has a strong tie to student achievement. Formative assessment will help teachers make more targeted adjustments and increase responsive adjustments and interventions based on student needs. One important function of formative assessment is to inform instruction. Suggestions throughout the teacher edition are shared to guide teachers in what to look for when observing or instructing students as well as what the expectations are for students regarding acquisition of trait development. Offering formative feedback to students from teachers, from peers, and through self-assessment improves quality of thought. According to (Black et al., 2003)

formative assessment contributes to achievement of standards and intervention support. The incorporation of formative assessment is essential because it improves teaching and learning. Several researchers indicate the difference that can be made when formative assessment is embedded into instruction (Darling-Hammond, 2004; Marzano, 2003, 2006; Shepard, 2000; Heritage, 2007).

Building and checking for concept and trait development is emphasized throughout the units. This is essential as results based on the National Assessment of Educational Progress (NAEP) show that many students are not mastering the skills needed when interacting with texts. While there are reported reading gains, still one-third of tested fourth graders score below the basic level of reading as measured by NAEP. This means they have not achieved mastery of locating relevant information, making basic inferences, identifying details that support interpretations or conclusions (NCES, 2014; NCES, 2013b). Although eighth-graders perform better, one in five still scores below the basic level.

The most powerful way to raise student achievement is through professional learning. More than ever before, students need effective instruction in order to develop the deeper thinking skills needed for school and later in life. Research shows that teachers need on-the-job support to infuse ideas into daily instructional practices (Joyce and Showers, 2002). The need for professional development to focus on instruction is based on the assumption that the quality of instruction is the key determinant of variation in student achievement (Wenglinsky, 2000; Hattie, 2009). Teachers must understand the role thinking plays and their responsibilities in making thinking a core element across the curriculum. Therefore, the teacher edition contains information to assist teachers in providing necessary support

to establish a thinking culture. Questions are provided that can be used to promote instructional conversations among teachers, between teachers and students, and among students to stimulate thinking conversations. Each section in the Teacher Edition (Getting Started, Instruction, Assessment, Extension, Extension/Reflection) offers a description and direction to teachers about how to support students and achieve successful performance.

As educators conceptualize critical thinking, there are several frameworks that define the various levels of critical thinking and that the developers of *ThinkUp! ELAR* used to align activities and assessment items. In 1956, Benjamin Bloom in his book *Taxonomy of Educational Objectives* proposed a thinking taxonomy that is still used by teachers as an established hierarchy of critical thinking skills. Recognizing the existence of different levels of thinking behaviors important to learning, Benjamin Bloom and his colleagues developed Bloom's Taxonomy, a common structure for categorizing test questions and designing instruction. The taxonomy is divided into six levels, from basic factual recall, or Knowledge, to the highest order, Evaluation, which assesses value or asks the teacher or learner to make judgments among ideas. This framework was revised and clarified (Anderson et al., 2001). The revised taxonomy changed the names of each level to verbs to show that thinking is active and changed the order of the sixth or highest level of thought, making Evaluate the fifth level and Create the sixth level. The six levels of thinking are known as the Cognitive Domain and a second domain was added, termed the Knowledge Domain. Mentoring Minds flip charts identify and define the six levels of thinking and suggests multiple questioning prompts for each of the levels.

Another framework is Norman Webb's Depth of Knowledge (DOK), which was developed in 1997. Norman Webb's Depth of Knowledge framework (2002) was expanded to the content areas and is used to categorize a task or an assessment item according to the complexity of thinking required of students to successfully engage with and complete the task or item. The four levels of DOK require students to interact with content in different and deeper ways as the cognitive demand progresses with each level: Level 1: Recall and Reproduction; Level 2: Skills and Concepts; Level 3: Strategic Thinking/Reasoning; Level 4: Extended Thinking. Webb's DOK levels can be applied across all content areas. This useful tool guides teachers to better design instruction and assessment that increases rigor and develops deeper understanding. Unlike RBT, the verb does not categorize the level of thinking; the key factor is the context in which the verb is used, and the depth of thinking required. Attention seems to increase so much more than in previous years to students' abilities to think critically (Hobgood, Thibault, and Walberg, 2005). Still another framework described is the Cognitive Rigor Matrices (CRMs) devised in 2009 by Karin Hess by combining Revised Bloom's Taxonomy with Webb's DOK. Instructional curricular examples are featured on each matrix. School leaders must be aware that teachers can use these frameworks to guide instructional planning and assessment to ensure that higher-level thinking is incorporated into everyday learning.

In the 1950s, Bloom found that 95% of the test questions developed to assess student learning only required thinking at the lowest level of learning, recall of information. Similar findings indicated an overemphasis on lower-level questions and activities with little emphasis on the development of students' thinking skills (Risner,

Skeel, and Nicholson, 1992). Studies over the last 40 years have confirmed Bloom's Taxonomy of the Cognitive Domain as a framework to establish intellectual and educational outcomes. The conclusions reached by researchers substantiate that students achieve more when they manipulate topics at the higher levels of thinking.

Studies show that the art of asking questions with an emphasis on higher-level thinking can advance student achievement. Marzano, Pickering, and Pollock (2001) reported how teachers can increase their effectiveness in teaching and learning by using research findings on questioning strategies. An important conclusion showed learning to increase in classrooms where teachers asked questions related to essential content rather than questions teachers gleaned would interest students (Alexander, Kulikowich, & Schulze, 1994; Risner, Nicholson, & Webb, 1994). Fillippone (1998) found that teachers ask lower-level questions more times than not. *ThinkUp! ELAR* emphasizes the importance of questioning with the inclusion of activities and assessment items that promote high-level classroom conversations.

Research indicates that thinking skills instruction makes a positive difference in the achievement levels of students. Past studies that reflect achievement over time show that learning gains can be accelerated. In verbal learning, research reports that the depth with which students process information has a definite impact on retention (Craik, 1979; Haller, Child, and Walberg, 1988). These results indicate that the teaching of thinking skills can enhance the academic achievement of participating students (Bass and Perkins, 1984; Freseman, 1990; Matthews, 1989; Nickerson, 1984). In the student editions, the content and activities show an emphasis placed on an expectation of higher order thinking and learning. With the integration of thinking traits, there appears to be

a significant shift towards what Ritchhart (2015) describes as cultures of thinking. Zohar and Dori (2003) found when such a shift was placed on thinking and learning that all students, both high achievers and low achievers made considerable progress in higher order thinking when exposed to processes that were designed to nurture higher order thinking skills. Therefore, the implication was for teachers to nurture thinking among all learners no matter their academic levels. It appears that when higher order skills are used in the application of knowledge then diverse students grasp a better understanding of content. In *ThinkUp! ELAR*, all students are encouraged to participate in thinking at higher levels. The learning experiences are designed to include the diverse levels and abilities of all students.

Observations of *ThinkUp! ELAR* indicate that activities are designed to be cognitively challenging which is as it should be in a thinking environment. According to Tharp et al., 2000, p. 30), cognitively challenging activities should reflect "productive tension" which means they are neither too easy or difficult. Producing correct answers is not always the goal of such challenging activities, but rather the goal is to lead students to consider alternatives as they think, and problem solve. High expectations for learning are intended to be the result of cognitively challenging activities. Therefore, the use of thinking frameworks, as indicative through the coding of assessment items and other activities, provides evidence that higher order thinking is present in the resources, but teachers must successfully facilitate the development of or guide students to those levels. High-order thinking not only appears to improve achievement but can favorably impact development for non-native speakers of English. Therefore, *ThinkUp! ELAR* provides support in setting expectations in teaching critical thinking

and meeting the requirements for incorporating research-based strategies and pedagogically sound principles for teaching and learning. A review of literature does suggest that a focus on higher order thinking can yield positive achievement gains.

Based on each state's accountability plans, all states and schools will have challenging, yet well-defined standards of achievement and accountability plans, requiring all students to reach mastery of the standards for each content area. Frequency Charts are featured in the Teacher Edition to indicate the count of selected-response items within the unit that addresses the specified standard. This tool supports teachers as they are responsible for instruction designed around standards that integrate with the concept/content taught. To achieve mastery, students must think critically. As students engage in deeper thinking, the type of environment of the school and classroom will impact the success levels of students. With skillfully designed teaching tools that offer quick-and-easy access to traits which define thoughtful thinkers as well as access to practical ideas, strategies, and tips, a path is charted to build thinking-centered schools that develop and strengthen thinkers.

Alluded to earlier in this document, the prevailing theme in the *ThinkUp! ELAR* is critical thinking—an essential element for preparing all learners to succeed in school and throughout their lives—integrated within the context of ELAR. Students do not enter school and automatically transform into critical thinkers. A thinking environment must be a shared priority that is created throughout the school to help students learn to think critically. Classroom teachers need resources that offer support in assisting students and parents in embracing critical thinking, developing thinking traits, and purposefully cultivating a thinking

environment. Understanding how to produce thinkers who take learning to a deeper level is a challenge yet essential to the success of students as productive citizens and future leaders. The Product Development Team at Mentoring Minds created *ThinkUp! ELAR* to promote high levels of student and teacher performance.

Student achievement is ultimately determined and limited by the opportunities they have had to learn. "All students must learn to think no matter the subject area. With the passing of Every Student Succeeds Act (ESSA), this federal law requires that academic assessments for "math and reading or language arts be administered annually in grades 3–8 and at least once in grades 9–12…" (Mandlawitz, 2016, p.1). The critical issue of accountability will continue with ESSA, with assessments being used to help improve schools and inform instruction. The law allows the state and local levels the opportunity to create systems for accountability, resources, interventions and teacher evaluation systems. The federal requirements of *Every Student Succeeds Act* mandate that all students participate in the state assessment program. Critical thinking is integrated into assessment items and performance tasks. If we don't explicitly build a thinking environment, how will our students learn to think, much less think at deeper levels?

Thinking skills equip students with the ability to navigate challenging life circumstances, economic changes, and complex political challenges. There

are direct implications for educators in elementary and high schools. As educators design instruction, it is imperative to evaluate and determine if curricula and assessment that emphasize authentic real-world problems, inquiry-based learning, and opportunities for students to apply what they know in meaningful ways are worked into the instructional design (Stobaugh, 2013a; 2013b). This strengthens the need for resources that support the development of critical thinking, resources that support teachers in the creation of thinking ELAR classrooms, and resources for students that develop and practice thinking in the context of ELAR. Thus, the intent of *ThinkUp!* ELAR is to guide educators on this journey.

The need for critical thinking and problem-solving skills in our schools is not denied by educators. Today, where new knowledge is rapidly accelerating, and information is instantly available, it is more important than ever that students know how to think critically and reach reasonable solutions. Students who display critical thinking and problem-solving skills can interpret and evaluate what they read, see, and hear to effectively make the transition to college or to the workforce and face whatever challenges life might bring. The resource *ThinkUp! ELAR* weaves together the nine traits, critical thinking skills, and content-specific concepts—emphasizing that successful instruction in skillful thinking should occur while teaching subject matter rather than in addition to teaching subject matter.

Bibliography for ThinkUp! ELAR

Achieve. (2006). *Closing the expectations gap 2006: An annual 50-state progress report on the alignment of high school policies with the demands of college and work.* Retrieved from www.achieve.org/files/50-state-06-Final.pdf.

Achieve (2015). *Rising to the challenge: Views on high school graduates' preparedness for college and careers.* Retrieved from http://www.achieve.org/rising-challenge-survey-2-powerpoint

Alexander, P., Kulikowich, J., & Schulze, S. (1994). How subject-matter knowledge affects recall and interest. *American Educational Research Journal*, 31(2), 313-337.

Anderson, L., Krathwohl, D., Airasian, P., Crusikshank, K., Mayer, R., Pintrich, P., Raths, J., & Wittrock, M. (2001). *A taxonomy for learning, teaching, and assessing.* New York, NY: Addison Wesley Longman, Inc.

Association of American Colleges and Universities (2013). It takes more than a major: Employer priorities for college learning and student success. Washington, DC: Hart Research Associates. https://209.29.151.145/sites/default/files/files/LEAP/2013_EmployerSurvey.pdf

Bass, G., Jr. & Perkins, H. (1984). Teaching critical thinking skills with CAI. *Electronic Learning* 14, 32, 34, 96.

Beck, I., McKeown, M., & Kucan, L. (2002). *Bringing words to life: Robust vocabulary instruction.* New York: Guilford Press.

Black, P., Harrison, C., Lee, C., Marshall, B., & Wiliam, D. (2003, April). A successful intervention —Why did it work? Paper presented at the annual meeting of the American Educational Research Association, Chicago. Retrieved from https://www.researchgate.net/publication/258423109_A_successful_intervention_why_did_it_work

Bloom, B., Englehart, M., Furst, E., Hill, W., & Krathwohl, D. (1956). *Taxonomy of educational objectives: Handbook I: Cognitive Domain*. New York: McKay.

Carr, P. (2017). Highlights from the Progress in International Reading Literacy Study (PITLS) and ePIRLS: 2016 (PowerPoint presentation). Washington, DC: IES National Center for Education Statistics. Retrieved from https://nces.ed.gov/surveys/pirls/pirls2016/

Costa, A. & Kallick, B. (Eds) (2008). *Learning and Leading with Habits of Mind: 16 Essential Characteristics for Success*. Alexandria, VA: ASCD.

Costa, Arthur & Kallick, Bena, Eds. (2009). *Habits of mind across the curriculum: Practical and creative strategies for teachers.* Alexandria, VA: Association for Curriculum and Development.

Craik, F. (1979). Human memory. *Annual Review of Psychology*, 30, 63-102.

Darling-Hammond, L. (2004). Standards, accountability and school reform. *The Teachers College Record*, 106(6), 1047–1085.

de Bruin, W. B., Parker, A. M., & Fischhoff, B. (2007). Individual differences in adults decision-making competence. *Journal of Personality and Social Psychology, 92*, 938–956.

ELA Product Development Team (2017 January/February). *Online survey of STAAR ToMo Reading and Writing* [Survey]. Tyler, TX: Mentoring Minds.

ELA Product Development Team (2018, September 26). *ELAR Focus Group* [Meeting]. Tyler, TX: Mentoring Minds.

Facione, P. A. (1990a). *Technical report #1: Experimental validity and content validity.* Millbrae: California Academic Press. (ERIC 327 549).

Facione, P. A. (1990b). *Technical report #2: Factors predictive of CT skills*. East Lansing, MI: National Center for Research on Teacher Learning. (ERIC ED 327 550).

Fillippone, M. (1998). *Questioning at the elementary level.* Master's thesis, Kean University. (ERIC Document Reproduction Service No. ED 417 421).

Fisher, D., & Frey, N. (2013). *Better learning through structured teaching: A framework for the gradual release of responsibility* (2nd ed.). Alexandria, VA: ASCD.

Frank, P. (1947). *Einstein: His Life and Times*. New York: Alfred A. Knopf.

Freseman, R. (1990). *Improving higher order thinking of middle school geography students by teaching skills directly*. Fort Lauderdale, FL: Nova University.

Fuhrken, C. (2009). *What every elementary teacher needs to know about reading tests*. Portland, MA: Stenhouse Publishers.

Goleman, D. (1995). *Emotional intelligence: Why it can matter more than IQ.* New York: Bantam Books.

Gunning, T. (2003). *Creating literacy instruction for all children*, Fourth Edition. Boston, MA: Allyn & Bacon/Pearson Education.

Haller, E., Child, D., & Walberg, H. (1988). Can comprehension be taught? A quantitative synthesis of metacognitive studies. *Educational Researcher*, 17, 5-8.

Hattie, J. (2009). *Visible learning: A synthesis of over 800 meta-analyses relating to achievement.* London: Routledge.

Heritage, M. (2007). Formative assessment: What do teachers need to know and do? *Phi Delta Kappan,* 89(2), 140-145.

Hess, K., Carlock, D., Jones, B., & Walkup, J. (2009). What exactly do fewer, clearer, and higher standards" really look like in the classroom? Using cognitive rigor matrix to analyze curriculum, plan lessons, and implement assessments. In Hess' Local Assessment Toolkit: Exploring Cognitive Rigor. Retrieved from http://www.karin-hess.com/#!Fewer-clearer-and-higher-standards/cmbz/91/01F31B21-D92E-4550-AEB6-81AFBE0A20BC

Hobgood, B., Thibault, M., & Walbert, D. (2005). *Kinetic connections: Bloom's taxonomy in action*. University of North Carolina at Chapel Hill: Learn NC.

IES/NCES (National Center for Education Statistics). (2017). Progress in international reading literacy study (PIRLS). Retrieved from https://nces.ed.gov/surveys/pirls/pirls2016/findings.asp

Jerald, Craig D. (2009, September), Defining a 21st century education. Alexandria, Va.: Center for Public Education. http://www.centerforpubliceducation.org/Main-Menu/Policies/21stCentury/Executive-summary-Defining-a-21st-Century-education-.html

Joyce, B. & Showers, B. (2002). Student achievement through professional development. In B. Joyce & B. Showers (Eds.), *Designing Training and Peer Coaching: Our Need for Learning*. Alexandria, VA: ASCD.

Kutner, M., Greenberg, E., Jin, Y., Boyle, B., Hsu, Y., & Dunleavy, E. (2007). *Literacy in everyday life: Results from the 2003 National Assessment of Adult Literacy (NCES 2007–480).* Washington, D.C.: U.S. Department of Education, National Center for Education Statistics.

Mandlawitz, Esq., M.R. (January, 2016). Every student succeeds act: Summary of key provisions. Retrieved from http://www.casecec.org/legislative/Every%20Student%20Succeeds%20Act_CASE%20(2).pdf

Marzano, R. (2003). *What works in schools: Translating research into action*. Alexandria, VA: ASCD.

Marzano, R. (2006). *Classroom assessment and grading that work*. Alexandria, VA: ASCD.

Marzano, R. J. (2009). Setting the record straight on "high yield" strategies. *Phi Delta Kappan, 91*(1), 30–37.

Marzano, R., Pickering, D., & Pollock, J. (2001). *Classroom instruction that works: Research-based strategies for increasing student achievement.* Alexandria, VA: Association for Supervision and Curriculum Development.

Matthews, D. (1989). The effect of a thinking-skills program on the cognitive abilities of middle school students. *Clearing House*,62, 202-204.

Mentoring Minds. (2017 May). 9 traits of critical thinking [Web log message]. Retrieved from http://mentoringminds.com/learn/log/9-traits-of-critical-thinking

MetLife. (2011). The MetLife survey of the American teacher: Preparing students for college and careers. Retrieved from www.metlife.com/about/corporate-profile/citizenship/metlife-foundation/metlife-survey-of-the-american-teacher.html?WT.mc_id=vu1101.

Nagy, W. (2005). Why vocabulary instruction needs to be long-term and comprehensive. In E. Hiebert & M.L. Kamil (Eds.), *Teaching and Learning Vocabulary: Bringing Research to Practice* (27-44). Mahwah, NJ: Eflbaum.

National Center for Education Statistics (2011). The condition of education 2011. Retrieved from http://nces.ed.gov/pubs2011/2011033_4.pdf

National Center for Education Statistics (2012). Highlights from PIRLS 2011. Washington, D.C.: U.S. Department of Education. Retrieved from http://nces.ed.gov/pubs2013/2013010rev.pdf

National Center for Education Statistics. (2013a). NAEP 2012 Trends in academic progress (NCES 2013-456). Washington, D.C.: U.S. Department of Education. Retrieved from http://nces. ed.gov/nationsreportcard/subject/publications/main2012/pdf/2013456.pdf

National Center for Education Statistics. (2013b). The NAEP reading achievement levels by grade. Retrieved from http://nces.ed.gov/nationsreportcard/reading/achieve.asp

National Center for Education Statistics. (2014). A first look: 2013 mathematics and reading National Assessment of Educational Progress at grades 4 and 8. (NCES 2014-451). Washington, D.C.: U.S. Department of Education. Retrieved from http://nces.ed.gov/nationsreportcard/subject/publications/main2013/pdf/2014451.pdf

National Reading Panel (NRP). (2000). *The report of the national reading panel: Teaching children to read*. Washington, D.C: National Institute of Child Health and Human Development Clearinghouse.

Nickerson, R. (1984). *Research on the training of higher cognitive learning and thinking skills*. Final Report # 5560. Cambridge, MA: Bolt, Beranek and Newman, Inc.

Nisbett, R. E. (2016). Tools for smarter thinking. *Educational Leadership, 73*(6), 24-28.

Organization of Economic Co-operation and Development. (2013*).* Time for the U.S. to reskill? What the Survey of Adult Skills says. Retrieved from http://skills.oecd.org/ Survey_of_Adult_Skills_US.pdf

Paul, R. & Elder, L. (2000). *Critical thinking: Tools for taking charge of your learning and your life*. Saddle River, NJ: Prentice-Hall.

Pearson, P. D., & Gallagher, M. (1983). The instruction of reading comprehension. *Contemporary Educational Psychology*, 8(3), 317–344.

Perkins, D. (1991). What creative thinking is. In A. Costa (Ed.), *Developing minds: A resource book for teaching thinking* (Rev. ed., Vol. 1, pp. 85–88). Alexandria, VA: ASCD.

Project Tomorrow (2014). The new digital learning playbook: Advancing college and career ready skill development in K-12 schools. Irvine, CA: Project Tomorrow. Retrieved from: http://www.tomorrow.org/speakup/pdfs/SU13Educatorreport_WEB.pdf

Rice, J. (2003). *Teacher quality: Understanding the effectiveness of teacher attributes*. Washington, DC: Economic Policy Institute.

Ripley, A. (2013). *The smartest kids in the world*. New York, NY: Simon & Schuster.

Risner, G., Nicholson, J., & Webb, B. (1994). *Levels of comprehension promoted by the Cooperative Integrated Reading and Composition* (CIRC) Program. Florence: University of North Alabama. (ERIC Document Reproduction Service No. ED 381 751).

Risner, G., Skeel, D., & Nicholson, J. (1992). A closer look at textbooks: what research says. *Science and Children*, 30, 42-45, 73.

Ritchhart, R. (2002). *Intellectual character: What it is, why it matters, and how to get it.* San Francisco, CA: Jossey-Bass.

Ritchhart, R. (2015). *Creating cultures of thinking: The 8 forces we must master to truly transform our schools*. San Francisco, CA: Jossey-Bass.

Shepard, L. (2000). The role of assessment in a learning culture. *Educational Researcher*, 29(7), 4-14.

Stahl, S. & Fairbanks, M. (1986). The effects of vocabulary instruction: A model-based meta-analysis. *Review of Educational Research*, 56, 72-110.

Sternberg, R. J. (2008). *Cognitive psychology* (5th ed.). Belmont, CA: Thomson-Wadsworth

Stobaugh, R. (2013a). *Assessing critical thinking in elementary schools: Meeting the Common Core*. Larchmont, NY: Eye on Education.

Stobaugh, R. (2013b). *Assessing critical thinking in middle and high schools: Meeting the Common Core*. Larchmont, NY: Eye on Education.

Texas Education Agency (TEA). (2017). 19 TAC Chapter 110. Texas Essential Knowledge and Skills for English Language Arts and Reading. Austin: Texas Education Agency. Retrieved from http://ritter.tea.state.tx.us/rules/tac/chapter110/index.html

Tharp, R. G., Estrada, P., Dalton, S.S. & Yamauchi, L.A. (2000). *Teaching transformed. Achieving excellence, fairness, inclusion, and harmony*. Boulder, Colorado: Westview Press, 30-31.

U.S. Department of Education. (1990–2007). National assessment of educational progress. National Center for Educational Statistics. Retrieved September 1, 2007 from http://nces.ed.gov/nationsreportcard/

Vacca, J., Vacca, R., Cove, M., Burkey, L., Lenhart, L., & McKeon, C. (2003). *Reading and learning to read*, Fifth Edition. New York, NY: Longman.

Walsh, J. A., & Sattes, B. D. (2011). *Thinking through quality questioning: Deepening student engagement.* Thousand Oaks, CA: Corwin.

Webb, N. (March 28, 2002) "Depth-of-Knowledge levels for four content areas," unpublished paper. Retrieved from http://facstaff.wcer.wisc.edu/normw/All%20content%20areas%20%20DOK%20levels%2032802.pdf

Wenglinsky, H. (2000). *How teaching matters: Bringing the classroom back into discussions of teacher quality.* Princeton, NJ: Milken Family Foundation and Educational Testing Service.

Young, V. (2017, May). *The revision of the Texas Essential Knowledge and Skills for English Language Arts/ Reading* [Presentation]. Tyler, TX: Mentoring Minds.

Young, V. (2018*). The 2017 English Language Arts and Reading TEKS A new approach to literacy development* [Article]. Tyler, TX: Mentoring Minds.

Zohar, A., & Dori, Y. J. (2003). Higher order thinking skills and low achieving students: Are they mutually exclusive? *Journal of the Learning Sciences,* 12, 145-181.