Using Brain-based Learning to Help Struggling Online High School English Students

Dr. Rebecca Stephens

Daniel J. Dondlinger

December 2018

A thesis submitted in partial fulfillment of the requirements

For the degree of Master of Science in Teaching—English

Department of English

University of Wisconsin—Stevens Point

Stevens Point, Wisconsin

Using Brain-based Learning to Help Struggling Online High School English Students

A trend in Kindergarten to 12th grade education is the emergence of online or virtual schools. The increasing popularity of these charter schools is seen in the infographic provided by Connections Academy. 1.5 million students were "taking part in online/ blended learning" during the 2009-2010 school year; after four years, there were 2.7 million students schooling online in some capacity (Connections Academy). Nationally, this 1.2 million student growth indicates families finding online schooling as an increasingly viable option. The Wisconsin Department of Instruction shows a similar trend, on a smaller scale. According to the Department of Instruction's spreadsheet, "Virtual Charter School Enrollment 2002-03 to 2017-18," Wisconsin saw an increase in both the number of virtual charter schools and the number of students attending those charter schools. In the school years between 2002-03 and 2017-18, the number of Wisconsin virtual charter schools grew from four to 39 and the number of students enrolled grew from 265 to 6905" (Mittnacht). Wisconsin is seeing significant growth. The author teaches English in one of Wisconsin's virtual schools. March, Carr-Chellman, and Stockman (2009) indicate that enrollment in online education is "increasing 20% annually" (qtd. in Kim, et al. 522). Both nationally and locally, it appears online charter schools are a growing trend. With a growing number of families choosing this education venue, online education demands more attention from educators.

Parents are choosing online charter schools for a variety of reasons. Some students do not thrive or perceive that they do not thrive in the traditional brick and mortar setting. Kim, et al. state,

> As 24% of parents in the United States move based on their school choice (Greene et al., 2010) and while virtual schooling is poised for explosive growth, an online charter school

> option will increasingly become an important new specie in the education ecosystem for at least two reasons: It may serve the student who could not or would not enroll in other options (e.g., personal or school quality reasons) [sic] and it may cause mediocre or bad schools to improve their education service quality in order to stay competitive in the ecosystem (540).

Aside from confirming the growth of online education, Kim, et al. demonstrate one of the main reasons which the author has experienced from talking with his students and families: their previous school was not working for them. Undoubtedly, this opinion could be more the parent or student's perception rather than fact in many cases; however, it is a basis for making the choice to school online. A second reason families choose online school is "[t]eens can make up missed credits" (Littlefield). While this may be a main motivating factor, there are a few reasons why a student could be credit deficient. Disengagement with the traditional classroom would be a reason already raised with Kim, et al. Another reason is increased skill deficiencies as reflected on standardized tests such as the SAT and ACT. In Wisconsin, online charters are given to those schools that serve children at risk ("Information for Authorizers"). The Department of Instruction defines At-Risk Students as those who meet two or more of the following criteria:

- One or more years behind their age group in the number of high school credits attained.
- Two or more years behind their age group in basic skill levels.
- Habitual truants, as defined in s. 118.861(1)(a).
- Parents.
- Adjudicated delinquents.
- Eighth grade students whose scores in each subject area on [state-statue-required examinations] was below basic level, 8th grade pupils who failed [state-statue-required

> examinations], and 8th grade pupils who failed to be promoted to the 9th grade ("Information for Authorizers").

This fact of charter preference increases the likelihood that students will enter an online charter school credit deficient, and possibly, skill deficient. As families look for educational options, the online environment will continue to attract students who are looking for alternatives to the traditional classroom.

With more students entering the online environment, undoubtedly teacher preparation programs will develop to supply highly trained individuals to meet that need. Quevillon states, "Yet for online teaching, class is completely different." Online teaching presents a number of obvious challenges. Murphy, et al. interviewed 42 Canadian high school distance education teachers; regarding challenges of online teaching, they noted that instruction tended to be lecture-based, instructor oriented (585). As a former instructional coach for K12, Inc., the author has had opportunity to observe over 40 online teachers. Those observations would collaborate Murphy, et al.'s findings: synchronous class sessions tend to be lecture-based. One teacher in Murphy, et al.'s study says " . . . the kids prefer to chat and not talk on Skype" (588). This is the author's experience in the classroom as well. Students are reluctant to use the microphone to speak to the rest of the class, but they will chat readily. Another challenge of the online environment is the separation of teacher and students. Murphy, et al. states:

> Unlike with AOT [asynchronous online teaching], teachers and students are temporally dependent, which means that they must schedule their presence to coincide. However, as with AOT, the teacher and students can be geographically diverse and independent (584).

These two aspects of the synchronous instructional landscape, time and geography, can pose great challenge. As mentioned above, students come to online schooling for many reasons. Some of those reasons include credit deficiency and truancy. The teacher may find it a challenge to get the student into the online classroom. Quevillon notes in her blog, ". . . students have to be active participants in the quality, breadth and depth of their learning, and this is no more obvious than in online coursework. Students will get out what they put in it." To synthesize these ideas, combining Quevillon's observation with Murphy, et al.'s high school distance education teachers who indicated their instruction tended to be lecture-based, instructor oriented (585), we see a potential for student disengagement, turning students into passive rather than active learners. To build on this thought, multiple distractions are pulling at a student's attention. Gazzaley and Rosen indicated "[d]istraction occurs . . . when we are pursuing a goal that really matters and something blocks our efforts to achieve it" (qtd. in Lang). Now imagine being an early high school student, age 14, potentially schooling without a learning coach or parent present, given the choice of listening to a lecture online on a topic of low interest or visiting websites with higher interest. The student simply has to minimize the lecture window and open another to travel to his or her favorite website. The student has to make this choice every time he or she sits down to school. Imagine if this distraction was of greater importance, like a job to contribute the family income, relationship problems with family, friends or significant others, or some other major issue that teens face daily. Engaged attendance can be a serious issue.

These three idea strands: emerging online school options, struggling and At-Risk students choosing online schooling, and teaching challenges presented by the online environment, are related and, when combined, demonstrate an area of education that needs immediate attention. The pieces of the puzzle, students who struggle with school or are skill/

credit deficient and school environments that can be challenging both for the student and teacher, are being placed concurrently. This does not mean that all students in online environments are struggling somehow; that is not true. This situation suggests we, as teachers, discover ways that these struggling, At-Risk students can find success in the online environment. Faced with this exact situation, the author found himself with a homogenously-grouped, online class of struggling, standard-test-deficient-scoring, school-skill-and-credit-lacking, high school students. The author struggled to try to meet the needs of this diverse group which only held lack of academic success in common. After taking a course in Brain-Based Learning, a course in high school literacy, as well as courses in writing and literature teaching methods, he realized that, while the labels were different, common pedagogy and philosophy existed. The challenge, as always, is translating these ideas to the online environment and, specifically, to a high school English course intentionally populated with academically struggling 10^{th}, 11^{th}, and 12^{th} graders. The addition of Brain-Based Learning strategies would help those struggling students who are brave enough to try them. While solid English Language Arts pedagogy will be able to transfer from the traditional to online environment, online English Language Arts teachers should add techniques and strategies suggested by brain-based research to fully support struggling English Language Arts students in the online environment.

Many articles and books are available discussing brain-based learning and brain-based strategies. To provide some framework, much of our discussion launches from selected strategies presented by Jensen and Snider in *Turnaround Tools for the Teenage Brain*, a resource with the purpose of helping underperforming teenagers find academic success. With the volume of information available, let us start with a definition. Brain-based education is “more aligned with how the brain naturally learns best . . . Based on research from the disciplines of neuroscience,

biology, and psychology, our understanding of the relationship between learning, and the brain" (Jensen, *Brain-Based Learning* xii). In essence, brain-based learning takes the bioscience research about the brain and discusses how the brain learns. Jensen boils down brain-based teaching to "E.S.P. E-the active ENGAGEMENT S-of purposeful STRATEGIES P—based on PRINCIPLES derived from neuroscience" (*Brain-Based Learning* 4). Looking at these pieces together, engagement, strategies, and principles, we can start to see the emergence of how online teachers can adapt brain-based teaching and learning to our online environment. As teachers, we should be interested in how our students learn best.

The first fact that must be established is that our students' brains are developing and changing. Of course, our students' brains do not all change and develop at the same time or at the same rate. "Healthy normally functioning children at the same age could have 50% differences in brain volume" (Lenroot and Giedd 722). Keep in mind that adolescents have some consistent patterns as their brains are developing. Over the next paragraphs, we will discuss the biological activity of brains cells and learning.

To begin, we should review the basic biology of how the brain works and learns. First, the brain has two types of cells: neurons and glial cells. The operation of the neuron is as follows:

> A neuron has three basic parts: the *cell body*, the *dendrites*, and the *axon* . . . Information enters the cell body through appendages called *dendrites* . . . dendrites are constantly moving as they seek information. If the neuron needs to send a message to another neuron, the message is sent out through the axon. When a neuron sends information down its axon to communicate with another neuron, it never actually touches the other neuron. The message has to go from the axon of the sending neuron to the dendrite of the

> receiving neuron by "swimming" through a space called *synapse*. As the neurons make connections, the brain is growing dendrites and strengthening the synapses (Sprenger).

This fascinating process of communication is crucial to understanding how help students. Our students' brains must be encouraged to continue to make connections, the process for doing this will be discussed later.

One other component of neurons is the myelin that surrounds the axon. "Myelin, a fatty lipid substance that forms around well-used axons, is present around all axons to some degree. Myelination seems to not only speed the electrical transmission (up to twelvefold) but also reduce interference from other nearby reactions" (Jensen, *Brain-Based Learning* 13). This is significant substance helps our neurons communicate with each other. Probably most notable, white matter is "nerve tissue of the spinal cord, surrounding gray matter and made up mostly myelinated and unmyelinated nerve fibers" (White Matter). Why is white matter important? Because of these myelin sheaths, transitions are fast, connecting the grey matter regions (Balm). This white matter is the reason the brain works as it does. Balm cites an article from *Molecular Autism* that "identified white matter abnormalities in autism." White matter is important because it transports messages from one neuron to another across the brain. How does this relate to struggling high school students? "[T]he amount of white matter in the brain generally increases throughout childhood and adolescence" (Lenroot and Giedd 723). It is important to recognize this is the time when our students are developing the physical structures that allow the pathways of learning to occur. Giedd et al., 1999 reinforces this idea, "A second change, in so-called white matter, is enhanced myelination, that is increased insulation of established neuronal connections, improving their efficiency" (qutd. in Kuhn 59). Kuhn goes on to state, "By middle to late adolescence, then, the evidence suggests, teens have fewer, more selective, but stronger, more

effective neuronal connections than they did as children" (59). Her words, "fewer, more selective," refers to the process of neural pruning, which is a reduction of unused neuronal connections (Kuhn 59). Although we are not specifically dealing with neural pruning at this time, the importance of unused neural pathways being "pruned" should be acknowledged. To return to our struggling English Language Arts students, we must realize that major changes are happening in their brains from development of more myelin to more brain mass to pruning of unused pathways. As we teach, we must use methods that take advantage of this time of white matter development in order for students to make more and stronger neural connections during learning.

One other detail regarding the synapses is the chemical transition, or what Sprenger referred to as "swimming" across the synapse. First, the synaptic transition can be either electrical or chemical, sometimes both within the same cell ("The synapse."). This fact of chemical transition is important to us as we work with students. This chemical transition is accomplished by neurotransmitters. Many different neurotransmitters exist in the human brain. Jensen tells us, "Neurotransmitters influence the synaptic reactions and result in learning impairment, enhancement, or no effect" (*Brain-Based Learning* 14). Our students' brains are influenced by the neurotransmitters constantly. Jensen gives further illustration with a number of examples:

> For example, a low level off the stress hormone *cortisol* during a learning has no know effect. Moderate levels, however, enhance synaptic efficiency, and high levels impair learning . . . A teacher can influence some neurotransmitters (e.g., adrenaline is increased by the type of risk, urgency, and excitement that can happen in a classroom competition),

> but others are not easily modified (e.g., glutamate seems impervious to our behaviors) (*Brain-Based Learning* 14).

Jensen's example of cortisol demonstrates the role that neurotransmitters can play in our student's learning. Additionally, the teacher needs to be careful not to create or allow a situation that triggers adrenaline, which, in turn, can stimulate a flight or fight response as discussed below when describing the thalamus. Neurotransmitters appear to make the teacher's job easier or more difficult, contingent on which neurotransmitters are "swimming" in his or her students' synapses.

While the neuron is the thinking cell of the brain, it does not do its work well without the support of the glial cells. Sprenger describes their function as this: "The glial cells feed and do the housekeeping for the neurons, almost attaching themselves to the neurons to keep them nourished" (Sprenger). These cells are very important to good neuron function; therefore, they are important to learning. Neurons function better because of the glial cells. "Communication remains fast and easy because these glial cells work and nurture the neurons" (Sprenger). Jensen reinforces this idea, "we know that they [glial cells] are equal to neurons in their capacity, function, and importance. Amazingly, neurons grown with glial cells in a lab culture are not just slightly, but a whopping 10 times more active than neurons grown alone" (Allen & Barnes qutd. in *Brain-Based Learning* 12). For an educator to encourage students with brain-based learning, that educator must not only know how brain cells work, but also how learning occurs.

Currently, a seven-step process describes how the brain learns. This process happens very quickly. Jensen outlines the following seven-step process explaining how the brain learns new content:

1. Input comes from our senses or is activated by thinking or memory
2. Information is routed to the thalamus for initial processing
3. Simultaneously, the information is routed to the appropriate cortical structures for further processing (occipital, temporal lobes, etc.)
4. It is also immediately routed to subcortical areas (i.e. the amygdala)
5. If it is an emergency stimulus, the amygdala will respond ASAP and recruit other brain areas.
6. Later, information is sent to the hippocampus for more subtle evaluation and is held over time.
7. Over time the hippocampus will organize, distribute, and connect the memories with other appropriate areas of the cortex for long-term storage (Jensen "Chapter 1: Meet Your Amazing Brain").

While this seems like a straight-forward, seven step process, many different individual processes are occurring. While the initial step is self-explanatory, a number of the other steps require some explanation. The thalamus is "one or two large, oval masses of gray matter deep in the cerebral hemispheres concerned with relaying sensory impulses to the cerebral cortex; the thalamus is also the site where crude sensations of pain, pressure, and temperature originate" ("Thalamus."). This definition tells us a number of important things. First, it reinforces the role the thalamus plays in transferring sensory input to the rest of the brain. The thalamus takes that sensory input and sends it to the next part of the brain for further processing. It is important to note the thalamus is not part of the cortex. Once the thalamus receives the sensory input it sends it to two places: the cortex, directing it to the specific lobe, like visual stimuli to the occipital lobe (Jensen, *Brain-Based Learning* 9), and to the amygdala. Interestingly, the frontal lobe holds

much of the new data, only about 7 items, between 15 and 30 seconds (McLeod). More interestingly, the information is also routed to the amygdala. According to Jensen, "If there is any threatening or suspicious data, the amygdala . . . is activated. It will jump-start the rest of the sympathetic nervous system for a quick response" (*Brain-Based Learning* 9). The sympathetic nervous system is "best known for its stimulation of the body's fight-ot-flight response" (Editors at Biology Dictionary). While it would seem that, as teachers, we would be more concerned with the sensory input in the cortex, we cannot ignore the amygdala. The amygdala is associated with emotions and is believed to be responsible for connecting emotion and memory (Jensen, *Brain-Based Learning* 86). Assuming that sensory input is of equal value coming into the thalamus, if an urgent sensory input comes to the amygdala, there will be an activation of the sympathetic nervous system, regardless if the student is in a classroom or not. Assuming that an urgent message is not sent by the amygdala, then the cortex forwards the input it has in short term memory, providing the information is not lost "with distraction or passage of time" (McLeod). Let us pause a moment and consider that sentence for a moment. If a student in class with us experiences a perceived threat, the sensory input from class is potentially gone. If that student experiences a distraction, the sensory input from class is potentially gone. If that student does not do anything with the information in a short period of time, the sensory input from class is potentially gone. The repetition leads us, as teachers, to question our methods, as the student seems to have a better chance of forgetting than remembering. The desire is steps six and seven; the sensory input comes to the hippocampus where "it is organized and indexed . . . and later stored in the cortex" (Jensen, *Brain-Based Learning* 10). Of course, that is the goal of teaching—storage of class information stored in the cortex. Important to realize is "[t]he original processing takes place at lightning speeds, but the subsequent stages and storage process can take hours,

days, and even weeks" (Jensen, *Brain-Based Learning* 10). Teachers need to use strategies that promote long-term storage in the cortex rather than sorted out by the short-term memory. With this brief biological brain-function overview, let us look at how to use this brain biology knowledge to benefit our struggling English Language Arts students.

A myriad of places exist in brain-based learning that could be considered a starting point for this discussion. Our starting point here is change. A number of changes in thinking need to happen. Understand the brain changes constantly. A study reported in *Science* related that after six months of reading instruction, illiterate adults has increased functional plasticity in the subcortical computation centers of the visual system (Yeagle). Of course, our discussion will not center on adult learners, but this example demonstrates that even adult brains, characteristically not known for plasticity, can change. How much more change could occur in our students with developing brains? We must seek to lead our students to intentionally change their brains. Nowhere is that change more necessary than in the online environment, where students must demonstrate a greater amount of self-discipline and organization. Kim, et al. reinforce this idea, stating,

> . . . students (or parents) who consider online education do not necessarily understand that what be actually required in online learning . . . many students learn about online learning after signing up and going through the actual program. In addition, students who are starting in an online program often discover that online learning in fact requires much more active participation and a much higher level of self-regulation along with support often from family or significant others (Kim et al. 522).

The author has nothing but agreement to this statement based on his experiences. Previously noted, the Wisconsin Department of Instruction has an established priority for awarding charters

to those online schools that serve At-Risk students; also, the students defined as At-Risk had some characteristics like high school credit deficiency and basic skill level deficiency ("Information for Authorizers") which would tend to make students with these characteristics unlikely to be more active and self-regulated in regard to skills needed for independent schooling. This probability, of course, does not apply to every At-Risk student; however, it is likely that some, if not all, of these students could benefit from instruction in how to learn, how to school, and how to organize. While these concepts may not be English Language Arts specific, for these struggling students to be able to see success in the online English Language Arts classroom, these skills must be incorporated into solid, establish English Language Arts pedagogy.

What causes the brain to change? First, we must understand that both positive and negative change is possible. At the moment, we will discuss positive change. Jensen and Snider give five characteristics of experiences that drive positive change in our students' brains: persistent, contrasting, meaningful, positive, and consistent (17). We see here a grid to view our classroom activities. A teacher can view his or her lesson plans with a critical eye to note if planned classroom experiences meet some or all of the characteristics described. Second, we must realize that "[t]eens are in a developmental fog and often make decisions even a nine-year-old would call stupid" (Jensen and Snider 21). As humorous as this statement may be, most teachers have experienced this "developmental fog" in our students. This development fog accounts for some of these behaviors like risky behavior, not anticipating consequences for their actions, stewing emotionally, engaging in a crowd morality, self-regulating difficulties, and abusing drugs (Jensen and Snider 22). A teacher may look at that list and say what can I do about

those concerns? It is a valid question. Fortunately, Jensen and Snide provide a list what they call "nudges" to allow teachers to understand how to help teens:

- Relationships
- Attention and buy-in
- Mastery and autonomy
- Brain health
- Coherence and sense making
- Mistakes and error correction
- Challenge
- Time on task (23)

At this time, we will not define these for two reasons. Frist, not all of these ideas will translate well to the online environment. Second, later we will discuss specific strategies and will define these items there. Jensen and Snider have one more poignant thought as we move into brain-based learning strategies, "Brains rarely change through random life events" (23). This is an important point in understanding brain-based learning. We need to be intentional about what and how we teach.

Brain-based learning gives strategies for the educator to help students build the needed skills. Jensen and Snider assert their "Big Four Factors" of brain-based learning: attitude, cognitive capacity, effort, and focused strategy (Jensen and Snider, 3-4). Each of these ideas plays a role in developing the whole person to become a lifetime learner—a person who has the skills to learn in any situation at any age. Caine and Caine write, "Brain-based teaching must fully incorporate stress management, nutrition, exercise, drug education, and other facets of

health into the learning process (66). This approach is definitely wider than grammar, vocabulary, literature, and writing. Admittedly, many items identified by both pairs of authors, Jensen and Snider as well as Caine and Caine, are not easily accomplished or unlikely to be accomplished in the online environment. We need to focus on the pieces we can influence for the greatest effect.

Attitude is part of the human existence. *The Random House College Dictionary* defines attitude as the "manner, disposition, feeling, position, etc. toward a person or thing" (Stein 87). This definition leads us to the point to be made: student attitude toward school matters. Candeias, et al. conclude, ". . . we must keep in mind that for the large majority of pupils success in school depends on their attitudes, the support they perceive (from family, school, community), their motivation to study and keep going, even then they find barriers or difficulties (8). Essentially, what a student thinks about school, their abilities, and learning in general will impact their schooling. To illustrate the negative, Candeias, et al., stated this a bit earlier, "Academic failure determines pupils' attitudes about themselves and their competence, developing the feeling of being less competent than other participants and also more negative expectancies toward future projects and relationships with others (7). Not surprisingly, when students have negative experiences in school, those experiences color their view of future learning experiences. Synthesize this knowledge of attitude-driven experiences with the targeted At-Risk population, and we see a potential for problems. Jensen and Snider phrase it this way, "Academics can be tough, but nurturing a negative attitude toward school will only lead to complications (5). Complications are an understatement! The author's experience has shown that in extreme cases, negative attitudes toward school has resulted in students not even starting an online course. Fortunately, hope exists; "[a]ttitude is one of the most important choices the student will make.

This is the key—attitude is a choice. The real power lies within a student, not outside (Jensen and Snider 6). If attitude is a choice, it is not fixed. Rodgers & Gilmour, 2011 tell us that attitudes "can and do change with learning and experience" (qutd. in Jensen and Snider 6). With this knowledge we can move forward helping our students develop an attitude that will help them in school—and in life.

The English Language Arts teacher must approach his or her students with the mindset that the students can change their attitudes about schooling in general and English specifically. Jensen and Snider identify the "Winner's Mind-set" which comprises these three attitudes: learned optimism, a growth mind-set, and personal accountability (41). Jensen and Snider claim these three attitudes can turn into lifelong learners. They sound good, but what are they and how does a teacher develop them?

First, learned optimism is a self-describing term. Optimism is "a disposition or tendency to look on the more favorable side of happenings or possibilities" (Stein 933), so learned optimism is the idea that optimism, or this favorable view of events and situations, can be learned. An online psychology glossary gives a more formal definition:

> Learned optimism . . . is a mental and emotional state that can be trained and cultivated. As part of the perspective of positive psychology learning optimism can be accomplished by consciously challenging any negative self talk [sic]. This is done by recognizing the negative self-talk that we all engage in sometimes such as "I'm not good looking enough" . . . Once these negative thoughts are recognized it is necessary to substitute positive and optimistic self-talk, such as "I am strong and healthy" ("Learned Optimism").

This formal definition is most helpful. Aside from the repeated thought that optimism can be learned, this definition gives us a clue how to cultivate it our students by using positive self-talk. Martin Seligman's work pioneered the idea of Learned Optimism, which he related to failure in the workplace and school. He stated in his book *Learned Optimism,*

> The traditional view of achievement . . . needs overhauling. Our workplaces and our schools operate on the conventional assumption that success results from a combination of talent and desire. When failure occurs, it is because either talent or desire is missing. But failure also can occur when talent and desire are present in abundance but optimism is missing (Seligman 13).

His contention is that optimism is a third factor in success aside of talent and desire. While this sounds good, is it actually true? Does optimism play a significant role in success? Hoy, et al. conducted a study to prove or disprove Seligman's argument that optimism is a third factor in high achievers. Hoy, et al. reports, "The results of our structural model support Seligman's argument that optimism is a strong force for achievement" (440). Learned optimism is a valuable tool for the English Language Arts teacher. The next step is implementing Learned Optimism.

A number of strategies exist to help students change their brains to develop learned optimism. One place to start is with ourselves. We must be optimistic about our students and our ability to teach them. Academic optimism [a subset of learned optimism identified by Hoy et al.] . . . views teachers as capable, students as willing, parents as supportive, and the task as achievable (Hoy, et al., 440). We, as teachers, must exhibit an optimistic mindset. We must celebrate achievements, especially academic ones as Hoy, et al. instructs school principals directly (440). While the study does focus on principals to celebrate, we should more so in our classrooms, especially in light of the fact we have these students every day. Jensen and Snider

give four strategies: teach reframing skills, teach redirecting skills, teach skills of wearing another person's hat, and model and teach optimism (43). Jensen and Snider's last strategy overlaps the strategy presented by Hoy, et al. We cannot discount our influence as a model of optimism. As English Language Arts teachers, we already deal with perspective and point of view, for instance, the English Language Arts Common Core State Standard in Reading: Informational Texts grades 9-10.5 reads, "Determine an author's point of view or purpose in a text and analyze how an author uses rhetoric to advance that point of view or purpose" ("English Language Arts Standards"). Using the principles of point of view, an English Language Arts teacher can help teach learned optimism. Jensen and Snider present a useful strategy for reframing. First, teach a formula: I + R =C, where I stand for incident—what has happened, R stands for our reaction to this incident, and C stands for the consequences that result from our reaction. The main idea is students will realize, eventually, that they cannot control most events but they can control their reactions and influence the consequences. From this point, the positive self-talk mentioned earlier can be used (Jensen and Snider 42). This is not single event but an ongoing process with repeated modeling and guidance, students can learn optimism.

The second component attitude in Jensen and Snider's "winner's mindset" is a growth mindset (45). It matters how an individual views ability. Dweck identifies the difference in view points on intelligence, personality, creativity as either a fixed mindset or a growth mindset (*Mindset: the New Psychology of Success* 6). Those with a fixed mindset view basic qualities as finite: a person only has so much intelligence, creativity, and so forth; while, the alternative view is these basic qualities of a person can be cultivated through effort, education, and help (Dweck, *Mindset: the New Psychology of Success* 6-7). This concept of growth mindset allows students to believe they can learn and improve skills and abilities, even those that prove extremely difficult

for them. We need to remember, as brain-based learning has pointed out, "we can change our brains, and our brains change every day (Jensen and Snider 45). If you recall the seven-step process for learning, the brain has to change to learn. Armed with this truth, we as English Language Arts teachers must insert the concept of growth mindset into our daily routine. Dweck ponders this idea in her article, "Growth":

> The focus on growth leads us to ask: How can we understand motivation for growth and then use that knowledge to motivate all children to learn? It also leads us to ask questions about how educators should evaluate and reward their students' academic work; about how we know when growth has taken place; and about how we can create a culture of growth (and not simply of grade getting) in every classroom and school (Dweck "Growth").

Speaking from experience, the author has at times seen students not grow at all and earn good grades while watching a student demonstrate much growth but have little impact on scores. Keep in mind that in most schools the grading scale sets the lowest percentage to pass a course at 60% ("How is Grade Point Average Calculated?"), so a student may show a 40- or 50-point improvement and only to see a minimal or negligible letter grade movement. While grades are necessary yet in our system, we must promote the attitude of the growth mindset.

English Language Arts teachers need to promote the growth mindset. The author has an online classroom dedicated to struggling 10th graders (and 11th and 12th graders). Among the commonly heard student comments are "I never was good at writing" and "I never was good at reading." All teachers have encountered students espousing a fixed mindset, assuming that their experience of the past needs to be their experience in the present and future. One idea that Dweck has promoted is the "Power of Yet" (Dweck "The Power of Believing"). Similar to the

self-talk referred to in Learned Optimism, the Power of Yet holds that a person cannot do something "yet." For instance, if a student does not punctuate a sentence correctly, the teacher can respond, "You can't do it yet, but you will." This type of response and the thinking behind it promotes the growth mindset. Dweck further comments:

> Just the words "yet" or "not yet," we're finding, give kids greater confidence, give them a path into the future that creates greater persistence. And we can actually change students' mindsets. In one study, we taught them that every time they push out of their comfort zone to learn something new and difficult, the neurons in their brain can form new, stronger connections, and over time, they can get smarter (Dweck, "The Power of Believing").

As referenced earlier, the brain can and does change. By encouraging new learning through the growth mindset, students learn. Jensen and Snider reinforce this point as they also encourage teaching kids about how the brain works (48). This approach makes sense in that students really do not have any idea how their brain works or how learning occurs. Another strategy presented by Jensen and Snider is "to give students specific feedback and praise them for effort rather than only the final product" (48). As English Language Arts teachers, we should be teaching the writing process. Zemelman and Daniels reinforce the idea of delaying grading until later in the writing process. They state,

> Formative evaluation can help students perceive characteristics of their writing, so they can improve as they revise their work. Grades, on the other hand, tend to put an end to further effort on a given piece. In school, grades mark the end of a piece of work. Once a grade is given, any further revision seems like punishment or, at best, an effort to make up lost ground. Grades may be necessary, but we don't need to put them on *everything*,

> and we can certainly hold them off until the last rounds of revising and proofreading a piece are finished (Zemelman and Daniels 223).

As we encourage students to work their writing through the writing process, we should be giving feedback, not grades to encourage the attitude of a growth mindset.

The final attitude of the "Winner's Mindset" is personal accountability. Jensen and Snider define personal responsibility as "a sense of responsibility that a student feels good about and even embraces personally" (49). Frankly, that definition is not very much help. While numerous articles and blogs exist on the importance of students' personal accountability, there appears to be a general lack of studies on the subject. Jensen and Snider quote no outside sources until they begin to discuss accountability relationships, an idea which is important as well. Despite the lack of references, most teachers would agree with Jensen and Snider that "the process of choosing to claim responsibility for the actions you take is powerful because it reminds you of the effects you have on the world and your ability to make choices" (50). Other professional educators agree with Jensen and Snider. Riley-Ordu and Ordu state, "Students must be taught to be responsible and take ownership for their education," relating that the students are part of a seven levels of student success, beginning with the state and ending with the student (Riley-Ordu and Ordu). Student accountability is integral to student success. Gerstein makes some interesting points, connecting the growth mindset with personal accountability. She includes as part of the fixed mindset attitudes like

- Mediocre is often good enough for me as long as I get the work done.
- I expect my teachers to give me full credit for completion and submission of my work. Quality is not a variable.
- It is okay to just do "enough work to minimally fulfill the requirements.

- Good grades are what really matter to me. I am not really interested in receiving qualitative feedback (Gerstein).

When considering these examples, the author recalls instances when his students have made similar comments, though politer, that carry the same intent. While these may be related closer to the growth mindset discussion, they remind us of the need for student personal responsibility. Fixed mindsets can potentially lead students away from personal responsibility, especially if they view learning capability as fixed because if they feel they are at their maximum limit for intelligence or talent or creativity, no more can be expected of them.

Many opinions are present for developing the attitude of personal responsibility in students. Jensen and Snider list four strategies which can be boiled down to two. First, help students note the choices they make and their control over those choices. Jensen and Snider suggest role modeling and Socratic questioning, among other methods to help students look at their choices (50). Second, accept not excuses but exercise patience as the student learn responsibility (50). These two general strategies make sense. High school students' brains are still developing. Research tells us that our brains do not reach full maturity until the mid-20s (Johnson, et al.). Their undeveloped frontal lobes put them put at risk for reckless behaviors, necessitating intentional practice in assessing and managing risk as well as having trouble anticipating consequences of their behavior (Jensen and Snider 21). Due to these research findings, exercises in reviewing choices while holding to high standards will help students develop those neural pathways. Gerstein created a series of questions she entitled "Growth Mindset: Personal Accountability & Reflection." These are the questions she asks students to reflect upon:

- Did I work as hard as I could have?

- Did I set and maintain high standards for myself?
- Did I spend enough time to do quality work?
- Did I regulate my procrastination, distractions, and temptations in order to complete my work?
- Did I make good use of available resources?
- Did I ask questions if I needed help?
- Did I review and re-review my work for possible errors?
- Did I consider best practices for similar work?
- Is my work something for which I am proud—that I would proudly show to a large, global audience? (Gerstein)

Looking at this list, we may need to revise the language for struggling English Language Arts students, but the key ideas are there: am I taking responsibility for my learning and my work? Combined with Jensen and Snider's principles, these questions, all or in part, would help students reflect and develop their attitude of person responsibility.

Before moving to the second of Jensen and Snider's Big Four Factors of brain-based learning, we should connect these attitude concepts more directly to teaching struggling English Language Arts students in the online environment. It is the author's experience that many students in the online environment do not come with these attitudes in place. To improve our chances to change their academic situations, we must help them see that change is possible. Our students need to know that this experience is going to be different rather than more of the same. For this reason, we will insert a discussion of stress before going onto the rest of the Big Four.

Stress is part of everyone's daily life. "All of us have experienced *good* stress and *bad* stress" (Jensen, *Brain-Based Learning* 43). The real question is how we choose to deal with stress. To connect with attitude, the idea that simply a better attitude will turn every stressful situation into good stress is not realistic; however, considering the amount of research available to us in regard to attitude, some of which is referenced above, we can see that dealing with stress will affect the attitudes we are trying to develop in our students. Jensen makes an interesting distinction, "Stress is your bodily reaction to a perception, not reality. It occurs when you experience an adverse situation or person in such a way that you perceive you're out of control, or losing control, and your goals are compromised" (*Brain-Based Learning* 42). Note the beginning of that quotation "your bodily reaction to a perception, not reality." So the classroom situation in which a student experiences stress may not even be the reality of the situation. Fascinatingly, Branson, et al. studied stress in adolescents and declared, "Stressors have no inherent valence, meaning an individual's experience of stress depends on their appraisal of the demand. The resultant response can be differentiated into *distress*, the negative, undesirable, and harmful response to a stressor, and *eustress*, the positive, desirable, and advantageous response to the stressor" (2). So essentially, students sitting in the same classroom, receiving the same assignment may perceive that assignment in opposite ways—positive or negative. Add the online environment where the teacher is not physically present to notice signs of physical stress, and the potential for negative stress to distract from student learning is high. Table 1 is a concise listing of physiological, behavioral, and psychological stress indicators.

Table 1: Summary of the Phenomena in the Extant Literature as Effect Indicators of the Stress Response

Physiological indicators	Behavioral indicators	Psychological indicators	
		Cognitive	Affective
Distress			
• Accelerated heart rate	• Absenteeism	• Expecting the worst	• Anger
• Backaches	• Accident proneness	• Hopeless	• Anxiety
• Disturbed body states/ill health	• Aggression/ hostile	• Loss of motivation	• Apprehension/ dread
			• Doubt
• Exhaustion/ Fatigue	• Alcohol/ substance abuse	• Loss of recall	•
• Headaches	• Alienation/ withdrawal	• Negative thoughts	• Fear
• Loss of appetite	• Bullying and violence	• Racing thoughts	• Feeling out of control
• Muscular tension	• Changes in sleep patterns	• Reduced capacity for decision-making	• Frustration
• Physical weakness	• Dysfunctional / damaging / destructive	• Unfocussed	• Guilt/ shame
• Rapid/ shallow breaths	• Emotional outbursts		• Irritability
	• Hinders achievement/ performance		• Low self-confidence
	• Lower productivity		• Negative affect/ Sadness
	• Neglect of responsibilities		• Self-pity
	• Restless		• Worry
Eustress			
• Butterflies in the stomach	• Constructive and advantageous	• Alert	• Enjoyment
• Energized/ stimulated	• Enthusiastic engagement with the task	• Flow—in the zone	• Excitement/ exhilarated
• Healthy bodily states/ good health	• Facilitate achievement/ performance	• Focused	• Fulfilment
• Vigor	• Flourishing	• Hope	• Gratitude
		• Manageability	• Pleasure
		• Meaningfulness	• Positive affect
		• Meaningfulness	• Satisfaction
		• Motivation	• Satisfaction
			• Thrilling

Source: Table 1 in Branson, Victoria, et al. “How Do Young People Experience Stress? A Qualitative Examination of the Indicators of Distress and Eustress in Adolescence.” International Journal of Stress Management, 2018, p.3.

Note in particular the negative cognitive stress indicators that influence attitude: expecting the worst, hopelessness, and negative thoughts. As a student is experiencing distress, which can be sourced to anything in their life from school to home to relationships and beyond, "the brain is put on alert defense mechanisms and behaviors are activated, which is great for survival but not for learning" (Jensen, *Brain-Based Learning* 45). Returning to the table 1, we notice indicators such as loss of recall and reduced capacity for decision-making. Those cognitive indicators will have a direct effect on students' learning or even his or her propensity to learn. There are longer term effects as well. "Stresses placed on the developing individual by a mismatch between his or her capacities and demands placed by the environment will result in compensatory physiological responses and behaviors that in time may affect brain structures. This can be part of the learning process, or, if the mismatch is too severe, can result in pathology" (Lenroot and Giedd). As we commented earlier about experiences that drive positive change, we see that distress can drive negative change.

English Language Arts online teachers need to make sure to control what they can to reduce stress. Obviously, they cannot control stressors outside of school or outside of the course for that matter, but they can control what happens inside their course and classroom. Jensen writes, "Ensure that learners have the necessary resources and support to complete the assignments you give them . . ." (*Brain-Based Learning* 46). This may seem obvious, but struggling English Language Arts students may have skill or knowledge gaps that prevent them from completing tasks. For instance, in the online, synchronous classroom, the author has witnessed students struggle to save a file sent to them and open that file. Without this knowledge, they cannot be successful. Jensen continues by stating students experience undo stress for five reasons:

1. They do not perceive that a solution is possible
2. They do not have the necessary resources to solve a problem
3. They do no have a sense of control over a bad situation
4. They do not have the sufficient time to learn
5. They do not have the ability or awareness to manage their stress (*Brain-Based Learning* 46)

Thinking back on the situation previously described, the act of receiving and saving a file, for the student who does not know how to accomplish that task, can touch all five stress reasons. To explain, if students cannot perform the task, they do not have the necessary skills to solve the problem. As the file was shared in real-time, they do not have a solution to problem and their learning coach may not be present and/ or the teacher is unable for whatever reason to stop class and help that student individually. As the class is progressing, the student is missing out on instructions, and they are unable to do anything to remedy the situation—they have no sense of control over the situation nor do they have time to learn. Finally, they might be tempted to lash out, walk away from the computer, or simply log out because they do not self-regulate well. Online teachers have very little control in which their students go to school; however, they can control the accessibility necessary of resources needed for their students to be successful. In this provision, they can take steps to help reduce school-related stressors.

All three of these attitudes, learned optimism, growth mindset, and personal accountability are all part of the "Winner's Mind-set" (Jensen and Snider 41) which strives to create a positive thought process to help students succeed. Looking at the potential struggling online English Language Arts students which are likely to have skill deficiencies, credit deficiencies, and poor attitudes towards English class, we can see the importance of developing

this Winner's Mind-set" in our students. This mindset has the potential to help our students control their own brains, develop a growth rather than fixed mindset and take ownership of their education. Not only will these actions help in English class but also in all areas of their life to which they so choose to apply them. To be sure, these attitudes are a starting point, but without building skills at the same time, no significant change will occur.

Next will we will explore our students' abilities to learn to learn. Jensen and Snider refer to this idea of learning to learn as building capacity, or "the capacity to think, organize, and learn successfully" (57). It is one of their "Big Four" factors to help a struggling teenager. Jensen and Snider refer to several studies that indicate that executive function skills play a key role in many areas of life: school, reading comprehension, math skills, emotional development, vocabulary, and sociability (58-59). It is apparent that students who have these skills will do well in school. Dawson and Guare describe teens with executive skill issues this way,

> Youngsters with poor executive skills are disorganized or forgetful, have trouble getting started on tasks, get distracted easily, lose papers or assignments, forget to bring home the materials to complete homework, or forget to hand homework in. They rush through work or dawdle; they make careless mistakes that they fail to catch. They don't know where to begin on long-term assignments, and the put the assignment off until the last minute, in part because they have trouble judging the magnitude of the task and how it will take to complete it. Their work spaces are disorganized, and teachers may refer to their desks, backpacks, and notebooks as "black holes." Some youngsters with weak executive skills . . . have more to do with controlling behavioral excesses, like managing impulses or emotions, than with behavioral deficits, such as problems with planning, organizing, initiating, or completing tasks such as schoolwork (4).

Teachers reading this description may be thinking, “I know this student.” We all have students that meet this description to some extent. We will consider five executive skills, although there are many others. An executive skill or executive function is “a neuropsychological concept referring to the cognitive processes required to plan and direct activities, including task initiation and follow-through, working memory, sustained attention, performance monitoring, inhibition of impulses, and goal-directed persistence” (Dawson and Guare 4). The five we will consider are self-control, processing skills, attentional skills, memory skills, and sequencing skills (Jensen and Snider 58).

First, we will consider self-control which aligns closely with Dawson and Guare’s “inhibition of impulses” (4). Students, or any of us, have difficulty resisting temptation. “Humans can resist temptations by exerting willpower, the effortful inhibition of impulses. But willpower can be disrupted by emotions and depleted over time” (Crockett, et al., 391). If only resisting temptation were just that easy. Thinking about the concept of emotions disrupting will power, we can look back at Table 1. It listed a number of affective responses to negative stressors. Combining the idea of self-control with distress factors, we can understand the potential for our struggling students to give up. Their emotional responses to negative stressors erode their willpower to resist the temptation to quit. Fortunately, a number of strategies exist so we can help our students exercise more self-control. Jensen and Snider suggest a number of strategies; we will look at two. First, we can teach students how to continue with long-term goals, like posting pictures of the goal and student together, daily affirmations, and keeping track of progress. Second, help students develop “if-then statements” (Jensen and Snider 60). An example of an “if-then statement” could be, “If I am tempted to watch TV, then I will record the TV program and watch when I am finished with my work.” Crockett, et al. gives one more

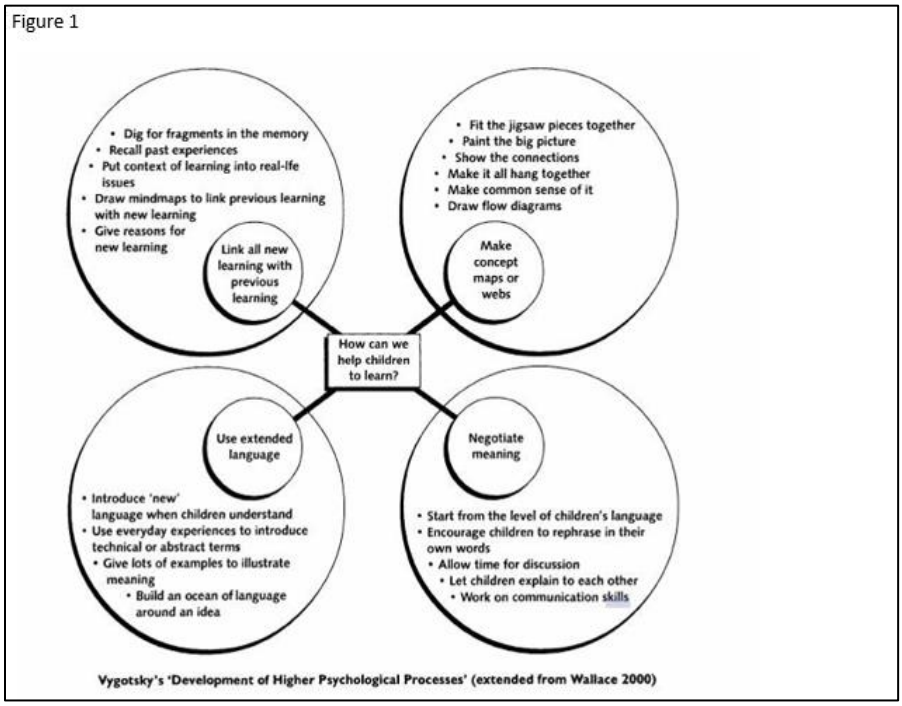
strategy, precommitment. Precommitment is when "people anticipate self-control failures and prospectively restrict their access to temptations…[e]xamples of precommitment include avoiding purchases of unhealthy food items and locking money away in savings accounts with hefty early withdrawal fees. Notably, precommitment often involves imposing costs for deviating from long-term goals" (Crockett, et al. 391). An example of precommitment for a student in the online environment may be having a gaming account password-protected with their parent or learning coach knowing the password, so they cannot access the account whenever they are tempted. All three of these strategies can potentially help a student resist temptation and stay on task. The idea of staying on task is particularly important in the English Language Arts online classroom because of the potential of longer projects from novel reading to process paper writing which require self-control on the part of the student to complete, and the teacher is not physically present to refocus the student to task.

The second factor is building cognitive capacity is to improve "process skills" (Jensen and Snider 61). Jensen and Snider go on to define processing as "they [the students] are doing mental work" (61). In other words, the students are thinking. Processing skills are thinking skills. A study done in Venezuela with 7th graders followed the instruction of thinking skills to 400 students. The results of the study showed positive benefits to this instruction (Herrnstein, et al., 1288). There is benefit to teaching thinking skills. We, as teachers, need to be reminded that "processing is not an innate skill" (Jensen and Snider, 61). We must teach and improve thinking skills. "All children can think, but thinking can be enhanced and developed through appropriate practice" (Wallace, "TASC: Thinking Actively in a Social Context." et al. 60). What constitutes appropriate practice? As English Language Arts teachers, we have the perfect example—the writing process. Jensen and Snider show us it is more than using the process with our students,

but rather, “Reinforce these steps until students have them memorized. Flesh out each one of these, and have the students both write about the model, what they have learned, and when they would use it and teach their classroom peers” (63). We use the writing process dutifully, but do teachers use it to this extent? Admittedly the author treats the writing process as a given, similar to a proven theorem in geometry, it is just true and works every time a student uses it. More thought needs to go into the process itself, not just teaching the process in order to achieve a piece of writing. The process has within it thinking skills instruction.

Build this idea of thinking skills a bit further, we will look the interesting theories of Vygotsky. Vygotsky emphasized “pupils learn when they can recall what is already learned, and then extend their existing mental maps to accommodate new learning. The skilled teacher is adept at finding the mental ‘hooks’ in learners’ existing learning schemes and then building from these” (Wallace, et al., *Teaching Thinking Skills* 9). The teacher needs to build on existing knowledge. An interesting visual display of these ideas are in figure one. Figure one makes Vygotsky’s theory practical and accessible. Beginning with the upper left circle (we will deal with the other three circles during the application portion of this paper), we see that new learning should be connected to prior learning. This concept of prior learning is collaborated through other research. Lent has a chapter titled, “Background Knowledge: The Glue That Makes Learning Stick.” (Lent). The metaphor of glue is a good one as it aptly describes the role prior knowledge has in learning. Lent continues, “Background knowledge is an essential component in learning because it helps us make sense of new ideas and experiences” Lent).

Figure one: Vygotsky's "Development of Higher Psychological Processes"



Source:

Wallace, Belle, et al. "Vygotsky's 'Development of Higher Psychological Processes" (extended from Wallace 2000)." *Teaching Thinking Skills across the Middle Years: a Practical Approach for Children Aged 9-14.* Routledge, 2012, p. 8. https://ebookcentral.proquest.com/lib/uwsp/detail.action?docID=1798322

Frankly, most English Language Arts teachers would agree with Gallagher when he writes,

> "More and more, my students are coming to me less and less prepared to tackle challenging text…I do not mean simply the literature and poetry…but also challenging nonfiction, speeches, textbook passages, primary source documents, newspaper and magazine articles and various forms of functional text…found in our state reading standards" (Gallagher *Deeper Reading* 8).

Gallagher reinforces the initial paragraphs of this thesis, students seem to be less equipped for the hard realities that face them. Rather than blame the students or previous teachers, Gallagher asks the following questions of himself,

- Have I given the student the proper level of support to make meaning from the text?
- Did I anticipate the needs of the student prior to assigning the reading?
- Have I supported this challenging reading assignment with the same attention and level of understanding I would if it were a challenging writing assignment?
- Did I simply "throw" this reading at the student?
- Am I *assigning* challenging reading or am I *teaching* challenging reading? (Gallagher, *Deeper Reading* 8).

These questions completely turn the conversation in a different direction. It is possible, especially in the online environment, to have completely disengaged students who did not take advantage of the reading support available; however, it is hard to answer "yes" to all those questions and still have a student not succeed to some degree. We need to be supporting our students in their approach to challenging reading. The ultimate goal is that students will be able to read critically on their own. The writers of *The Write Path* state it this way, "Ultimately, students need to be able to identify the pre-reading strategies that work best for them (or develop their own), so they move toward the autonomy that marks college readiness" (*The Write Path* 41). While this statement focusing in on one part, pre-reading, it is safe to expand the idea behind the statement to all critical reading, and, perhaps by extension, to thinking skills in general. We want our students to be ready for whatever the next step has for them.

Research into prereading tells us that causing readers to initiate and make connections with their prior knowledge through techniques such as previews and setting purpose by prediction have increased reading comprehension (Denner and McGinley 11). Prereading is or should be a standard practice in the English Language Arts classroom before reading a text. Consider this perspective on prereading:

> Prepping students for a reading task is an essential part of the Critical Reading Process and cognitively one of the most important—the brain has to receive signals to pay attention and to engage. It also needs preparation, so it knows where to "place" the new learning, where to create the new neural pathways (*The Write Path*, 41).

It is critical that we access student's prior knowledge or help them to develop prior knowledge. This background knowledge can take many forms: outdoor experiences when reading Jack London, chess vocabulary knowledge when reading about Bobby Fischer, or geography knowledge when reading current events. At points, a teacher may draw out this information with discussion. Some students will have little or no prior knowledge of a particular topic. Tantillo makes a great point regarding the need for establishing prior knowledge, "When students know nothing about a topic, they are understandably reluctant to answer questions about it" (55). It makes complete sense that a student who does not have anything to say will not say anything. With that in mind, some examples of prereading activities, in addition to those mentioned by Denner and McGinley above, are brainstorming, K-W-L charts and anticipation guides.

Another area where English Language Arts teachers can help access prior knowledge is vocabulary building. Marzano makes a direct statement, "[t]he research and theory strongly suggest that teaching vocabulary is synonymous with teaching background knowledge" (*Building Background Knowledge* 35). With this thought in mind, English Language Arts teachers need to be about vocabulary instruction. Considerable discussion exists on whether vocabulary instruction should be direct or indirect. Without going deeply into that discussion, the author favors a mixture of strategies that lean heavily toward direct instruction. Beers' statement echoes the author's experience,

> Some of us get creative and let students choose their own vocabulary words—those words that students were supposed to identify as new to them while reading their literary texts. This was supposed to provide ownership of the words and make vocabulary instruction more meaningful. It only took my struggling readers about one week to figure out that if they were honest and listed all the words they didn't know, they would have very long lists; so instead, they didn't choose any (176-7).

Struggling kids generally do not need to be told they are struggling or given activities that emphasize their struggles. Online English Language Arts Teachers need to use a two- pronged approach: first, provide direct instruction to help students develop their vocabulary, and second, help students develop the tools and resources they need to successful understand new words. Application of this idea will be developed later in this paper.

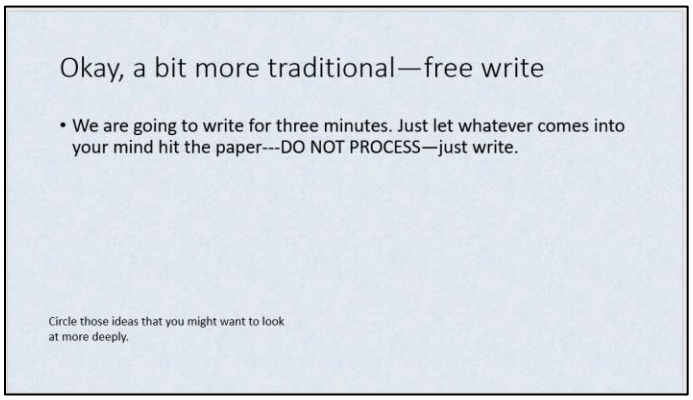
To conclude this section about teaching processing skills, we turn to Jensen and Snider as they discuss the following five-step model for teaching a processing skill:

1. Model it by showing your students how to do it.
2. Debrief and explain how you just did it.
3. Post the process you just modeled.
4. Give your students a new problem with guided practice.
5. Give students independent practice to solidify the process (61)

Initially, an online teacher could raise the questions, "What if not all my students are in synchronous sessions with me?" or "How do I post the process?" While following this model may present some challenges for the online teacher, those challenges are not insurmountable. Let us consider the Writing Process as an example. In a traditional setting, the teacher would simply

begin a writing project with pre-writing activities. In the online environment, the same process can happen. To illustrate, the author's class of struggling 10th grade students recently began writing an autobiographical incident. The teacher modeled the prewriting phase by use of application sharing (a function of the Blackboard platform) and using his phone as a document camera. As an example, figure one shows a PowerPoint slide that the author used as a freewriting prompt. The teacher and students all participated in this free writing activity.

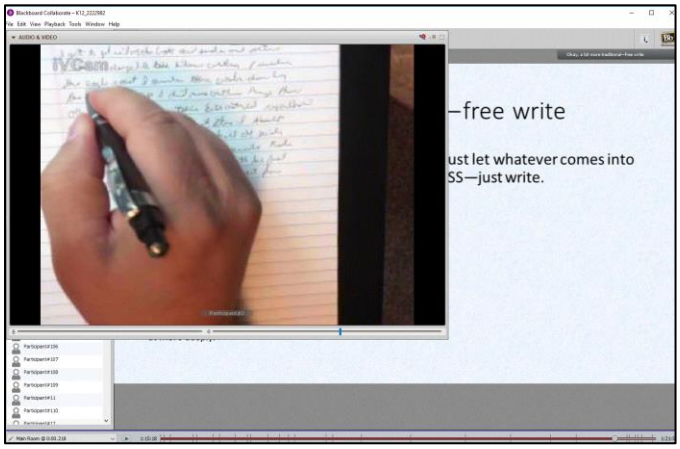
Figure 2: PowerPoint slide used in the author's 10th grade Literary Analysis and Composition 2 course for freewriting



Source: Dondlinger, Daniel. "Lesson 2.02: Planning an Autobiographical Incident." Literary Analysis and Composition 2. Literary Analysis and Composition 2 Class Connect Session, 27 Sept. 2018, McFarland, Dondlinger Online Classroom.

To debrief the activity, the author used his smart phone's camera to record him circling possible topic ideas. Figure 3 is a screen shot of the student's view of the author demonstrating how to use a free writing exercise.

Figure 3: The author demonstrating how to process a free writing exercise.



Source: Dondlinger, Daniel. "Lesson 2.02: Planning an Autobiographical Incident." Literary Analysis and Composition 2. Literary Analysis and Composition 2 Class Connect Session, 27 Sept. 2018, McFarland, Dondlinger Online Classroom.

As can be seen clearly, the online teacher, with some creative approaches, can aptly demonstrate the writing process for students in the online environment. The other phases of the writing process can similarly be modeled and processed for students. While the implementation of specific strategies to teaching processes, thinking skills, and background knowledge through prereading and vocabulary instruction, none of it will work if the student does not focus his or her attention on the it.

As a teacher, the author would say, "Pay attention" to a drifting student. Now he says, "Give me a smiley face if you can hear my voice" and dozens of smiley emojis appear on the screen. Regardless of the environment, we have realized the need for our students to focus on the topic we are presenting. The next step in building cognitive capacity is developing attention and focus (Jensen and Snider 64). This topic is one of acute concern for the online teacher because the teacher is not usually in the room with his or her students. More accurately, our students are paying attention, just not to the topic we to which wish them attend. Attention actually consists of three components: alerting, wide awake and responsive to environment; orienting, knowledge

of where and when you are, who you are with, and what is needed to perform the task at hand; and executive, tied to goals and eliminating distractions (Burns). Not surprisingly, Burns connects executive attention to school and life success. Looking at these different types of attention we can see why students can get distracted, particularly in the online environment. Part of the alerting-attention deals with the student's physical environment. This is one thing in which the online teacher has very little control. If their environment has many distractions, their alertness can be elsewhere, despite our best efforts. The most interesting part of the orienting-attention for the online teacher is the knowledge of what is needed to perform the task at hand. Taking into consideration many online students have skill deficiencies, specifically in English Language Arts those deficiencies are probably in reading and writing, and these students are in a remote location with possibly no adult immediately present, the urge to give up is very present because they do not have the knowledge of what might be needed to perform the task asked of them. As online teachers, we must be willing to meet students where they are and help them to orient their orienting-attention for the tasks we are asking. Finally, the executive attention involves

> coordination of our executive functions (goals, priorities, organization), emotions, and other cognitive functions like memory and knowledge so that irrelevant feelings or thoughts don't interfere with getting a job done. This kind of effortful control and self-regulation takes time to mature, and can be quite variable from person to person (and task to task) (Burns).

This idea of executive attention is something that a teacher may assume his or her students have some degree of control over already. Perhaps, to a certain degree, students may have this executive attention control. What is key here are the goals and priorities. If a student does not

prioritize school or have school-related goals, their executive attention will be focused on an entirely different set of goals and priorities than the academic task on hand. The idea of student attention is not that students do not pay attention, it is that they are not paying attention to the topic in which we, as teachers, wish them to pay attention.

Thinking about helping students focus on academic tasks, we must understand some basic things about the brain. The brain is not designed to focus on one thing for long periods of time nor at the same intensity. Jensen states, "the brain is not designed to work as 'on or off.' Its intensity and capacity vary throughout the day and night . . . This understanding means that it's not very well designed to be focused, locked in, and riveted on class work for six hours a day" (*Brain-Based Learning* 24). If we take this understanding to heart, we do school incorrectly. In many cases, we are asking students to do something that they are not biologically designed to do: sit in one spot and pay attention. This situation can be magnified in the online environment where a student is sitting in one place, looking at a computer screen for an hour, but what if that student has multiple classes in succession? That student could be sitting in place for hours with the only change being the voice of the teacher.

Additionally, the brain has several cycles that it goes through during the day. While we could discuss sleep cycles, that is not an area a teacher can control; however, a number of processes cycle about every 90 minutes. One is the Ultradian cycle which is a high energy to low energy to high energy cycle (Jensen, *Brain-Based Learning* 24). As we observe students, or ourselves for that matter, we see students at various stages of attention from drowsy to fully engaged. As they progress within this cycle, students will vary in their state of alertness. Additionally, the brain alternates between verbal and spatial processing. Jensen cites research that indicates student verbal-task scores and spatial task scores can vary significantly depending

at what part of the cycle the student is tested (*Brain-Based Learning* 26). Just this cycle should give teachers pause. Potentially, our students could do better if we just simply are aware of their natural brain cycles and test them accordingly! The online teacher has a distinct advantage here; most test-taking is done asynchronously by students, so they could choose a time to test when their brain is cycling toward verbal processing.

A number of other strategies are available for the online English Language Arts teacher. One idea is to provide hints and teasers before the actual activity. "Prime the learning with small hints, appetizers, and teasers days or minutes ahead of time to create a pre-attentional bias toward the content (Jensen and Snider, 65). For instance, a British Literature teacher could read or play a short recording of Chaucer's *The Canterbury Tales* in Middle English prior to studying it. Marshall observed, on coaching a new teacher, "Many new teachers don't yet realize the importance of engaging students' interest and attention before the more rigorous work begins." Teachers need to work hard to make connections to their students' interests. Admittedly, this is a challenge for online teachers. By virtue of the environment, the student and a teacher do not interact outside of the classroom to any great degree. How can an online teacher learn a student's interest? A solution is autobiographical writing in a variety of settings. The author has used formal writing, like a personal narrative or autobiographical incident; semi-formal writing, "Introduce Yourself to the Class" asynchronous discussion boards within the learning platform; and informal writing in the synchronous classroom like "Everyone Write Something That You are Proud of the whiteboard." Additionally, the author opens the synchronous classroom 15 minutes early to talk to students and holds regular office hours where students are encouraged to stop in and say "Hi." All of these methods will help the online teacher get to know his or her students' interests. A second method of focusing student attention is to pay attention to the brain.

As was stated in the previous paragraph, the brain is not designed to focus for long periods of time. Students need time to process the content to which they just were exposed. Jensen states, "much of what we learn cannot be processed consciously . . . [i]nternal time is needed to process information and create meaning" (*Brain-Based Learning* 28). The brain needs a break! Online teachers can be particularly guilty of continuous speaking. Recall how earlier we saw that Murphy, et al. found that online instruction tended to be lecture-based, instructor oriented (585). Combine this general method of instruction with the fact that teachers cannot, in many cases, see their students. Online teachers do not have the visual cues from students that would indicate confusion, frustration, fatigue and so forth. Because these cues are not available to online teachers, most, if not all the time, during instruction, they must intentionally build breaks into their instructional cycles. Jensen suggests, "In working with adolescents, limit content sessions to 10 to 15 minutes each . . . [a]fter each focused learning period, conduct an elaboration activity, such as mind mapping, pair shares, or model building" (*Brain-Based Learning* 29). Taken to heart, for a 60-minute scheduled class session, a teacher should break four to six times. Jensen also points out that the break does not have to be free time, but rather can a shift in activity, for instance mind-mapping or project work (*Brain-Based Learning* 28). The online teacher would plan four to six activities to give the student a chance to process the content. Watanabe-Crockett suggests the 10:2 method, give students two minutes to process for every 10 minutes of instruction (Watanabe-Crockett). The author has recently implemented Cornell Notetaking in his classroom. At the end of each instructional content session, he gives the students two minutes to review their notes, ask questions, and create self-generated questions to be used in their own study. While not every teacher has implemented structured notetaking, pausing to have students look over their notes to be sure they understand them can only help their learning.

The next aspect in building cognitive capacity is building working memory. It is possible that an understanding of working memory could transform the way an English Language Arts teacher views his or her students. Cowan defines working memory as "the relatively small amount of information that one can hold in mind, attend to, or, technically speaking, maintain in a rapidly accessible state, at one time (1). This idea can explain so much of our struggling students' situation. They have a finite amount of information that they can use easily and quickly at any given time. Cowan offers the example of someone being tasked to go to another building and get a book; he gives at least five details need to retrieve the book that must be held in the working memory in order for that person to be successful in the task (2). To translate this example to the classroom, a simple request like complete a worksheet is a potentially complicated request to complete. First a student has to identify the assignment and then the part of the class where it is most likely to be stored. For that point, the student then must remember what the title of the file and how to download it. Finally, the student must remember where he or she saved the file, retrieve it, open it, and, possibly, re-save it under a different name so that his or her work can be saved in it. The task here was oversimplified as the multiple clicks, scrolling, and so forth were not mentioned. For the online student, just getting ready to work on the assignment could possibly strain his or her working memory. By way of informing us of just how limited working memory is, Cowan tells us, "A key working memory mechanism appears to have a capacity of about three or four chunks in the average young adult…the capacity appears to vary from about two to six chunks" (49). Chunks, to Cowan, at the units that are held in the mind and cannot be easily counted (8). Observing that the chunks can vary in size and capacity and the number of chunks very between individuals, we then realize that any given task will stretch the working memory of some beyond capacity and others could handle a couple more

chunks of information. While making generalizations is a dangerous proposition, if we bring forward the idea that online charter schools, particularly in Wisconsin due to charter priority, attract struggling students and struggling English Language Arts students particularly, working memory limitations may play a proportionally larger role in the reasons why these students struggle. How do we arrive at this conclusion? Baddeley gives us some insight,

> There is no doubt that working memory does depend on activated long-term memory in many ways . . . The capacity to remember a string of unrelated words is about five items, but if they comprise a meaningful sentence, the span is around 15 words, reflecting a contribution from grammar and meaning, both depending on different aspects of long-term memory. Hensel, it is unsurprising that neuroimaging students of short-term or working memory tasks also tend to activate areas associated with long-term memory (R140).

While Baddeley and Cowan debate the finer points of whether working memory is part of the short term or long-term memory, we, English Language Arts teachers, note the mention of long-term memory. It is clear that working memory is related to long-term memory, regardless if neuroscientists feel that it is part of long-term memory or not. We have previously examined the role of prior or background knowledge to student success. In the working memory, we see further connection, and possible dependence on, prior knowledge. Going back to the example of the student finding a worksheet in the online environment, let us change the scenario a bit and assume it is the student's very first time in an online learning platform and is trying to download a worksheet for the first time. We first saw that the student has to identify the assignment. This student does not have any prior knowledge to guide him or her. What does an assignment look like in general, never mind the specific one? Where is that assignment likely to be stored? What

was the title of the file? What is the procedure to download it? We could go on, but the point is clear—working memory depends on prior knowledge. When that prior knowledge is not present yet, where does the student inform his or her working memory? While prior knowledge is important and interestingly connected to working memory, a more important connection to the English Language Arts classroom must be made—reading. Daneman and Merkle "confirmed the high correlation between working-memory capacity and language-comprehension ability" (qutd. in Wickelgren 1581). This correlation makes a great deal of sense. To process language and make sense of it, we must be able to remember the words already spoken or read to connect to those still to be read or heard and then combined to make meaning. Think of the struggling student who has decoding difficulties. With much effort and working memory being expended in decoding words, how much working memory is left for comprehending what is read? It is unlikely that developing working memory is going to solve all reading problems; however, if there is a limit to how much the brain can access immediately, it would follow that using that working memory on decoding would leave less working memory available for comprehension. Additionally, Swanson and Berninger conducted a study with 900 students grades one through nine and concluded "this study supports to claim that individual differences in writing ability appear related to individual differences in working memory" (383). Without dwelling further on working memory, it is apparent that working memory plays a role in all aspects of English Language Arts instruction. We will now look into strategies to build working memory.

While there are a multitude of sources available suggesting strategies for building working memory, many of those strategies are limited by our online environment. The first challenge is diagnosis. Clearly, we are not suggesting that a teacher diagnose any medical or cognitive disabilities; however, it is helpful to have an idea with what issue one is dealing. Katz

asserts that students with a memory problem have been "described as inattentive, as daydreamers, or poorly focused" (6). So, what does a working memory problem look like? The following errors are listed by Gathercole and Alloway as potential working memory failures:

- Incomplete recall, such as forgetting some or all of the words in a sentence, or of a sequence of words
- Failing to follow instructions, including remembering only the part of a sequence of instructions, or forgetting the content of an instruction . . .
- Place-keeping errors—for example, repeating and/ or skipping letters and words during sentence writing, missing out large chunks of a task
- Task abandonment—the child gives up a task completely (15)

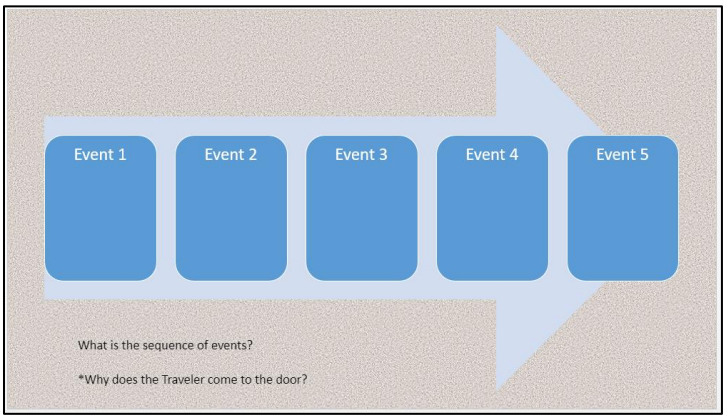
Obviously, these errors can be attributed to other factors apart from working memory failure. As classroom teachers, we are not qualified to diagnose such conditions. Rather, Gathercole and Alloway two strategies for the classroom teacher. First, examine the task to determine if too much is asked of the students' working memory, adjusting if appropriate (Gathercole and Alloway 15). Second, the teacher monitors the student and ask questions to search out details as to what the student is doing currently and going to do next, looking to see if the student has forgotten crucial information (Gathercole and Alloway 15). While that is helpful for the individual student, the reality is that in the online environment, it is difficult to rule out other factors such as audio learners versus visual learners, technology issues such as connection lapses at inconvenient times and software/ platform freezes. All of these issues plus others have afflicted the author and his students at some point. Any one of these could cause an error that resembles a working memory issue. Gathercole and Alloway suggest a number of strategies that can work class wide in the online environment. The most obvious suggestion is teacher notes on

the class white board (18). Teacher notes are considered obvious because most synchronous platforms have the ability to display PowerPoint slides. In fact, if an online teacher did not produce slides for the whiteboard, the synchronous session would become a radio broadcast. A second suggestion is to simply repeat important information (Gathercole and Alloway 17). While this sounds obvious, it is not. The online teacher can repeat important information in several ways: visually on the white board in synchronous session, verbally on the microphone in synchronous session, file transfer of the information in synchronous session, posting the information visually in the asynchronous classroom announcement, adding an assignment sheet to the online lessons, and sending email to both the student and their parent/ learning coach. Third, break the task down in to component parts where possible (Gathercole and Alloway, 18). The author has heard this particular instruction given in any number of courses and as an accommodation in individualized educational programs. Breaking down a task is a strategy of which most teachers are aware; they just need to implement it. Jensen and Snider recommend a folder activity where students take turns saying words from the same "folder;" for instance, if the "folder" is birds, students take turns adding words to list from that folder: first person, bald eagle; second person, bald eagle, robin; third person, bald eagle, robin, hawk; and so forth (68). For the online English Language Arts teacher, perhaps those folders would include nouns (or other parts of speech), literary terms, novels, authors, et cetera. The author has created concentration games by placing moveable objects on the whiteboard to cover words and definitions. Students then take terms matching the pairs.

The final area in Jensen and Snider's cognitive capacity building is sequence building (69). At first, the inclusion of this skill was a puzzlement. Why sequencing? They elaborate, "To sequence a task, you'll need background knowledge, the ability to prioritize, prediction skills,

and speed of processing (Jensen and Snider 69). Essentially, in sequencing, we find all the other skills of building cognitive capacity. The most obvious sequencing opportunity would appear to be following a short story or novel's plot. Figure four demonstrates a storyboard the author has created.

Figure four: sequence chart by the author using Microsoft SmartArt in PowerPoint



Source: Dondlinger, Daniel. "Lesson 1.04: "Inchape Rock." Literary Analysis and Composition 2. Literary Analysis and Composition 2 Class Connect Session, 13 Sept. 2018, McFarland, Dondlinger Online Classroom.

Another natural place to use sequencing is the writing process. Helping students not only understand that prereading proceeds drafting, but the English Language Arts teacher also can help his or her students logically create a writing that progresses from introduction to body to conclusion. Jensen and Snider give several ideas: have student build something, give directions only 50 % of the time and give them a list of steps out of order for them to sequence, and give five to seven sentences out of order and have them create a story (70). Thinking in the online environment, some of these final suggestions, especially regarding directions, make the author shudder. Misunderstanding seem to happen daily because we are never sure we have a student's undivided attention. The final suggestion would be easily accomplished in the online classroom.

In fact, by creating moveable sentences, the students could manipulate the sentences into the story order as they wish the sentences to be.

The last of Jensen and Snider's "Big Four" is fostering student effort (75). This is one area that all teachers seem to desire improvement in their students. Interestingly, when studied, "teachers are among the most powerful influences in learning" (Hattie, *Visible Learning for Teachers* 22). As we look for ways to improve our students' effort, we may look in a mirror for the solution. Hattie builds the intensity of the statement by stating that teachers have a more influence on the way a student turns out than any other single variable (qutd. in Jensen and Snider 76). We teachers have the impact and influence necessary to affect our students. Do we use this great influence to their benefit?

The author's experience as an instructional coach has led to interesting discussions with teachers regarding student effort and motivation. Those discussions ranged from teachers assuming almost all the responsibility for student motivation to taking almost no responsibility. A middle course needs to be steered in regard to student motivation. Pink states that "nobody exhibits purely Type X or Type I behavior every waking minute of every living day without exception" (76). In other words, no one, including any one of our students, exhibits a motivation which is solely based extrinsically (Type X) or intrinsically (Type I). Our students will, perhaps in the same class period, demonstrate both types of motivation. Pink also asserts that the Type I behavior is "both born and made" (77). Essentially, a student might be naturally inclined to be motivated intrinsically, or not; but the mindset can be encouraged and grown. This position reminds us of Dweck's growth mindset and brain-based research which we viewed earlier that tells us students literally can change brains. Pink asserts the Type I behavior thrives with the

following three factors: autonomy, mastery, and purpose (78). Note that Pink is not writing with an eye to education, although his book does deal with some ideas for education. His focus is business productivity. While there are some great differences between business and education, teacher still want their students to be productive, ultimately learning those college and career ready skills mentioned earlier. Is there application for these concepts? Yes—first, let us define the terms as Pink defines them.

"Autonomy . . . is different form independence. It's not the rugged, go-it-alone, rely-on-nobody individualism of the American cowboy. It means acting with choice—which means we can be both autonomous and happily interdependent with others" (Pink 88). This definition is a bit colloquial, but it delivers an understanding of the concept, to be autonomous in this sense to be self-directed choosing tasks and paths within a framework, perhaps a group, or in the case of school, within an assignment or task. In speaking of key components of a reading workshop, Miller states, "Students need to opportunity to choose reading material for themselves" (16). Too often in our classrooms, students only read their assigned reading without being given much choice in the material they read. Scieszka encourages parents and teachers to "give children much more freedom to choose what they want to read rather than what adults think they should read" (qutd. in Gallagher, *Readicide* 84). The idea presented here is that students would benefit from a sense of autonomy by given some choice in what they read. Does that mean that a teacher should never read a book together as a whole class? No. In the case of whole class readings, autonomy may come in the form of a culminating project. Writing instruction also encourages autonomy. "Every secondary English classroom should have regularly scheduled time when students can work on writing projects of their own choice" (Zemelman and Daniels 71). One last thought before moving to mastery: "Control leads to compliance; autonomy leads to

engagement" (Pink 108). As English Language Arts Teachers, we seek engagement not compliance.

Second is mastery, which is defined as "the desire to get better and better at something that matters" (Pink 109). Let us unpack that definition. There is a desire or a "want to" on the part of the person. This component is sadly missing from many English Language Arts students, especially those who struggle. It has been the author's experience that students do the minimum. One reason for is this is "[m]any of these everyday activities such as school-related activities and work-related activities are not activities typically engaged in voluntarily for fun (i.e., intrinsically motivated) but out of obligation or necessity (e.g., Graif, Ciskszentmihalyi, & McManama Gianinno, 1983)" (Abuhamdeh and Csikszentmihalyi 317). While the results of this research probably will not be viewed as groundbreaking by English Language Arts teachers, it does point to the ongoing issue of student effort and motivation; basically, many of our students just do not have any—or do they? The same authors performed a research study where they asked middle and high school students to record what they were doing at random times during the day. They realized that activities that were goal-directed and intrinsically motivated, perceived challenge was a predictor for enjoyment over perceived skill. The high challenge maybe a reward to itself if there is low anxiety over performance (Abuhamdeh and Csikszentmihalyi 326). Examining that study, one possible application for English Language Arts teachers with struggling kids is to lessen or remove the performance anxiety. Of course, the study results revealed another factor that English Language Arts teachers have been aware for quite some time: distractions. Abuhamaheh and Csikszentmihalyi found "participants indicated they were engaged in a secondary activity concurrent with the primary activity (e.g., working on homework while playing a video game), and that there some indications that these observations were associated

with a lesser enjoyment of challenge than when attention was focused exclusively on a single activity" (Abuhamdeh and Csikszentmihalyi 326). It is no surprise that an activity may be enjoyed less if the student's attention is not solely focused on it. How does this research relate to mastery as Pink defines it and, by extension, to the English Language Arts classroom? One of the authors of the study, Csikszentmihalyi, introduced a concept called "autoelic experiences," or flow, in the 1970s (Pink 112). Flow has several components: the goals are clear, the relationship between what a person had to do and what he could do was perfect, and the person is so deep in the moment and in control that they lose sense of time, place, and perhaps self (Pink 113). This perfect balance, this flow, is what we seek for our students. They sink deep into their work with a balance between their abilities and challenge with the goal clearly in mind.

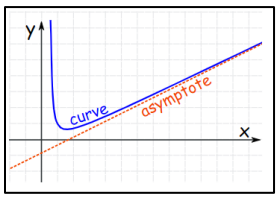
Any English Language Arts teacher would say that is great, but does not happen frequently; how do we work on mastery in the classroom? To build on this idea, Pink outlines Three Laws of Mastery (118). These laws are simple and direct:

1. Mastery is a mindset (Pink 118).
2. Mastery is a pain (Pink 121).
3. Mastery is an asymptote (Pink 124).

Admittedly, these three laws seem to be a bit of an anticlimax. After the discussion of flow, one would almost think we were going to give our students the location of Shangri-La. In actuality, Pink turns us back to Dweck with the idea of mindset. He applies her work with performance goals versus learning goals. This is where the English Language Arts teachers need to be alert. Performance goals, like getting an "A" in English, are for straight forward items but Dweck found that "it inhibited children's ability to apply the concepts to new situations" (Pink 120).

Learning goals differ in that a skill or knowledge set is being developed for the long-term. For instance, a learning goal could be the ability to write a complete sentence. Pink tells us that students with learning goals were able to transfer their knowledge to related situations (120). Further, this idea of pain brings us to a concept known as "grit." This concept recently was popularized by Duckworth when she defined grit as "the passion and perseverance essential for achievement of long-term goals; it can also involve working through challenges, over a period of years, against tremendous odds, and despite periods of plateaued progress (Duckworth, et al., 2007)" (Reed and Jeremiah 252). Without delving into the differing opinions on the importance of grit, and a lot of discussion exists, we will summarize that a certain amount of perseverance needs to be employed for any one of any age and stature to complete any task. Ultimately, for this reason, Pink uses the term and concept of grit to describe that part of a struggling student's personality that allows he or she to be successful despite obstacles. We can accept that this part is present for struggling English Language Arts students as they strive to develop missing skills and fill in gaps in knowledge. This process could be described as painful in many dimensions measured in time, effort, and so forth. The final law is most interesting because it is frustratingly true. Pink declares mastery as an asymptote, or "a straight line that a curve approaches by never quite reaches" (Pink 124). The following illustration helped the author conceptualize this idea:

Figure five: An asymptote is a **line** that a curve approaches, as it heads towards infinity:



Source: "Asymptote." *Math Is Fun*, MathIsFun.com, 2016, www.mathsisfun.com/algebra/asymptote.html.

The realization that one has when they approach mastery is that mastery cannot be completely achieved no matter how much a person focuses on it. Pink tells us that this is a source of frustration as well motivation (125). As an example, think of athletes, musicians, artists, and others that strive to be masters in their field but yet there is always some aspect of their craft that can be improved. Pink concludes with this thought, "mastery attracts precisely because mastery eludes" (125). Connecting this idea of mastery with the previously discussed concepts of Seligman's learned optimism and Dweck's power of "yet" has the potential to create a powerful learning force within our struggling English Language Arts students. Imagine if these students were able to develop these ideas simultaneously. They would see great gains. The English Language Arts teacher needs to help the students understand two things. One, the content matters. Two, they can learn it.

The final component of the Type I behavior is purpose. The concept involved is more than having goals, although that is certainly part of it. Csikszentmihalyi said, "Purpose provided activation energy for living…people who had a sense of doing something beyond themselves" (qutd. in Pink 132). These statements get to the heart of the matter. People want to do things that matter. We would add, so do our students! For years, English Language Arts teachers have been encouraged to give their students opportunities to publish their writing for a wider audience. Murray wrote, "There is simply no comparison between the artificial, academic situation of classroom publication and the chance to achieve the readership of 'real' people" (qtd. in Rodesiler and Kelly 22). Many of the author's English education professors stressed the importance of "authentic" audiences for student writing which is the equivalent of Murray's identification of "the readership of 'real' people." Many of our students, similar to the rest of us, have a desire to do something important, beyond us. Authentic writing will help accomplish this

desire. The very process of writing for an audience wider than the teacher forces students "to make decisions about and in light of their audiences and purposes, the mode and media, and the situation of the writing event" (Rodesiler and Kelly, 23). Just by providing our students with a wider audience, they can achieve a sense of purpose greater than the best designed academic writing assignment.

How does this Type I behavior relate to our struggling English Language Arts students? By encouraging them to seek to get "better at something that matters" (Pink 109) while adding some autonomous decision-making ability and an authentic purpose, our students could potentially begin to be motivated intrinsically rather than extrinsically. Pink has a list of ten ideas for helping parents and educators (185). Not all of these ideas translate well to the online environment, but, five do; however, we will only look at one. Pink as three main questions for teachers to ask themselves about homework:

- Am I offering students any autonomy over how and when to do this work?
- Does this assignment promote mastery by offering a novel, engaging task (as opposed to rote information of something already covered in class)?
- Do my students understand the purpose of this assignment? That is, can they see how doing this additional activity at home contributes to the larger enterprise in which the class is engaged? (Pink 186)

These three question sets offer the teacher a self-check that leads toward Type I behavior. Keep in mind that the closer to Type I behavior a student operates, the more intrinsically motivated he or she is likely to become. The teacher should then use these questions to examine their own practice to discern if they are promoting Type I behavior.

Seven other ideas for fostering student effort are discussed by Jensen and Snider. All are directly applicable to the online environment. The first is ongoing formative assessment (Jensen and Snider 76). The operative word is *formative*. Formative assessment is "assessment which is deigned to provide feedback to the learner in order that they may improve their performance" (S. Wallace). Teachers need to engage in assessments that help the students understand their own learning. This assessment can take many forms such as ungraded quizzes, Think-Pair-Share, and 3-2-1 Countdowns. It is in this feedback that the student can adjust their learning and improve. Hattie identified formative assessment as the third highest impact practice by teachers (*Visible Learning: A Synthesis* 181). We also want to make it clear that although we advocate students informing their own learning from formative assessment, that in no way takes away from the teacher's use of formative assessment to inform classroom practice. Jensen and Snider state, "you are using the evidence of learning (of lack of it) to adjust instruction" (77). Teachers must change their educational practices not just week to week, or day to day, but also within a lesson with formative assessment. Dylan Wiliam suggests that teachers use the practice he calls a hinge question. Wiliam explains the hinge question like this:

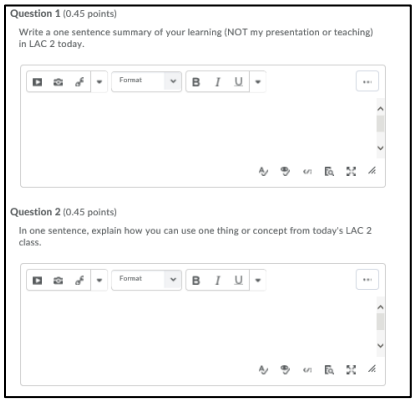
> . . . the teacher identifies a particular concept that will be important for students to understand before moving on to other parts of the lesson. Of course, there are many such points in a lesson, but at least to start, choose one point somewhere in the middle of the lesson. At this hinge, the teacher asks a hinge question to check that the class has understood the key point of the lesson and gets a response from every single student. Depending on those responses, the teacher either moves on or goes back to review the material (41).

Using this concept, the teacher could place a hinge question in her lesson to formatively assess student learning mid-lesson *and make educational adjustments*. This whole concept of formative assessment has implications for both the teacher and the student. Each has a vested interest in knowing what learning has or has not happened and formative assessment allows each to know and make changes.

Second, with little surprise is engagement. Jensen and Snider phrase it this way: "high engagement with reciprocal (peer) teaching" (79). Few teachers, especially online teachers, would disagree that engagement is crucial to student success. Hattie cites a definition of engagement from meta-analysis by Kumar in 1991stating, "Engagement . . . was defined as the effective time within allocated science class that a student actively participated in learning—such as experimenting, attending, participating in discussion, questioning, answering, and taking notes" (*Visible Learning: A Synthesis* 49). Notice the key words of the definition: "a student actively participated in learning." For our students to be engaged, they must be doing something, and all the above-mentioned activities happen in the English Language Arts classroom, including experimenting. To clarify, we are not suggesting that we co-teach chemistry; however, if our writing and reading instruction is running well, our students are experimenting with audience, genre, and style. Jensen and Snider cite a study that shows keeping students in productive emotional state is critical as well (79). This would lead us to the conclusion that attitude toward school is important as well. Hattie supports this idea when he writes. "Engendering a positive attitude to school work may be both a precursor to greater engagement and a worthwhile outcome in itself. It seems achievement plus effort plus engagement are keys to success in school" (*Visible Learning: A Synthesis* 49). Unpacking the ideas contained in these two sentences give any teacher something to think about. Essentially, Hattie identifies the three items

in which many struggling students in the online environment arrive to the online school deficient. As established earlier, many of these students have not experienced academic success—achievement is not there. Further, the effort they have invested thus far has not produced, so they are reluctant to invest more. Finally, the distractions and stress of their situations make school engagement difficult. The online teacher faces challenges in engagement, which is not to say the traditional classroom teacher does not; however, the logistics of the online environment allows students to avoid direct intervention. The old adage, "Try it, you might like it," seems to apply here. Jensen and Snider quote studies that show engagement can create anticipation and excitement while decreasing boredom (80). This would make sense that engagement would do these things, returning to the Kumar's definition, if a student is actively participating, they would rarely be bored because they are doing something. Jensen and Snider write succinctly, "Kids who are engaged simply put our more effort" (80). How do we increase student engagement? Some strategies exist. First, Jensen and Snider suggest asking the student about what they have learned. The author uses an exit ticket quiz at the end of each live session that asks that simple question. This is a simple and direct way of helping a student reflect on his or her own learning.

Figure six: The author's exit ticket quiz following live class sessions



Source: Dondlinger, Daniel J. "The Author's Exit Ticket Quiz Following Live Class Sessions." *Literary Analysis and Composition 2*, K12, Inc., Oct. 2018, learning.k12.com/d2l/home/425469.

Looking at figure six, an online teacher can easily help students reflect on their own learning. Jensen and Snider also suggest reciprocal teaching. Stricklin defines reciprocal teaching, "Palincsar and Brown (1986) created reciprocal teaching, which uses the four strategies of predicting, clarifying, and questioning, and summarizing to increase comprehension" (620). Through this process, students develop new strategies for reading comprehension. Stricklin encourages teachers to have their students reflect and discuss which strategies worked best for them (620); Jensen and Snider go one step further and encourage teachers to have their students teach one another their new skill (80). In either case, the ability to reflect and think about their own learning will increase their own arsenal of strategies to increase their reading comprehension. To connect to the topic of engagement, remember that Hattie attached achievement engagement. Students seeing success is achievement, even in small steps.

The third idea for fostering student effort may be the most important—relationships, both between student to student and teacher and student (Jensen and Snider 82). Of all the student effort factors, this may be the most important for online teachers particularly. Due to the nature of distance learning, students can feel isolated. This lack of non-academic, peer interaction needs to be addressed by online schools. "Overcoming this perceived sense of social isolation for full-time online learning programs is a major challenge that many cyber schools struggle with" (Barbour and Plough 56). The author has had students express this very real sentiment to him. While Barbour and Plough's article discusses the use of social media to address this need for student to student interaction, that option is not available to the author's school. Yet within the school day, a few opportunities exist in the online environment to give students a chance to interact outside the social sphere. A teacher could open his or her room early for a live class

session or allow the room to be open after class has concluded. A teacher could also hold office hours and allow students to gather in his or her virtual office and socialize. Finally, if inclined, a social "class" could be written into the school schedule. All these ideas can lead to more non-academic student interaction. The second relationship to be considered is that between teacher and student. Hattie ranks teacher-student relationships as the 11th ranking influencer of student achievement (*Visible Learning: A Synthesis* 118). When one considers that Hattie and his colleagues catalogued over 130 different items influencing student achievement, ranking 11th is quite significant. Hattie expands on this thought in *Visible Learning for Teachers*, when he says,

> One simple way in which to turn students off learning is for them to have a poor relationship with the teacher. The essence of positive relationships is the student seeing the warmth, feeling the encouragement and the teacher's high expectations, and knowing that the teacher understands him or her (158).

Without mincing words, Hattie calls all teachers to attention—relationships with the teacher makes the difference. The last line of the preface of *Visible Learning for Teachers* is simply, "Know they impact" (ix). The relationship between teacher and student needs to be positive. There are several ways that this relationship can be developed, even in the online classroom. Referring to the earlier suggestion of opening a classroom early to allow the students to socialize, the teacher should join them. Jensen and Snider exhort teachers to "[l]earn something every day about your kids" (82). While this may be a tall order for an online teacher due to class size and distance, the statement can be changed to learn something about your kids every week. If attendance is a problem, a phone call home can help a teacher learn something about his or her students. Another suggestion by Jensen and Snider is to "know all the students by name and refer

to them by name in class" (83). This is great advice. The author routinely has 80 or more students per online class session. He makes it a point to greet every student by nickname, remembering to be sensitive to nontraditionally identifying students, as they arrive until the lesson begins. He adopted this practice from Lemov's Threshold technique; Lemov adds that this is an opportunity to build rapport by mentioning something pertinent to the student, such as, "Enjoyed your paper" or "How was your dance recital?" (197). The final way a teacher can meet with a student is a one-on-one conference. While this opportunity exists in the traditional classroom as well, the online teacher can schedule one-on-one meetings in the online classroom at a moment's notice. Students with immediate need potentially can meet with their teacher immediately. The online English Language Arts teacher has one other strong way of developing the teacher-student relationship—personal writing assignments. As writing teachers, we learn much about our students through their writing. The online environment definitely has its challenges for developing good teacher-student relationships in terms of distance and technology; however, there are also great opportunities for the online teacher who makes the effort to build those relationships.

The fourth idea for fostering student effort is teaching for mastery with clarity and challenge (Jensen and Snider, 83). This idea corresponds with the previous discussion over Pink's findings on mastery and challenge. As this topic has been previously discussed, it is enough to bring Hattie into the mix when he writes, "The performance of the students who have the most challenging goals are over 250 percent higher than the performances of the subjects with the easiest goals (Wood & Locke, 1997)" (*Visible Teaching: A* Synthesis 164). Considering this statistic, this statement is definitely worth repeating—students need teachers to set high goals and teach for mastery.

The fifth idea for fostering student effort is comprehensive, targeted interventions (Jensen and Snider, 88). Simply put, an intervention is supplying small group or individual help to an area of an underperforming student's need. Another related term used in education is differentiation, an approach where teachers tier instruction and curriculum to meet the needs of all students (Jensen and Snider, 88). Defining interventions can be challenging. A simple internet or library catalogue search will yield a multitude of types and descriptions of interventions. For our purpose, we will consider interventions directly associated with content or classroom skills. Bambrick-Santoyo, in *Driven by Data A Practical Guide to Improve Instruction*, discusses how to develop an action plan to help increase student achievement, particularly on standardized tests. One of his action plans, describes using differentiated instruction as a "powerful tool . . . and . . . can greatly enhance most lessons (Bambrick-Santoyo 78). Differentiated instruction will help all of our students, but will greatly benefit our struggling students. Hattie examined the effect of comprehensive interventions for learning disabled students and found this strategy to be very effective—7th on his list (*Visible Learning: A Synthesis* 217). The reality of struggling English Language Arts students online is that they have not been diagnosed with or do not have a learning disability. So, does this strategy still work? Hattie continues, "Even when meta-analyses were completed with students across all ranges of ability, the effects [of comprehensive interventions] were still high for the lower ability students" (*Visible Learning: A Synthesis* 218). Targeted instruction is definitely a strategy to use with our struggling students. As previously stated, we will deal with only type general types of interventions: specific academic interventions and classroom skill interventions. In regard to these two types of interventions, Hattie asks several poignant questions:

> For differentiation to be effective, teachers need to know, for each student, where that student begins and where he or she is in his or her journey towards meeting the success criteria of the lesson. Is that student a novice, somewhat capable, or proficient? What are his or her strengths and gaps in knowledge and understanding? What learning strategies does he or she have and how can we help him or her to develop other learning strategies that he or she needs? . . . It should be obvious why rapid formative feedback can be so powerful for teachers… (*Visible Learning for Teachers* 110).

Clearly, Hattie gives us much to think on and many concepts to unpack. Of course, the first thing he mentions is success criteria. Using his definition, "a way of knowing that the desire learning has been achieved" (*Visible Learning for Teachers* 52), we understand that the goal of differentiating the instruction is to help the students demonstrate those success criteria. While not explicitly present in the paragraph quoted material above, near to the definition, Hattie tells us that the students need to know where they are going (*Visible Learning for Teachers* 52). In other words, the goals of the lesson as well as how to know that the goals have been met need to be clear to both teacher and student. Second, we learn that a teacher must know what phase of learning the student is in. Hattie uses the labels novice, capable, and proficient as defined by Bransford, Brown, & Cocking, 2000 (*Visible Learning for Teachers* 107). To have this knowledge, a teacher must have some knowledge of each student individually. While not a perfect gauge of student ability, Wisconsin Kindergarten through 8th grade students take the Forward Exam while 9th and 10th grade students take the ACT ASPIRE and 11th grade students take the ACT. While these tests reveal a snapshot of a day in the life of a student, they can provide a starting point for understanding in what phase of learning a student currently resides. Additionally, some schools employ a screener test. The author's school uses the STAR 360

Reading Assessment as a beginning of the semester screener as well as interim assessments each semester (four assessments each school year). While it does not assess every standard, the STAR 360 does list the Common Core State Standards the assessment includes and an individual student performance on those standards. Again, a snapshot of a day in the life of a student, however the STAR 360 Reading assessment does give a teacher a starting point and data during the school year on student progress for the limited number of standards the STAR 360 Reading assesses. This assessment cycle is akin to a form of Bambrick-Santoyo's Data Driven Instruction model (Atkins xvi). Essentially, Bambrick-Santoyo's model is a six to eight-week cycle of Assessment, Analysis, and Action designed to deliver targeted instruction to students to improve their skills in relation to state standards (Atkins xxvi). Brain-based learning and Data Driven Instruction do share some common strategies, such as the need for targeted teaching of skills in which the individual students are not proficient; however, our purpose is not to compare them. We will note the importance of targeted interventions to each and limit the discussion there. Moving to the area of skill interventions, Hattie notes,

> "[s]truggling students are in most need for strategy teaching, but even able students can have inefficient strategies or become overly dependent on a few strategies…We all need to develop sufficient strategies over which we have some control of when and how to use them (*Visible Learning for Teachers* 126).

The contrast that Hattie is making here is concerned more with the teacher mandating learning strategies rather than allowing the students to choose which strategies work best for him or her. As you noticed, Hattie speaks of able students with limited strategies as well. Teachers need to teach strategies that have appeal and use across the curriculum and then allow students to select

the strategy that works best for them in a particular situation. As many of these strategies were previously discussed in the section on building cognitive capacity, we will not repeat them here.

The sixth element for developing student effort is class climate and high expectations (Jensen and Snider 87). Let us define a positive classroom environment. Goodlad's definition (qutd. in Pierce 37) defines "classroom environment as the physical, emotional, and aesthetic characteristics of the classroom that tend to enhance attitudes toward learning." This definition presupposed the descriptor "good" or "positive." Within the online environment, this definition holds true. For instance, although the student schools with a computer, two physical environments exist. The first physical environment is the home environment. Obviously, the online teacher has little or no control over this physical environment. The second physical environment is the online classroom. One could argue that because the online platform is in the virtual world it does not qualify as physical. Contrarily, in a brick and mortar classroom, the teacher would hang posters, charts, and other items on the walls. We assert the same can be done in both a synchronous and asynchronous ways. Look at figures seven and eight for visual examples. This is a slide from the author's September 25, 2018 synchronous class. This was a unit test day, so positive messaging was displayed prior to class.

Figure seven: LAC 2 synchronous session slide displayed prior to class

Source: Dondlinger, Daniel J. "LAC 2 synchronous session slide displayed prior to class" *Literary Analysis*

and Composition 2, K12, Inc., 25 Sep. 2018.

Image Sources:

"Cute Puppy." *Meme Generator*, memegenerator.net/instance/48418336/cute-puppy-relax-you-got-this.

"Hey You Stop Stressing." *20 Best Memes To Let You Know That 'You Got This'*, SayingImages Inspiring Quotes & Pictures, 2017, sayingimages.com/you-got-this-meme/.

"Like a Boss You Got This- Anchorman Birthday." *Meme Generator*, ru.memegenerator.net/instance/81042883/anchorman-birthday-like-a-boss-you-got-this.

"Seriously." *20 Best Memes To Let You Know That 'You Got This'*, SayingImages Inspiring Quotes & Pictures, 2017, sayingimages.com/you-got-this-meme/.

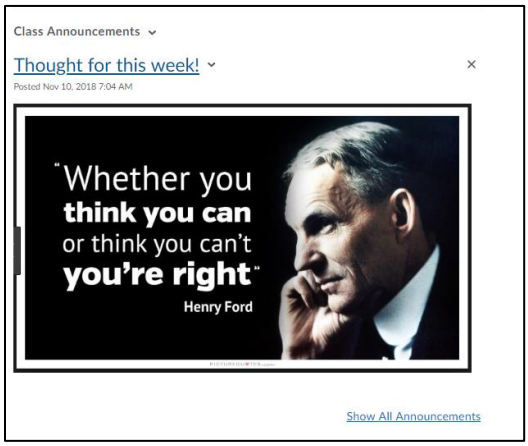
"You Got This and You Know It! Featuring a Baby." *Imgflip*, 2017, imgflip.com/i/1rcz0q.

"You Got This! Good Luck! Featuring a Minion." Topimages.com.

"You Got This Featuring Bill Murray." *22 You Got This Meme*, thuglifememe.com/22-got-meme/.

Figure eight shows a course announcement in the author's asynchronous classroom (only the announcement, not the entire class home page is displayed for enlargement purposes). More limitations exist in the asynchronous classroom in regard to what elements can be customized; however, the online teacher can post "posters" after the same manner as traditional classroom colleagues.

Figure seven: Course announcement



Source: Dondlinger, Daniel J. "Course announcement" *Literary Analysis and Composition 2*, K12, Inc., 25 Sep. 2018.
Image: Kevaton. "Picture of Henry Ford with Quote 'Whether You Think You Can or Think You Can't You're Right.'" *Get Inspired: 3 Most Important Quotes From Henry Ford*, STEEM, 2017, steemit.com/quote/@kevaton/get-inspired-3-most-important-quotes-from-henry-ford.

The teacher does have some control over the visual "physical" environment. Additionally, the teacher has control of the audio environment to some degree by ensuring his or her microphone is in working order. Perhaps the emotional environment is the most crucial. The online teacher has a rare opportunity. Most students have little or no experience in an online classroom, so the expectations a teacher establishes as well as the behavior modeled in front of the students will become the norm. Jensen states, "Your attitude each day is an important to learning as the material you present" (*Brain-Based Learning* 99). Teachers influence their students' attitudes and approaches to learning. As Jensen and Snider state, "Class climate is never an accident" (87). Probably the most overriding issue when it comes to a discussion of classroom climate is the sense of community, or lack thereof, that is experienced by so many students. We see the issue identified in this way in *Applied Pedagogies: Strategies for Online Writing Instruction*:

> Social presence is something we rarely consider in the face-to-face classroom. When students see one another within a physical space, we simply assume that presence will occur; students will develop a sense of who their colleagues are simply by being around them" (Pallof and Pratt, 2007, 30). However, students in online classes have often reported a sense of isolation, "a factor often ignored by many educators, but one that may make the difference between a successful and an unsuccessful online learning environment for many students" (McInnerney and Roberts 2004, 73) (Ruefman & Scheg, 62).

This social presence is affected by the classroom climate. The teacher plays the main role to establish this climate. As many synchronous platforms use a moderator system, a role the teacher fills, all student actions are filtered through the teacher's decisions. For instance, the teacher decides whether to allow a completely open chat, allowing students to chat publically and privately with each other, or a completely closed chat allowing students only to chat with the teacher. Each chat policy can contribute positively to the classroom climate. Regardless, the classroom climate should be one that encourages student learning goals and expectations. Hattie tells us that when students have expectations for themselves the effect is "off the charts" in regard to student learning (qutd. in Jensen and Snider 87). The important phrase is "for themselves." The students must be part of the setting of expectations and see the connect to themselves. Goals serve the purpose of defining the measure of success (Hattie *Visible Learning: A Synthesis* 164). Students need goals to know when they have accomplished a task. Hattie encourages teachers to set difficult goals over "do your best" or no assigned goals (*Visible Learning: A Synthesis* 164). This approach to goal setting makes sense. No assigned goal, by logical conclusion, is not a target. The student would be confused by this. Jensen and Snider make this comment about "do your best"—it is usually too low of a goal (89). As online English Language Arts Teachers with the student profile established earlier, we would see few students regain lost ground because their personal best is, in some cases, far below the benchmarks at their grade level. Asking them to do their personal best may not be expecting enough of them!

The final element of encouraging student effort is continuous, informal feedback (Jensen and Snider, 91). Without a doubt, feedback is important to English Language Arts teachers in general. As English Language Arts teachers, we seem to give feedback constantly. Hattie would call this practice a strong one for influencing student learning; feedback registers tenth on his list

of influential factors (*Visible Learning: A Synthesis* 173). If feedback is that crucial to student success, we must provide it. Ruefman and Scheg write, "Most instruction in the contemporary writing classroom occurs not through pedagogical materials, but from the feedback prompted by students writing" (14). Due to the lack of student-teacher physical proximity, Ruefman and Scheg's statement is probably most accurate in the online environment. While some writing instruction takes place in the online classroom to be sure, most of the writing instruction takes place when students receive feedback on their work. The author's experience is that most students do not attend live sessions regularly, either viewing the recording or choosing not participate at all in that particular lesson. For students who choose to not benefit from classroom feedback, written feedback from the teacher is all the writing instruction they receive. What does feedback look like? A number of sources agree to the two following characteristics of good feedback: first, it is timely (Jensen, *Brain-Based* Learning 237; Marzano, *What Works in Schools* 37; Tantillo 87) and, second, it is specific. (Jensen, *Brain-Based Learning* 237; Marzano, *What Works in Schools* 38; Jensen & Snider. 93). Both of these characteristics can be incorporated into the online classroom. First, in a synchronous session, the teacher can utilize break out rooms. Each student can have their own break out room in which he or she works on the board. The teacher can enter the room, quickly observe the student writing and provide feedback (adapted from Tantillo 88). In the asynchronous environment, software such as Microsoft Word and Adobe Reader allow readers to insert comments into the document. Additionally, Ruefman and Scheg reference screen capture technologies and audio feedback to help clarify written comments (14). Some online platforms allow for visual feedback to be recorded as well. Regardless of the technological delivery, timely and specific feedback is possible and crucial in the online environment.

To conclude the research portion, the English Language Arts teacher in the online environment has a great deal to gain from employing brain-based educational techniques. The first, and perhaps the most key idea is that all students can learn. We realize that all students' brains are unique. Each brings with him or her a distinct lifetime of experiences which have shaped their neural pathways. Knowledge of how the brain learns and creates meaning is a key application of brain-based learning in the English Language Arts online classroom. Further, knowing that these new neural pathways are literally changing our students' brains and, importantly, how we play a role in that change. We learned the five characteristics of experiences that drive positive change in the brain: persistent, contrasting, meaningful, positive, and consistent (Jensen and Snider 17). We also realize that the stage of development our students are in affects their decision-making processes which lead to some risky behaviors. Fortunately, we also see the "brain nudges" that help teachers influence our students decision-making processes. We also explored three of Jensen and Snider's "Big Four Factors" of brain-based learning in context of struggling teen aged students. We broke them apart, applied further research, and looked for online applicability. The fourth factor was held in reserve until now as it applies broader than just to Jensen and Snider. Their fourth factor, focused strategy, is simply reminding students of what works and how to do school (Jensen and Snider 11). As teachers, but particularly teachers of struggling English Language Arts students online, we have to be reminding our students constantly of strategies that work and other strategies that might work which they have not yet tried. One thing that was probably noticed early into this discussion is that overlap exists between the areas. Brain-based learning labels are convenient, but the same concepts reoccur at different points. The reason for this repetition is simple and found in the early pages of our discussion—the human brain in actuality is not a thing, dissected and labeled.

The human brain is a living and changing part of us. For instance, Dweck's growth mindset was a critical piece in several areas: the winner's mindset, Seligman's Learned Optimism, and Pink's Type I individuals. Although we may break this research into categories and labels to help us, the human brain uses and does all these things as a whole. As Jensen tells us, the human brain "is highly connected in that events in one part of the brain affect those in other parts of the brain" (*Brain-Based Learning* 9). The human brain is a true marvel, and online English Language Arts teachers need to leverage as much knowledge of it to help their struggling students reach their potential.

Moving to some specific brain-based activities and strategies, the subsequent format will be used. First, the activity or strategy is named and the source is listed. Next is a description of the activity or strategy followed by a sample of implementation in the online environment, synchronous or asynchronous as appropriate. Finally, a brief discussion of the brain-based elements will conclude the discussion of the activity or strategy.

Activity: Vocabulary Bumps

Source: Kruse, Melissa. "5 Brain-Based Vocabulary Activities for the Secondary Classroom." *The Reading and Writing Haven*, 11 Dec. 2017, www.readingandwritinghaven.com/5-brain-based-vocabulary-activities-for-the-secondary-classroom/.

Description:

Students are presented with a whiteboard slide with three or four boxes that contain three to four words. There is a directional arrow to help the students know which direction the words should flow. The first box, located at the center top, has four words in it. The student decides which word does not belong with the other words. That missing word is them moved to the next box. The student then examines the fours words (three existing and the one the student moved to the box) and decides which word does not belong. The student moves this word to the next box. This process continues until all the words are "bumped" to the correct box.

This activity can be completed by individual students or in small groups. Create break out rooms, either one for each individual or one for each group. Copy the slides to each breakout room. Either the timer can end the activity or students can display a green check on their polling tools to indicate they are finished.

Initially, this activity is teacher prepared but students could prepare their own vocabulary bump boards. Due to limited space on the whiteboard and too small of print is hard to read, use only four or five bumps on a single whiteboard slide.

Figures eight and nine demonstrate a potential online classroom presentation used in the author's synchronous session. Figure eight displays the student instructions. Figure nine is a

sample Vocabulary Bump. The lesson featured three different pages arranged in the same fashion as figure nine. This activity is adapted from Kruse's Bumper Words.

Examples:

Figure eight: Vocabulary Bump Student Instructions.

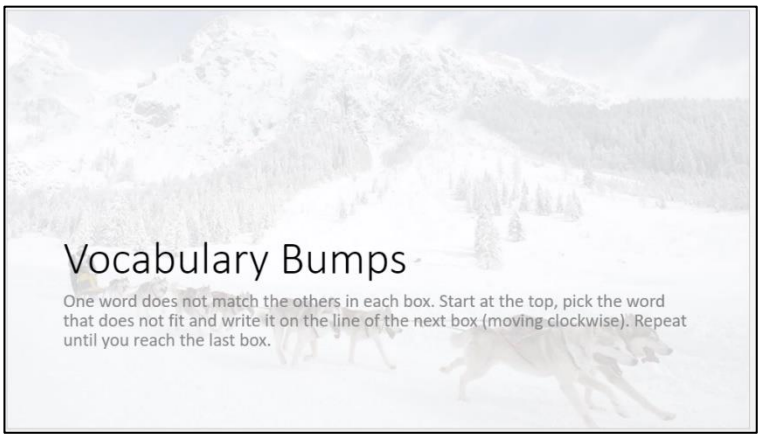
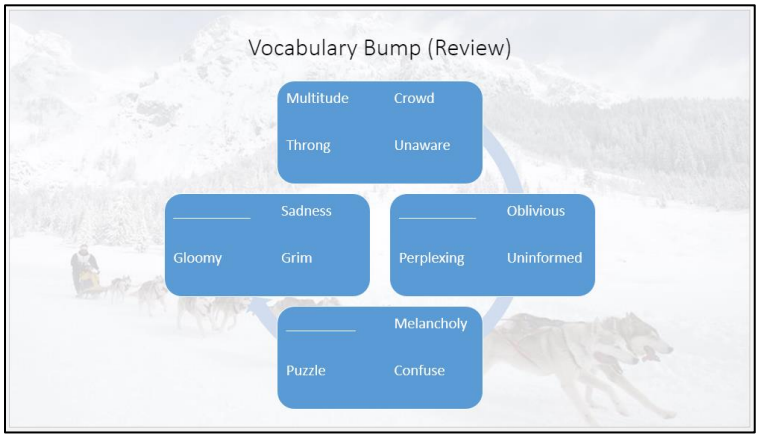


Figure nine: Sample Vocabulary Bump Synchronous Classroom Slide



Source:

Dondlinger, Daniel J. "Vocabulary Bump Student Instructions." *Literary Analysis and Composition 2*, K12, Inc., 18 Sep. 2018.

Dondlinger, Daniel J. "Sample Vocabulary Bump Synchronous Classroom Slide." *Literary Analysis and Composition 2*, K12, Inc., 18 Sep. 2018.

Discussion:

Notice a number of ties to Brain-based learning. This activity is designed for review. Jensen and Snider suggest, "Practice existing classroom content in your current unit" (69) over

incremental periods within the class period over the weeks to build cognitive capacity. This activity allows for the students to review their learning in a unique way. Kruse points out two other connections to research: first, this activity can be differentiated, and second, it causes students to think about how the words are related to each other. Thinking about the words in relation to each other is important. Jensen and Snider encourage "what's different" activities to build attention and focus as part of building cognitive capacity (66). This activity creates several "what's different" activities in succession. As has been discussed earlier, vocabulary building is part of helping students expand their prior knowledge (Marzano, *Building Background Knowledge* 35). This activity helps cement that vocabulary building on specific words while relating those words to words that they may already be familiar with, allowing the students to "hook" words being studied with familiar words.

Activity: Vocabulary Map

Source: *The Write Path English Language Arts: Exploring Texts with Strategic Reading Teacher Guide*. AVID Press, 2012, p.32.

Description:

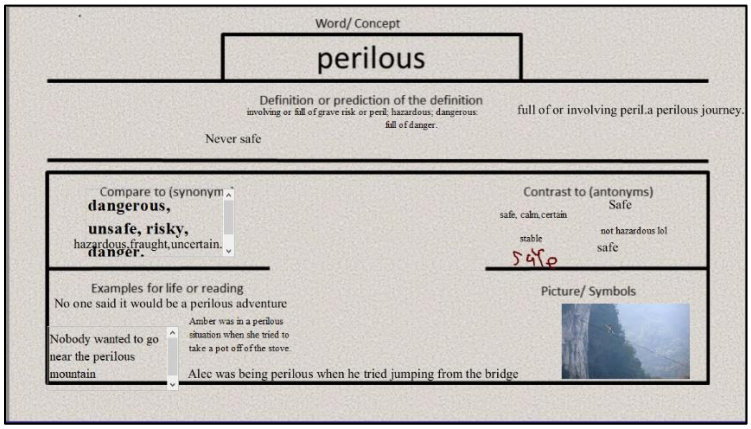
The student or students are given a whiteboard vocabulary mapping graphic organizer. The student or students then enter the following information into the appropriate parts of the mapping graphic organizer: definition, synonyms, antonyms, an example from life or reading, and an illustration.

This activity is also good for concepts. For example, instead of a vocabulary word, a concept like *romanticism* could be used. Mapping can be used by individual students, small groups working on the same word or concept, or small groups intending to jigsaw their maps together.

Due to the online environment, this activity does not take much time from the class period as the students can easily access all this information online. Figure ten is an example of a vocabulary map completed by a student group in the author's class. They completed the activity in approximately five to seven minutes.

Example:

Figure ten: Vocabulary Map Completed by a student group



Source: Dondlinger, Daniel J. "Vocabulary Map Completed by a student group." *Literary Analysis and Composition 2*, K12, Inc., 13 Sep. 2018.

Discussion:

As with the above vocabulary concept, this activity requires the student to relate the word or concept to other words. In contrast to that activity, the student provides the synonyms and antonyms. The two items asked of students on the bottom can be particularly powerful. Recall Marzano's quote of Stahl's work:

> Stahl breaks nouns into two basic categories: concrete…and abstract…He notes that concrete nouns can usually be described. Thus a teacher might initially give the . . . description for the concrete noun . . . Abstract nouns must be exemplified. Thus a teacher might provide students with . . . [an] example (*Building Background Knowledge 80*). [specific examples omitted]

The word map substitutes the student for the teacher in this example. They take the definition, synonyms, and antonyms and create both an example and concrete, visual representation. Note the student example displayed. This student group visually represented *perilous* as a tightrope walker crossing a canyon on a tightrope. The students are using the associations to make meaning.

Activity: Mind Mapping (also called Concept Mapping; Clustering)

Sources:

Hattie, John. *Visible Learning: A Synthesis of over 800 Meta-Analyses Relating to Achievement*. Routledge, 2009.

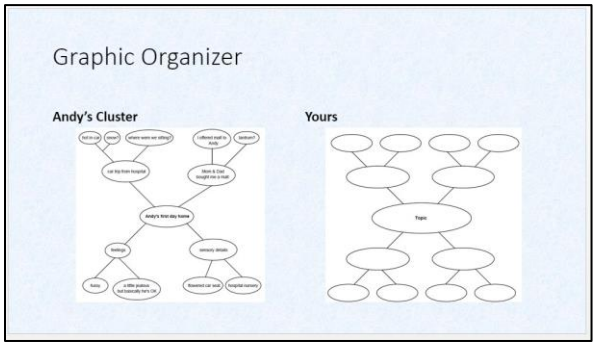
Jensen, Eric. *Brain-Based Learning: The New Paradigm of Teaching*. 2nd ed., Corwin Press, 2008.

Description:

The student either starts with a blank sheet paper/ whiteboard or uses a graphic organizer as provided by the teacher. In the center the student writes a word or phrase. This word or phrase can be a term, concept, or, in the case of prewriting, the topic of the writing activity. The student then adds related words and phrases into clusters around the central term. This activity can be used for prewriting (as mentioned), accessing prior knowledge, assessing current learning, taking notes, and for whatever a creative teacher chooses to use it.

Example:

Figure ten: Mind mapping graphic organizer with sample for prewriting



Source: Dondlinger, Daniel J. "Mind mapping graphic organizer with sample for prewriting." *Literary Analysis and Composition 2*, K12, Inc., 27 Sep. 2018.

Discussion:

A multitude of other sources could have been listed for this activity. The author has heard and read about mind mapping, or concept mapping, in college classes, workshops, and books and articles for about as long as he has been in education. The reason for this is simple: mind mapping works! Hattie gives this reason that concept mapping works: "Concept mapping can assist in synthesizing and identifying the major ideas, themes, and interrelationships—particularly for learners who do not have these organizing and synthesizing skills" (*Visible Learning: A Synthesis* 168). Concept mapping allows students to develop these skills by allowing them to create their own graphic organizer. If he or she feels that another item belongs in a particular cluster, he or she can simply add it. Jensen reminds us to break our instruction, specifically with high school students every 10-15 minutes to work with natural brain cycles; he suggests mind-mapping as a break-in-instruction activity (*Brain-Based Learning* 28). In the online classroom, providing breaks is difficult as students who wander from their computers may not wander back, so to employ an alternate learning activity as a break in instruction is a practical way of utilizing the brain research on cycles and attention but still keep the students in the classroom.

Activity: K-W-L chart

Sources:

Ogle, Donna M. "K-W-L: A Teaching Model That Develops Active Reading of Expository Text." The Reading Teacher, vol. 39, no. 6, 1986, pp. 564–570.

Carr, Eileen, and Ogle, Donna. "K-W-L Plus: A Strategy for Comprehension and Summarization." Journal of Reading, vol. 30, no. 7, 1987, pp. 626–31.

Description:

The K-W-L Activity follows three basic steps. Usually the students either are supplied with a graphic organizer (see figure eleven: K-W-L strategy sheet) or create a chart in their notebooks. Ogle outlines the steps as follows:

- Step K: What I Know: two levels of accessing prior knowledge
    - Brainstorming what the student or students know about the topic of the reading
    - Thinking of the general categories of information likely to be encountered (i.e., descriptions, special characteristics, and so forth)
- Step W: What do I want to learn? Questions emerge after Step K; all this prereading activity develops the student's own reason for reading.
- Step L: student write what they learned; assess whether their questions have been answered (Ogle 565-567)

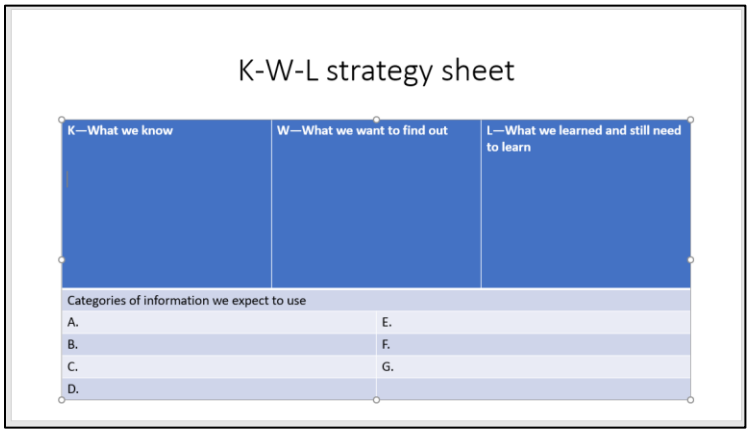
From Ogle's description, we can see the process: prepare students to read by helping them access prior knowledge on the subject of the reading, engaging them with a reading purpose of their

own choosing, and enabling them to assess their own learning and accomplishing their own reading purpose.

Teachers, at their discretion, can omit the second part of Step K, listing general categories of information.

Example:

Figure eleven: K-W-L strategy sheet



Source: Ogle, Donna M. "K-W-L: A Teaching Model That Develops Active Reading of Expository Text." The Reading Teacher, vol. 39, no. 6, 1986, pp. 565.

Discussion:

Coined by Ogle, a K-W-L chart is the written portion of a three-step procedure for the three steps: "accessing what I Know, determining what I Want to learn, and recalling what I did Learn as a result of reading (Ogle 565). This rereading process has been cited in various books and articles. It is a strong brain-based learning activity for several reasons. First, it accesses prior knowledge. As we have discussed prior knowledge several times, we will not repeat that discussion; however, the first part of the procedure is to recall prior knowledge. Second, K-W-L

encourages the student to actively ask questions about their prior knowledge and ask what more they wish to know about the subject. Hattie suggests that self-questioning and self-verbalization are an effective way for students to search for needed information with some indication in the meta-analysis showing this strategy may be even more effective for lower ability students—our target student group (Hattie *Visible Learning: A Synthesis* 193). By encouraging students to set their own learning goals, we also increase interest and student effort. To recall Pink whom, we cited in the section on student effort, "Autonomy . . . is different form independence. It's not the rugged, go-it-alone, rely-on-nobody individualism of the American cowboy. It means acting with choice—which means we can be both autonomous and happily interdependent with others" (88). This activity provides an opportunity for students to exercise a degree of autonomy by self-directing some of his or her learning. The final part of the procedure, students recalling what they did learn, is akin to summarizing their learning. All three parts of the procedure together can be fit under the Hattie's broad category of reciprocal teaching, part of which is "teachers enabling their students to learn and use cognitive strategies such as summarizing, questioning, clarifying, and predicting and these are 'supported through dialogue between teacher and students as they attempt to gain meaning from text' (Rosenshine & Meister, 1994, p. 479)" (*Visible Learning: a Synthesis* 204). In the case of K-W-L activities, questioning and clarifying are the primary skills utilized but elements of summarizing and predicting are present. Essentially, it would appear that K-W-L activities are the exemplar brain-based learning techniques.

The K-W-L activity does have its detractors. Lemov does point out a weakness in the "K" portion of the K-W-L procedure:

> The "Things I know" column, I came to realize, asked students to make unsubstantiated guesses about the things they knew least about or led to our developing a wide-ranging

> list of 'facts' of varying degrees or importance and accuracy. The "Want to Know" column was similarly grounded in lack of knowledge—often idiosyncratic or distracting from the things that were most important for students to master and many of which would never be addressed, causing me to play a shell game of pretending to be open to talking about whatever my students wanted when this was illogical and impossible (285).

Whereas Lemov does make a good point, many of our struggling kids do not have the extensive background knowledge on certain topics or perhaps have an erroneous understanding of the facts, the K-W-L procedure still has value for the previously mentioned points: helping them to understand what they already know about the topic and allowing them some autonomous, self-directed learning. To expand, recall what has been previously stated in the matter of prior knowledge: It is critical that we access student's prior knowledge or help them to develop prior knowledge. Why does a K-W-L activity need to necessarily occur at the absolute beginning of a lesson? Lemov stated that he found "ten minutes of teacher-driven background and then getting right to the reading is usually worth an hour of, 'Who can tell what Nazis were?'" (285). The question for Lemov is why not ten minutes of teacher-provided background and then ask "What do you know?" Not only would this approach reduce the inaccurate responses of students, it would allow repetition of the content material. Consider Jensen's statement, "After each focused learning period, conduct an elaboration activity, such as mind mapping, pair shares, or model building" (*Brain-Based Learning* 29). The connection between Ogle, Lemov, and Jensen, is seen when all three ideas are synthesized. To prevent inaccurate prior knowledge, the English Language Arts teacher can build some background knowledge intentionally and then ask the students to complete the first part of the K-W-L exercise. The firmer foundational facts of the first part will then translate into better "Want to know" questions. Ultimately, Lemov's

observation of a weakness in the K-W-L activity can be turned into a strength with guided prior knowledge building and intentional placement of the K-W-L activity within the lesson.

Variation Activity: K-W-L Plus

Source:

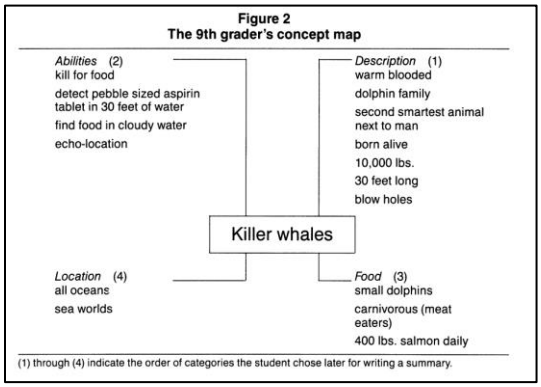
Carr, Eileen, and Ogle, Donna. "K-W-L Plus: A Strategy for Comprehension and Summarization." Journal of Reading, vol. 30, no. 7, 1987, pp. 626–31.

Description:

The initial procedure is identical to the K-W-L activity above. Carr and Ogle add concept mapping and summarizing to assist students in thinking critically about the information the have read (628). These additional pieces occur after students complete the traditional K-W-L chart. An example of the concept map is in figure twelve. The format demonstrated by Carr and Ogle is one representation. Recalling the previous discussion on mind mapping, students determine the actual shape of the mind map. The summary is a straight forward writing activity whose exact parameters are determined by the teacher.

Example:

Figure twelve: Figure 2 The 9th grader's concept map



Source: Carr, Eileen, and Donna Ogle. "Figure 2 The 9th Grader's Concept Map." *JSTOR*, 1987, www-jstor-org.ezproxy.uwsp.edu/stable/pdf/40031872.pdf?refreqid=excelsior%3Aee43a703f8fd526f9b9d136adf7d9d8f.

Discussion:

Although teachers do not always ask his or her students to complete the general information categorizing portion of Step K, if a teacher were to ask that of the students, it may help the students complete the mind map easier. As we have already discussed the brain-based link of mind mapping as separate activity (Hattie, *Visible Learning: A Synthesis* 168; Jensen, *Brain-Based Learning* 28), we will not repeat those points now. As part of the original K-W-L discussion, we have seen the benefits of summarizing amongst other reciprocal teaching activities (Hattie, *Visible Learning: A* Survey 204). K-W-L Plus takes a good brain-based learning technique and makes it better.

Variation Activity: K-W-L-A Charts

Source:

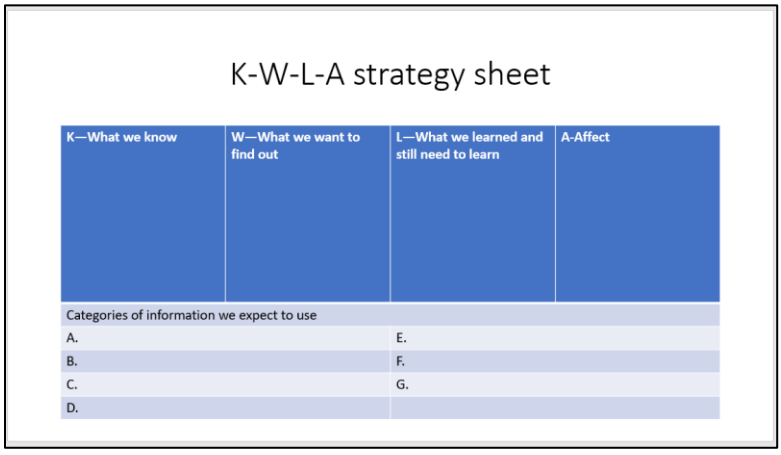
Mandeville, Thomas F. “KWLA: Linking the Affective and Cognitive Domains.” Reading Teacher, vol. 47, no. 8, 1994, pp. 679–80.

Description:

This is a second variation on the K-W-L activity. This variation can work with the K-W-L Plus as well. The student completes the either variant of the K-W-L activity with a fourth column added: Affect (Mandeville 679). This allows students to respond from their affective domain. Figure thirteen displays what the K-W-L-A Chart can look like.

Example:

Figure thirteen: K-W-L-A strategy sheet



Source: Ogle, Donna M. “K-W-L: A Teaching Model That Develops Active Reading of Expository Text.” The Reading Teacher, vol. 39, no. 6, 1986, pp. 565.
With modifications suggested by:
Mandeville, Thomas F. “KWLA: Linking the Affective and Cognitive Domains.” Reading Teacher, vol. 47, no. 8, 1994, pp. 679–80.

Discussion:

The brain-based implications of this K-W-L variation are interesting. We will not repeat the benefits of the K-W-L or K-W-L Plus structure, but rather focus on the affect component. Mandeville asserts that at least potentially three, affect, student responses: first, a personal connection, “I like the part about . . .”; second, a reflection on the importance or value of the

information, “Why is this information important?”; and third, a new attitude about their learning, “Next time I see/hear/ experience ___ I will . . .” (679). Mandeville’s observations are important to brain-based learning for two reasons: strength of learning and student effort. An area of brain research we have not emphasized is the role of the emotions in learning. As previously cited, the amygdala is associated with emotions and is believed to be responsible for connecting emotion and memory (Jensen, *Brain-Based Learning* 86). The connection between emotions and thinking should not be disregarded. As previously noted, strong emotional responses can take over the cognitive, causing the brain to focus on the emergency stimuli rather than the task at hand. To engage the emotions strengthens the learning. Jensen writes, “our brains are highly sensitive to each of our emotional states, and they run our thinking ability in several important ways” (*Brain-Based Learning* 84). In the classroom, a teacher that can help students connect reading with their emotions, particularly positive ones, should see learning abilities increase. The second connection is to student effort. Recall Pink used the phrase “encouraging them to seek to get ‘better at something that matters’” (Pink 109) in his description of mastery. People generally have strong emotional responses to items that they think matter. If the student can experience a strong emotional tie to the content or understand how it “matters” to him or her, the likelihood of learning also increases. Adding the “Affect” column to the K-W-L or K-W-L Plus procedure could lead students to this result.

Activity: Socratic Seminar

Source:

The Write Path English Language Arts: Exploring Texts with Strategic Reading Teacher Guide. AVID Press, 2012.

Description:

This post-reading activity features a classroom discussion based on student questions and presentation of ideas. The important word is *discussion.* "The focus of a Socratic seminar is to have the students discuss, not debate, the topics related to the readings and resources" (Keegan 50). This concept cannot be emphasized enough. A Socratic seminar is not a debate, although conflicting beliefs and statements may be presented, in fact, *The Write Path English Language Arts* devotes an entire page comparing and contrasting dialogue versus debate (327). The idea is to help students develop a deeper understanding of the text and concepts rather than winning an argument.

Procedurally, a Socratic seminar can be as simple or complex as the teacher wishes it to be. Keegan offers these Simpler Steps to a Socratic Seminar:

- Determine the topic students need to study.
- Select several articles that give different perspectives on the same topic.
- Read articles with the class or have them read them on their own.
- Have students reflect on the articles individually.
- Create five to seven open-ended questions based on the articles.
- Break students into small groups and have them discuss the open-ended questions one by one. (Keegan 51)

This a straight forward process for developing a Socratic seminar in a traditional classroom. The online English Language Arts teacher needs to modify the final step in the process. Two pieces of the online environment work against the last step when the author used the Socratic seminar. First, the students were in various stages of preparation for the seminar. The due date policy incorporates a "final due date" after which an assignment cannot be submitted as part of the grade. Not all students will have completed the work necessary to participate actively in the seminar. Further, not all students are comfortable speaking on the microphone. Dialogue in real time through chat is difficult due to typing speed and accuracy. The second factor is class size. The author routinely has 70 to 80 students attend any given class session. The logistics of dividing students into perhaps 15 separate break-out rooms is difficult; additionally, there is no way to visit each room to know what is happening inside. Furthermore, the teacher cannot accurately predict when students will be absent and are watching the recording. The recorder does not work in break out rooms in the platform the author's school uses; however, the recording issue can be resolved by meeting one group in the main room for the purpose of being recorded. The online teacher needs to make some adjustments to Keegan's last point.

The first of several adjustments is the organization of the seminar. The authors of *The Write Path English Language Arts* offer several variations: a single large seminar, inner/outer circle, triad seminars, and multiple, simultaneous seminars (322). The author elected a triad seminar organization. This organization utilizes "pilots" and two "co-pilots." See figure fourteen to see how this looked in the author's synchronous session. The pilots were the individuals who spoke during the seminar on the microphone. Earlier Murphy, et al. was referenced because a teacher in their study commented "…the kids prefer to chat and not talk on Skype" (588). This is a very important point in for the online English Language Arts teacher to consider. The author

chose the triad seminar organization specifically due to this classroom microphone dynamic. Students who rely on chat have good ideas to share but they are not always the best typists, either in speed or accuracy. The entire dialogue will slow or stop waiting for a student to use the chat to express a complex idea. It is the author's experience for best results, recruit students who are willing to speak on the microphone as pilots. The co-pilots serve as advisors to the pilots. They use private chat to communicate with each other and the pilot to help the pilot refer to the reading, respond to questions, and ask questions. None of the co-pilots need to use the microphone. The second consideration is how many seminars to conduct. The author conducted one large seminar with the students who were not pilots or co-pilots completing an observation form. In the future, the author has considered two options to increase student participation. One option is to recruit another teacher to help facilitate a seminar in a break out room. Another option is to stagger the seminars within the class session; after a set amount of time, the seminar is over, and the next group conducts a seminar on the same topic while the students in the first seminar complete the reflection activity.

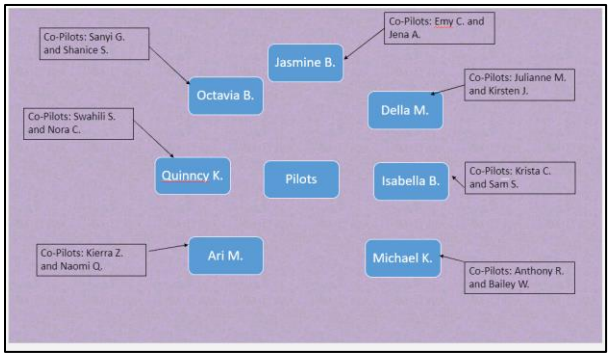
When the online teacher conducts the actual Socratic Seminar, three procedural items seem to make the experience go more smoothly. First, the first time the author conducted a Socratic seminar, he wrote the initial questions. In the future, as his students' questioning skills improve, the initial questions will be student generated. Second, the first time the author moderated the Socratic seminar, he did not differentiate on the whiteboard who was talking or who would talk next. In a traditional classroom, visual cues exist, such as raising a hand; however, there are no such cues in the online environment. Using a moveable object on the whiteboard would allow all participants to know who is ready to speak and to allow them to do so. Third, in the authors online platform, participants can raise their hands. When their hand is

raised, the platform assigns them a number in the order in which they raised their hands and moves them to the top of the participant list. The author had the pilots raise their hands and keep them raised for two reasons. First, the observers in the room and those watching the recording had all the pilots at the top of their lists, making them easier to find. Second, in the online platform, the individual speaking has a blue microphone next to their name or participant number in the recording. This clear demarcation allows the observers to know who is speaking at any given time.

After the seminar, three important processes take place. These processes may be more important than the Socratic seminar itself. They are summarizing the content of the seminar, reflecting on the process of the seminar, and setting goals for improvement for the next seminar (*The Write Path English Language Arts* 326). Figure fifteen shows an example of the Socratic seminar debrief and reflective writing (Hero 11-12). The students would complete this worksheet as well as summarize the content of the seminar.

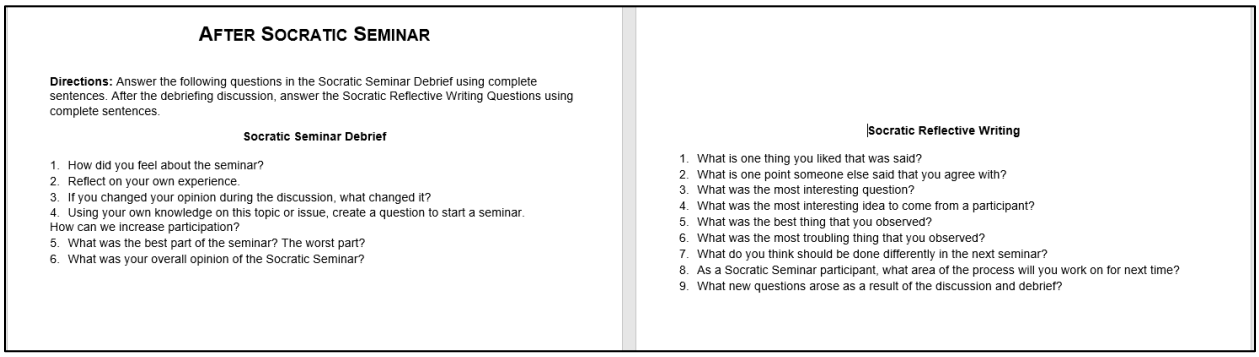
Example:

Figure fourteen: Socratic seminar pilot and co-pilot slide



Source: Dondlinger, Daniel J. "Socratic seminar pilot and co-pilot slide." *Literary Analysis and Composition 2*, K12, Inc., 20 Sep. 2018.

Figure fifteen: Example of the Socratic seminar debrief and reflective writing



AFTER SOCRATIC SEMINAR

Directions: Answer the following questions in the Socratic Seminar Debrief using complete sentences. After the debriefing discussion, answer the Socratic Reflective Writing Questions using complete sentences.

Socratic Seminar Debrief

1. How did you feel about the seminar?
2. Reflect on your own experience.
3. If you changed your opinion during the discussion, what changed it?
4. Using your own knowledge on this topic or issue, create a question to start a seminar. How can we increase participation?
5. What was the best part of the seminar? The worst part?
6. What was your overall opinion of the Socratic Seminar?

Socratic Reflective Writing

1. What is one thing you liked that was said?
2. What is one point someone else said that you agree with?
3. What was the most interesting question?
4. What was the most interesting idea to come from a participant?
5. What was the best thing that you observed?
6. What was the most troubling thing that you observed?
7. What do you think should be done differently in the next seminar?
8. As a Socratic Seminar participant, what area of the process will you work on for next time?
9. What new questions arose as a result of the discussion and debrief?

Source: Hero, Melissa. "AVID Socratic Seminar ." Pasco County Schools, 2004, pp. 11-12.

Discussion:

First, English Language Arts teachers should try a Socratic seminar. The description seems long and complicated, but it really is not. The students enjoy the process, and the teacher uses several solid brain-based learning strategies.

Speaking of brain-based learning, the Socratic seminar has many. First, in determining the topic which the students will discuss and articles which they will read, the underlying assumption is that the teacher will need to utilize pre-reading strategies that both access prior knowledge and develop vocabulary skills. As we have established the brain-based learning ties to both of activities several times previously, repetition is not necessary; however, both of these general strategies translate to brain-based learning. Preparing for the seminar deals with formulating questions. Hattie expands the thought of student questions with this statement, "structuring class sessions to entice, teach, and listen to students questioning of students is powerful" (*Visible Learning: A Synthesis* 183). Students asking questions of each other and answering each other is a strong brain-based strategy and is the basis of the Socratic seminar.

Jensen and Snider mentions questioning strategies as a component of increasing classroom engagement (79). Classroom engagement can lead to higher student achievement. Finally, the post-Socratic seminar procedures include several strong brain-based strategies. First, we have already established student-written summaries as a high achievement practice (Hattie, *Visible Learning: A Synthesis* 204). Second, as students reflect on the process of the seminar, they are examining the process they used to participate in the seminar. Jensen and Snider tell us that when students are processing, they are doing mental work (61); further, they identify writing down what you experienced is a process skill (62). The act of recounting and thinking about their participation in the seminar is helping build their processing skills. Finally, students are to set goals for next time. Jensen and Snider, in reference to specific processing program commercially available, state "kids will still need to clearly buy into the program, setting compelling, self-directed goals for maximum progress" (61). Not wishing to stray too far from the context, this statement seems to be applicable to the Socratic seminar in that the student needs to buy in, yes, but to see progress, needs to set compelling, self-directed goals. One can almost hear a student say, "Next time we do this, I am going to . . ." Hattie gives us a compelling concept from Locke and Latham, "A major finding of their [Locke and Latham] book is that achievement is enhanced to the degree students and teachers set challenging rather than 'do your best" goals, relative to the students' present competencies" (Hattie *Visible Learning: A Synthesis* 164). The goals setting portion of the Socratic seminar reflection allows students to set challenging goals relative to their current performance, or present competency. All aspects of the Socratic seminar have ties to solid brain-based learning strategies.

Strategy: Focused Note Taking

Source:

"Selecting the Appropriate Format for Note-Taking." AVID, 2018.

"The Five Phases of the Focused Note-Taking Process." AVID, 2018.

The Write Path English Language Arts: Exploring Texts with Strategic Reading Teacher Guide. AVID Press, 2012.

Description:

Focused Note-Taking involves the student doing more than simply writing down everything a teacher says or includes in a PowerPoint slide. The purpose of focused note-taking can be stated this way, "students thoughtfully consider their purpose for note-taking and make deliberate decisions at every phase of the process based on that purpose" ("Chapter 3: Focused Note-Taking"). Focused note-taking can also be applied to readings, discussions, videos, and so forth. Focused note-taking is active learning. The student does much more than take notes. According to AVID, there are five phases of focused note-taking process:

1. Taking notes
2. Processing notes
3. Connecting thinking
4. Summarizing and reflecting on learning
5. Applying learning ("The Five Phases of the Focused Note-Taking Process")

Students are encouraged to think about the content much more deeply than simply taking notes.

While the author uses Cornell Notes with his students, there are other formats that can be considered focused note-taking formats. AVID lists seven different formats in its chart, "Selecting the Appropriate Format for Note-Taking," see table two for the entire chart including brief descriptions of each format and suggested uses and caveats.

Table two: Selecting the Appropriate Format for Note-taking

Type of Notes	Description	Uses and Caveats
Cornell Notes	Includes a space at the top to write the Essential Question, a large column on the right for the notes themselves, a slimmer column to the left of the notes space for questions, and a place for a summary at the end.	The format facilitates the phases of the focused note-taking process by designating space for note-taking, connecting, and summarizing. The notes column may be lined or unlined and can be used with many notetaking styles.
Two- and Three-Column Notes	A structured form of notetaking in which content is organized into two or three columns based on notetaking objectives and the purpose of the lesson.	This style of notes is useful when information is highly structured or the note-taker's response to the information follows a repetitive pattern. It can also be useful if the instructor wants to build in space for student input or processing in multiple modes. The headings or purposes for the columns can be adapted to many situations and note-taking styles, both linguistic and visual, and are usually determined by the instructor.
Sketchnotes/ Mind Maps/ One-Pagers	Graphic forms of notes in which information is represented with a combination of pictures, shapes, symbols, and text.	The visual nature of these styles of notes engages learners who thrive on creativity, allows note-takers to make connections among ideas, and appeals to students who like to doodle and draw.
Graphic Organizers	Diagrams, webs, flowcharts, concept maps, and other visual organizers that use shapes, arrows, and lines to show connections between ideas. The instructor or note-taker will predetermine the best organizational format to use to meet the note-taking objective.	Graphic organizers help learners see patterns, connect ideas, and produce nonlinguistic representations of learning in their minds (Marzano et al., 2008). Graphic organizers may be used as the sole note-taking structure for an entire lesson or interspersed into traditional notes as needed to clarify a relationship.

Charts and Tables	A multi-column grid formation with headings at the top. Students fill out the chart or table during the lecture, video, or reading, extracting only the specified information.	When a lecture or text follows a repetitive structure or when students are expected only to extract certain elements from a source for research or other purposes, charts and tables effectively focus students' note-taking. These can be frustrating for students if the content deviates from the pattern.
Interactive Notebooks	A living archive of student learning, set up on facing pages in a notebook. Typically, right-side pages are used for teacher input (notes, texts, handouts, etc.) while the left-side pages are designated for student processing and reflection on the content on the facing page.	Notes are one component that appears frequently in Interactive Notebooks. The format itself encourages reflection and student input on the notes. Interactive Notebooks are usually teacher assigned for a particular course, so this format would be less useful for research.
Combination Notes (Marzano et al., 2008)	A flexible style of notetaking that includes an informal outline (a linear style in which indentation indicates the relative importance of ideas) and web formats for note-taking. Note-takers divide the page into two columns. The left is for traditional, linear notes; the right is for notes taken using webbing or some other visual means. The note-taker leaves room at the bottom of the notes for a summary.	Not unlike Cornell notes, this style requires students to revisit and reconsider the information in multiple forms and to think about the content of the notes several times. This style of note-taking takes more time than other approaches because students interact with the information more than once, but the repetition incorporates much of the thinking expected in the focused note-taking process.

Source: "Selecting the Appropriate Format for Note-Taking." AVID, 2018.

From this chart, we see that there are several formats that can be used. Each format is considered focused note-taking because the phases of focused note-taking can be applied.

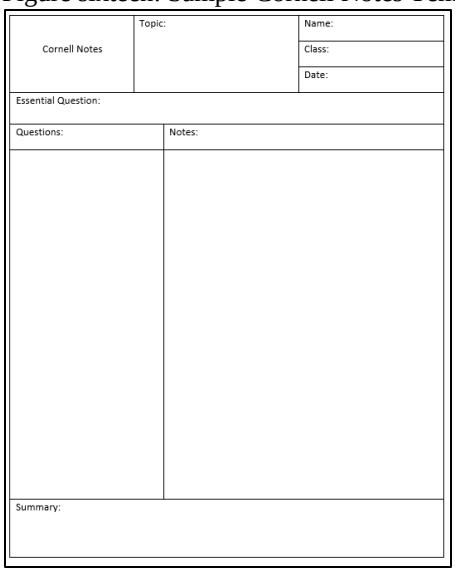
As previously mentioned, the author uses Cornell Notes with his students. The Cornell Notes procedure is straight forward and is the basic procedure as outlined by AVID in *The Write Path English Language Arts*. First, students either create the Cornell format in their notebook or use the provided template and complete the heading. During the class session or during reading, student take notes on the right side of the page (see figure sixteen for an example of the format).

Third, students review their notes to determine if they are missing information or if revision is necessary. Fourth, students create questions for each portion of their notes. Fifth, students write a summary of their learning. Students are encouraged to review their notes within a day, again within the next week, and finally within the next 30 days (*The Write Path* 127).

The author supports the students in focused note-taking during synchronous sessions. Figure seventeen is a sample whiteboard slide, helping the students complete the heading of their Cornell Notes. Figure eighteen is a slide inserted to help students begin the processing portion of the Cornell Notes. It is used as a transition slide from one lesson topic or part to the next.

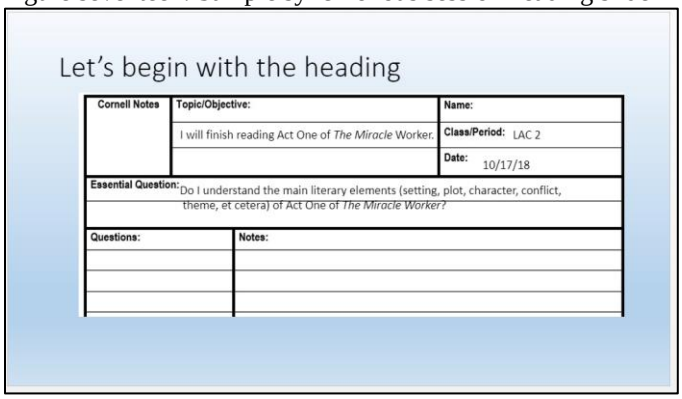
Examples:

Figure sixteen: Sample Cornell Notes Template



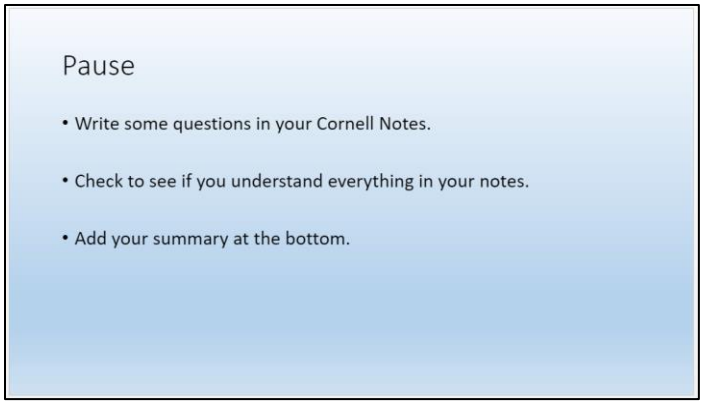
Source: adapted from: *The Write Path English Language Arts: Exploring Texts with Strategic Reading Teacher Guide*. AVID Press, 2012.

Figure seventeen: Sample synchronous session heading slide



Source: Dondlinger, Daniel J. "Sample synchronous session heading slide." *Literary Analysis and Composition 2*, K12, Inc., 17 Oct. 2018.

Figure eighteen: Sample synchronous session processing slide



Source: Dondlinger, Daniel J. "Sample synchronous session processing slide." *Literary Analysis and Composition 2*, K12, Inc., 17 Oct. 2018.

Discussion:

Note-taking is seemingly as established as school itself. Students are expected to take them and know what to do with them. With struggling students, English Language Arts or otherwise, this assumption is not warranted. Students need to be taught this skill and the processes that accompany note-taking. To see the brain-based connections, let us examine the activities that focused note-taking incorporates.

First, taking notes requires a number of skills such as paraphrasing content and organizing content information. Hattie states that activities like summarizing and paraphrasing promote am active approach to learning tasks, and organizing and transforming is a valuable part

of many interventions (*Visible Learning: A Synthesis* 191). Paraphrasing and summarizing appear in several phases of Focused Note-taking. Second, students use processing skills. We have seen Jensen and Snider's definition of processing before: "the act of working with, modifying, or altering something" (61). Students are definitely working with and modifying their notes as they underline, highlight, circle and so forth. Students working with the content to make sense of it. Third, students are also asked to ask questions of the content, both to help recall and to dig deeper into the content. We discussed questioning with the Socratic seminar, with Jensen and Snider indicating that student questions increase student engagement (79). While Jensen and Snider are speaking to the classroom at large, focused note-taking would increase student engagement with whatever the subject of the note-taking is. Hattie leads us to another valuable benefit of student-generated questions, "Huang also noted that the use of self-questioning provided assistance in searching for the information needed, and thus increased student understanding of the messages of the material to be learned" (*Visible Learning: A Synthesis* 193). Students will learn the content better by realizing where the gaps are in their learning. Finally, students need to revisit their notes for those notes to be effective. Kobayashi (2005) found several interesting findings about note-taking: the effects were higher when students had instructor notes as exemplars, reviewing notes was more effective than taking notes, and no effect was noticed for length of review, presentation or format of the presentation (video, audio, or live) (qutd. in Hattie, *Visible Learning: A Synthesis* 191). These three findings can assist the teacher in helping students take effective notes. The last finding is particularly interesting to online teachers because online students find themselves receiving content in all three formats. As the last phase of Focused Note-Taking is using the notes as a resource in learning, Kobayashi's

second point that reviewing notes has more effect than simply taking them reinforces the reviewing aspect of Focused Note-Taking.

To conclude, we see online English Language Arts teachers who have the benefit of solid English Language Arts pedagogy will be able to transfer from the traditional to online environment. These teachers also should add techniques and strategies suggested by brain-based research to fully support struggling English Language Arts students in the online environment. We note that the online teacher has concurrent challenges of students who struggle with school skills and are potentially credit deficient and a school environment that can be challenging both for the student and teacher. By incorporating Brain-Based Learning strategies and techniques, the online English Language Arts teacher can help students see success in school.

A great deal of our discussion began with the biological function of the human brain. It is important for all teachers to have a basic understanding how learning occurs. Teachers who understand how students' brains constantly gather data and process it can plan their lessons to accommodate the processing needs of their students. Perhaps the greatest take away for teachers from Brain-Based Learning is that our student's brains can and do change. Once a teacher accepts this premise, the student learning potential is nearly unlimited. The question of helping our struggling English Language Arts students learn changes from "If they can learn this content?" to "How can they learn this content best?" The idea of planning for and accommodating student brains relates to classroom climate. We see that classroom climate is one major portion of a successful classroom.

As a part of classroom climate, the teacher establishes that every student is unique and has a unique brain. Within those unique brains reside a diversity of experiences, academic and otherwise. The students need their teacher to understand this. The only true way for a teacher to learn about his or her students is to develop relationships with them. We see that the student-teacher relationship is one of the most influential factors in student success. The online teacher

has some challenges, such as lack of physical proximity and difficulty of communication; however, the online teacher can develop relationships with his or her students through synchronous sessions, telephone calls, texting, and instant messaging. Relationships allows teachers to work on general schooling skills.

Some of those general schooling skills are straightforward. For instance, one of the activities that appears earlier is Focused Note-Taking. Taking notes is a schooling skill that will help students for years to come. Other schooling skills are subtler. For example, incorporating Dweck's "power of yet" (*Mindset: the New Psychology of Success* 7) to help students realize that they can learn challenging content and to use growth mindset (Dweck, *Mindset: the New Psychology of Success*) to persevere until they do learn the material. Additionally, we found Pink's formula for motivation: providing our students autonomy (88), encouraging them to seek mastery through flow (113), and giving them work that matters (131). We found that struggling students need skill instruction just as much as they need content instruction. Aside from the focused notes already mentioned, Jensen and Snider provide a list of areas to build cognitive capacity such as self-control, processing skills, attentional skills, memory capacity, and sequencing skills (58). Using these ideas and strategies will help our struggling students see success.

Several of the strategies and techniques have come from teachers and authors who would not strictly consider themselves adherents to Brain-Based Learning. While this might be a difficulty for some, do not let it be. Good teaching, regardless of the philosophical title, takes into account how a student learns best and leverages it for student success. We will look at Jensen one more time: "Brain-based education is learning in accordance with the way the brain is

naturally designed to learn" (*Brain-Based Learning* 4). A teacher that seeks to understand how his or students' minds work and plan accordingly will use brain-based teaching, even in practice without the label.

Works Cited

Abuhamdeh, Sami, and Mihaly Csikszentmihalyi. “The Importance of Challenge for the Enjoyment of Intrinsically Motivated, Goal-Directed Activities.” *Personality and Social Psychology Bulletin*, vol. 38, no. 3, 2012, pp. 317–330.

“Asymptote.” *Math Is Fun*, MathIsFun.com, 2016, www.mathsisfun.com/algebra/asymptote.html.

Atkins, Norman. Foreward. *Driven by Data: A Practical Guide to Improve Instruction*, by Paul Bambrick-Santoyo, John Wiley & Sons, 2011, pp. xiii-xviii.

Barbour, Michael, and Plough, Cory. “Social Networking in Cyberschooling: Helping to Make Online Learning Less Isolating.” *TechTrends: Linking Research and Practice to Improve Learning*, vol. 53, no. 4, 2009, pp. 56–60.

Baddeley, Alan. “Working Memory.” *Current Biology*, vol. 20, no. 4, 2010, pp. R136–R140.

Balm, James. “The Subway of the Brain--Why White Matter Matters.” *On Biology*, BioMed Central Ltd, 14 Mar. 2014, blogs.biomedcentral.com/on-biology/2014/03/14/the-subway-of-the-brain-why-white-matter-matters/.

Bambrick-Santoyo, Paul. *Driven by Data: a Practical Guide to Improve Instruction*. Jossey-Bass, 2010.

Beers, Kylene. *When Kids Can't Read, What Teachers Can Do: a Guide for Teachers, 6-12*. Heinemann, 2003.

Branson, Victoria, et al. “How Do Young People Experience Stress? A Qualitative Examination of the Indicators of Distress and Eustress in Adolescence.” *International Journal of Stress Management*, 2018.

Burns, Martha. “Pay Attention! Why It's Not as Easy as You May Think.” *Fast Forward by Scientific Learning*, Scientific Learning Corporation, 19 Apr. 2016, www.scilearn.com/blog/pay-attention.

Caine, Renate Nummela, and Caine, Geoffrey. “Understanding a Brain-Based Approach to Learning and Teaching.” *Educational Leadership*, vol. 48, no. 2, 1990, pp. 66–70.

Candeias, Adelinda Araujo, et al.. “Student’ Attitudes and Motivation toward Learning and School – Study of Exploratory Models about the Effects of Socio-Demographics, Personal Attributes and School Characteristics.” 4th Annual International Conference on Psychology January 2010, Athens.

Carr, Eileen, and Ogle, Donna. “K-W-L Plus: A Strategy for Comprehension and Summarization.” *Journal of Reading*, vol. 30, no. 7, 1987, pp. 626–31.

"Chapter 3: Focused Note-Taking." *MyAVID* , AVID, 2018, my.avid.org/curriculum/chapter2.aspx?id=28043.

Connections Academy. "Infographic: Growth of K-12 Digital Learning." *Growth of K-12 Online Education Infographic*, Connections Education LLC, 2018, www.connectionsacademy.com/news/growth-of-k-12-online-education-infographic.

Cowan, Nelson. *Working Memory Capacity*. Psychology Press, 2005.

Crockett, et al.. "Restricting Temptations: Neural Mechanisms of Precommitment." *Neuron*, vol. 79, no. 2, 2013, pp. 391–401.

"Cute Puppy." *Meme Generator*, memegenerator.net/instance/48418336/cute-puppy-relax-you-got-this.

Dawson, Peg, and Guare, Richard. *Coaching Students with Executive Skills Deficits*. Practical Intervention in the Schools Series. Vol. 20, Guilford Press, 2012. https://ebookcentral.proquest.com/lib/uwsp/detail.action?docID=868510

Denner, Peter R., and William J. McGinley. "Effects of Prereading Activities on Junior High Students' Recall." *The Journal of Educational Research*, vol. 86, no. 1, 1992, pp. 11–19.

Dweck, Carol S. "Growth." *British Journal of Educational Psychology*, vol. 85, no. 2, 2015, pp. 242–245.

Dweck, Carol S. "Mindsets and Human Nature: Promoting Change in the Middle East, the Schoolyard, the Racial Divide, and Willpower." *American Psychologist*, vol. 67, no. 8, 2012, pp. 614–622.

Dweck, Carol S. *Mindset: the New Psychology of Success*. 2nd ed., Random House, 2016.

Dweck, Carol. "The Power of Believing That You Can Improve." TEDx. Nov. 2014.

Editors at Biology Dictionary. "Sympathetic Nervous System - Definition, Function & Examples." *Biology Dictionary: Sympathetic Nervous System*, Biology Dictionary, 29 Apr. 2017, biologydictionary.net/sympathetic-nervous-system/.

"English Language Arts Standards » Reading: Informational Text » Grade 9-10." *Common Core State Standards Initiative: Preparing America's Students for College & Career*, Common Core State Standards Initiative , 2018, www.corestandards.org/ELA-Literacy/RI/9-10/.

Gallagher, Kelly. *Deeper Reading: Comprehending Challenging Texts, 4-12*. Stenhouse Publishers, 2004.

Gallagher, Kelly. *Readicide: How Schools Are Killing Reading and What You Can Do About It*. Stenhouse Publishers, 2009.

Gathercole, Susan E., and Tracy Packiam Alloway. *Understanding Working Memory a Classroom Guide*. Harcourt Assessment, 2007.

Gerstein, Jackie. "Growth Mindset: Personal Accountability and Reflection." *User Generated Education*, WordPress.com, 13 Sept. 2014, usergeneratededucation.wordpress.com/2014/09/13/growth-mindset-personal-accountability-and-reflection/.

Harackiewicz, Judith, and Stacy Priniski. "Improving Student Outcomes in Higher Education: The Science of Targeted Intervention." *Annual Review of Psychology*, vol. 69, 2018, p. 409.

Hattie, John. *Visible Learning: a Synthesis of over 800 Meta-Analyses Relating to Achievement*. Routledge, 2009.

Hattie, John A.C. *Visible Learning for Teachers: Maximizing Impact on Learning*. Routledge, 2012.

Hero, Melissa. "AVID Socratic Seminar ." Pasco County Schools, 2004. https://pms.pasco.k12.fl.us/wp-content/uploads/pms/2014/08/Socratic-Seminar.pdf

Herrnstein, Richard J., et al. "Teaching Thinking Skills." *American Psychologist*, vol. 41, no. 11, 1986, pp. 1279–1289.

"Hey You Stop Stressing." *20 Best Memes To Let You Know That 'You Got This'*, SayingImages Inspiring Quotes & Pictures, 2017, sayingimages.com/you-got-this-meme/.

"How Is Grade Point Average Calculated?" *National Center for Education Statistics (NCES) Home Page, a Part of the U.S. Department of Education*, National Center for Education Statistics, 7 Apr. 2011, nces.ed.gov/nationsreportcard/hsts/howgpa.aspx.

Hoy, Wayne K, et al.. "Academic Optimism of Schools: A Force for Student Achievement." *American Educational Research Journal*, vol. 43, no. 3, 2006, pp. 425–446.

"Information for Authorizers." *Wisconsin Department of Instruction Charter Schools*, Wisconsin Department of Instruction, 22 Aug. 2018, dpi.wi.gov/sms/charter-schools/information-authorizers.

Jensen, Eric. *Brain-Based Learning: The New Paradigm of Teaching*. 2nd ed., Corwin Press, 2008.

Jensen, Eric. "Chapter 1. Meet Your Amazing Brain." *Teaching with the Brain in Mind, 2nd Edition*, 2nd ed., Association for Supervision and Curriculum Development, 2005. http://www.ascd.org/publications/books/104013/chapters/Meet-Your-Amazing-Brain.aspx

Jensen, Eric, and Carole Snider. *Turnaround Tools for the Teenage Brain: Helping Underperforming Students Become Lifelong Learners*. Jossey-Bass, a Wiley Brand, 2013.

Johnson, Sara B., Robert W. Blum, and Jay N. Giedd. "Adolescent Maturity and the Brain: The Promise and Pitfalls of Neuroscience Research in Adolescent Health Policy." *The Journal of Adolescent Health : Official Publication of the Society for Adolescent Medicine*. U.S. National Library of Medicine, Sept. 2009. Web. 18 Dec. 2016.

Katz, Mark. "Classroom Strategies for Improving Working Memory." *Attention Magazine*, Feb. 2011, pp. 6–9.

Keegan, Nikki. "Socratic Seminar and Creating Prior Knowledge." *Library Media Connection*, vol. 32, no. 3, 2013, pp. 50–51.

Kevaton. "Picture of Henry Ford with Quote 'Whether You Think You Can or Think You Can't You're Right.'" *Get Inspired: 3 Most Important Quotes From Henry Ford*, STEEM, 2017, steemit.com/quote/@kevaton/get-inspired-3-most-important-quotes-from-henry-ford.

Kim, Paul, et al.. "Public Online Charter School Students: Choices, Perceptions, and Traits." *American Educational Research Journal*, vol. 49, no. 3, 2012, pp. 521–545.

Kruse, Melissa. "5 Brain-Based Vocabulary Activities for the Secondary Classroom." *The Reading and Writing Haven*, 11 Dec. 2017, www.readingandwritinghaven.com/5-brain-based-vocabulary-activities-for-the-secondary-classroom/.

Kuhn, Deanna. "Do Cognitive Changes Accompany Developments in the Adolescent Brain?" *Perspectives on Psychological Science*, vol. 1, no. 1, 2006, pp. 59–67.

Lang, James M. "The Distracted Classroom." *The Chronicle of Higher Education*, *The Chronicle of Higher Education*, 13 Mar. 2017, www.chronicle.com/article/The-Distracted-Classroom/239446.

"Learned Optimism." *Alleydog.com's Online Glossary*, Alleydog.com, www.alleydog.com/glossary/definition.php?term=Learned%2BOptimism.

Lemov, Doug. *Teach like a Champion: 49 Techniques That Put Students on the Path to College*. Jossey-Bass, 2010.

Lenroot and Giedd. "Brain Development in Children and Adolescents: Insights from Anatomical Magnetic Resonance Imaging." *Neuroscience and Biobehavioral Reviews*, vol. 30, no. 6, 2006, pp. 718–729.

Lent, ReLeah Cossett. "Chapter 2. Background Knowledge: The Glue That Makes Learning Stick." *Overcoming Textbook Fatigue.* Association for Supervision and Curriculum Development, 2012. http://www.ascd.org/publications/books/113005/chapters/Background-Knowledge@-The-Glue-That-Makes-Learning-Stick.aspx

"Like a Boss You Got This- Anchorman Birthday." *Meme Generator*, ru.memegenerator.net/instance/81042883/anchorman-birthday-like-a-boss-you-got-this.

Littlefield, Jamie. “8 Reason Teens/Parents Choose Online High School.” *ThoughtCo*, Dotdash, 6 Aug. 2018, www.thoughtco.com/why-do-teens-enroll-in-online-high-schools-1098468.

Mandeville, Thomas F. “KWLA: Linking the Affective and Cognitive Domains.” *Reading Teacher*, vol. 47, no. 8, 1994, pp. 679–80.

Marshall, Kathie. “Best Practices: Priming the Student Learning Pump.” *Education Week Teacher*, Editorial Projects in Education, 8 Oct. 2008, www.edweek.org/tm/articles/2008/10/08/05tln_marshall.h20.html.

Marzano, Robert J. *Building Background Knowledge for Academic Achievement: Research on What Works in Schools*. Association for Supervision and Curriculum Development, 2004.

Marzano, Robert J. *What Works in Schools: Translating Research into Action.* Association for Supervision and Curriculum Development, 2003.

McLeod, Saul. “Short Term Memory.” *Simply Psychology*, Simply Psychology, 2009, www.simplypsychology.org/short-term-memory.html.

Miller, Donalyn. *The Book Whisperer: Awakening the Inner Reader in Every Child*. John Wiley and Sons Ltd, 2014.

Mittnacht, Nicholas A. “Virtual Charter School Enrollment, 2002-03 to 2017-18.” *Virtual Charter Schools*, Wisconsin Department of Instruction, 19 June 2018, dpi.wi.gov/sites/default/files/imce/sms/2017-18_VCS_Data.xlsx.

Mueller, Pam A, and Daniel M Oppenheimer. “The Pen Is Mightier Than the Keyboard: Advantages of Longhand Over Laptop Note Taking.” *Psychological Science*, vol. 25, no. 6, 2014, pp. 1159–1168.

Murphy, Elizabeth, et al. “Asynchronous and Synchronous Online Teaching: Perspectives of Canadian High School Distance Education Teachers. (Report).” *British Journal of Educational Technology*, vol. 42, no. 4, 2011, pp. 583–591.

Novak, Joseph. “Results and Implications of a 12-Year Longitudinal Study of Science Concept Learning.” *Research in Science Education*, vol. 35, no. 1, 2005, pp. 23–40.

Ogle, Donna M. “K-W-L: A Teaching Model That Develops Active Reading of Expository Text.” *The Reading Teacher*, vol. 39, no. 6, 1986, pp. 564–570.

Pierce, Cecilia. “Importance of Classroom Climate for At-Risk Learners.” *Journal of Educational Research*, vol. 88, no. 1, 1994, pp. 37–42.

Pink, Daniel H. *Drive*. Riverhead Books, 2009.

Quevillon, Karen. “Online Teaching: 4 Unique Challenges and How to Solve Them.” *Top Hat How-to Guides*, Tophatmonocle Corp, 10 Apr. 2018, tophat.com/blog/online-teaching-challenges/.

Reed, Lora, and Jim Jeremiah. “Student Grit as an Important Ingredient for Academic and Personal Success.” *Developments in Business Simulation and Experiential Learning*, vol. 44, 2017, pp. 252–256.

Reeve, Johnmarshall, and Lee, Woogul. “Students' Classroom Engagement Produces Longitudinal Changes in Classroom Motivation.” *Journal of Educational Psychology*, vol. 106, no. 2, 2014, pp. 527–540.

Riley-Ordu, Sharon, and P. Augustine Ordu. “Seven Levels of Accountability for Student Success.” *AdvancED: Source*, Advance Education Inc., 2012, www.advanc-ed.org/source/seven-levels-accountability-student-success.

Rodesiler, Luke, and Brian Kelley. “Toward a Readership of “Real” People: A Case for Authentic Writing Opportunities.” English Journal, vol. 106, no. 6, 2017, pp. 22–28.

Ruefman, Daniel, and Abigail G. Scheg, editors. *Applied Pedagogies: Strategies for Online Writing Instruction*. Utah State University Press, 2016.

Sarter, et al.. “More Attention Must Be Paid: The Neurobiology of Attentional Effort.” *Brain Research Reviews*, vol. 51, no. 2, 2006, pp. 145–160.

“Selecting the Appropriate Format for Note-Taking.” AVID, 2018.

Seligman, Martin E. P. *Learned Optimism*. Pocket Books, 1998.

“Seriously.” *20 Best Memes To Let You Know That 'You Got This'*, SayingImages Inspiring Quotes & Pictures, 2017, sayingimages.com/you-got-this-meme/.

Sprenger, Marilee. “Chapter 1. Losing Your Mind: the Function of Brain Cells.” *Learning & Memory: the Brain in Action.* Association for Supervision and Curriculum Development, 1999. http://www.ascd.org/publications/books/199213/chapters/Losing-Your-Mind@-The-Function-of-Brain-Cells.aspx.

Stein, Jess. *The Random House College Dictionary*. Random House, 1988.

Stricklin, Kelley. “Hands-On Reciprocal Teaching: A Comprehension Technique.” *Reading Teacher*, vol. 64, no. 8, 2011, pp. 620–625.

Swanson, H. Lee, and Berninger, Virginia W. “Individual Differences in Children's Working Memory and Writing Skill.” *Journal of Experimental Child Psychology*, vol. 63, no. 2, 1996, pp. 358–85.

Tantillo, Sarah. *The Literacy Cookbook a Practical Guide to Effective Reading, Writing, Speaking, and Listening Instruction*, illustrated by Sandy Gingras. Jossey-Bass, 2013.

“Thalamus.” 2012, pp. *Dictionary of Medical Terms*.

"The Five Phases of the Focused Note-Taking Process." AVID, 2018.

"The Synapse." *Khan Academy*, Khan Academy, 2018, www.khanacademy.org/science/biology/human-biology/neuron-nervous-system/a/the-synapse.

The Write Path English Language Arts: Exploring Texts with Strategic Reading Teacher Guide. AVID Press, 2012.

Vanderberg, Robert, and Swanson, H. Lee. "Which Components of Working Memory Are Important in the Writing Process?" *Reading and Writing: An Interdisciplinary Journal*, vol. 20, no. 7, 2007, pp. 721–752.

Wallace, B, et al. "TASC: Thinking Actively in a Social Context. A Universal Problem-Solving Process: A Powerful Tool to Promote Differentiated Learning Experiences." *Gifted Education International*, vol. 28, no. 1, 2012, pp. 58–83.

Wallace, Belle, et al. *Teaching Thinking Skills across the Middle Years: a Practical Approach for Children Aged 9-14.* Routledge, 2012. https://ebookcentral.proquest.com/lib/uwsp/detail.action?docID=1798322

Wallace, S. "Formative Assessment." *A Dictionary of Education*, 2009, pp. A Dictionary of Education.

Watanabe-Crockett, Lee. "The 7 Best Ways to Keep Students' Attention in Class." *Global Digital Citizen Foundation*, Global Digital Citizen Foundation, 16 Jan. 2018, globaldigitalcitizen.org/7-ways-keep-students-attention.

White Matter. (2012). *Dictionary of Medical Terms*.

Wickelgren, Ingrid. "Cognitive Neuroscience: Working Memory Linked to Intelligence." *Science*, vol. 275, no. 5306, 14 Mar. 1997, pp. 1581–1581., doi:10.1126/science.275.5306.1581.

Wiliam, Dylan. "Designing Great Hinge Questions." *Educational Leadership*, vol. 73, no. 1, Sept. 2015, pp. 40–44.

Yeagle, Philip. "Neuroplasticity in Learning to Read." *Science*, vol. 356, no. 6340, 2017, p. 816.

"You Got This and You Know It! Featuring a Baby." *Imgflip*, 2017, imgflip.com/i/1rcz0q.

"You Got This! Good Luck! Featuring a Minion." Topimages.com.

"You Got This Featuring Bill Murray." *22 You Got This Meme*, thuglifememe.com/22-got-meme/.

Zemelman, Steven, and Harvey Daniels. *A Community of Writers: Teaching Writing in the Junior and Senior High School*. Heinemann, 1988.