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# Engagement Through Brain Breaks in the Secondary Classroom

Sheryl F. Morton

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BREAKS

Engagement in Secondary Education: Teachers Implement Student Brain Breaks in the  
Classroom

## ENGAGEMENT IN SECONDARY EDUCATION THROUGH BRAIN BREAKS

Engagement in Secondary Education: Teachers Implement Student Brain Breaks in the  
Classroom

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## ENGAGEMENT IN SECONDARY EDUCATION THROUGH BRAIN BREAKS

## Abstract

This paper explores the concept of student engagement using brain breaks in the classroom through the responses of secondary education students and secondary education teachers. A review of the literature reveals that students in the classroom may require movement following transmission of information from their teachers or rest time in order to physiologically process newly transferred information. With the federally mandated policy of No Child Left Behind (2002), the added accountability stressors, teachers are more conservative with time spent in the classroom. In a collaborative, risk taking, effective school culture teachers are encouraged to continuously seek out new ideas and instructional experiments in the classroom (Gruenert & Whitaker, 2015, pp. 71 & 89). Student engagement is required for effective teaching. One approach for effective teaching is for teachers to increase their awareness of recent research of methods to increase brain activity in their students, such as can be found in the field of neuroscience. Increasing their understanding of the biology of learning will guide teachers to the teaching practices that will maximize student learning (Erlauer, 2003). A qualitative study will determine secondary student and teacher opinions of brain breaks and their impact on engagement.

*Keywords:* brain breaks, student engagement, teacher effectiveness, neuroscience

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## ENGAGEMENT IN SECONDARY EDUCATION THROUGH BRAIN BREAKS

### **Introduction**

#### Motivational Secondary Education: Enhancing Engagement through Kinesthetic Movement Using Brain Breaks

People, who reflect on their time spent as students in high school, will most likely focus first on their most positive or negative experiences. Recalling a class where it all came together: peers, teacher, content, challenge, and learning, will depend on the individual's cultural interpretation of that memory. Although recollections may not accurately depict the experience as it actually occurred, people will remember how the experience made them feel: bored, defeated, intrigued, or empowered. Engagement is a critical component of academic success (Yonezawa, Jones, & Joselowsky, 2009) and creating positive memories of student experiences today is possible, by determining engaging methods of learning, and effective teaching approaches. Today, teachers can work in a brain-compatible environment that allows students to benefit from successful learning (Erlauer, 2003). Scientific research reveals that the human brain can effectively take in up to forty-five minutes of information before its ability to take in any more new information diminishes, especially in younger minds. Allowing the brain a break through mental, emotional or physical release reduces stress and refreshes the mind (Bernstein, 2011).

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### Literature Review

A line from musician and lyricist, Kurt Cobain's "Smells Like Teen Spirit," paints a visual of the expectant faces of secondary students, looking to their teachers for an extraordinary learning experience: "Here we are now, entertain us!" (Cobain, Grohl, & Novoselic, 1991, track one). An increasingly important challenge that teachers are facing is keeping their students from becoming disengaged, while rigorously instructing to standards-based assessments, proficiency-based diplomas, and focusing on core subjects. Such pressures may stifle teachers' creativity in applying resourceful, engaging, and yes, fun teaching methods in the secondary classroom. Teachers may feel that the Nation is putting them under heavy scrutiny. *No Child Left Behind* (NCLB), a federal law enacted to hold teachers accountable to increase achievement scores for all students, has exerted pressure on teachers and districts to "teach to the test," or face the potential of a loss of district funding (No Child Left Behind [NCLB], 2002). "The call for accountability has brought an urgency to schools that feels more like panic," and has burdened the moral of school culture and teacher student relationships (Gruenert & Whitaker, 2015, p.5). Students take the brunt of such legislation, as the added accountability stressors can leave an impression that there is not a moment of academic time to waste for teachers. Teachers then "force feed" too much information to students without an allowance of adequate time to make connections, whereby learning is sacrificed in the name of expediency (Medina, 2014). What teachers teach and how it is taught is "crucial to facilitating student achievement, especially in this age of accountability," (Radin, 2009, p. 42). In a collaborative, risk taking, effective school culture teachers are encouraged to continuously seek out new ideas and instructional experiments in the classroom (Gruenert & Whitaker, 2015, pp. 71 & 89). Under the umbrella of current

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mandates, effective teachers can still implement positive and joyful learning experiences and still gain expected, higher levels of academic achievement required by NCLB (2002). When educators respond by reexamining their own behaviors and attitudes, they can then genuinely shift student interest in the school culture and thereby foster increased engagement in learning (Gruenert & Whitaker, 2015, p. 140). This, with an allowance of consistent breaks, teacher expertise may be transferred to the novice learner effectively (Medina, 2014).

The primary objective of effective teachers is to engage students in the learning process, so students learn and retain information, which can then be applied critically in other contexts (Yonezawa, et al, 2009). Teachers may achieve this when they increase their awareness in recent research of methods to increase brain activity in their students, such as can be found in the field of neuroscience. Humans are equipped with naturally evolved skills and abilities, whereas expectant learning has been conditioned, occurring when the brain expects visual, auditory, or tactile stimulus (Hall, 2005).” Effective teachers will also engage their students through the democratic process of honoring student voice and designing their classroom environment as a place to integrate tactual and kinesthetic activity throughout students’ academic day to increase brain activity. Brain breaks may also be an effective way to reengage students during the standard high school, eighty-minute class period. Research in neuroscience has revealed that younger students experience increased brain activity following a brain break, yet this is not a common practice in the secondary setting. In view of teachers’ impact on student learning, it is worthy to note that for older brains to teach younger brains for optimal effect, cognitive neuroscience can inform education and education can inform cognitive neuroscience (Geake, 2009).

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### **Student Engagement and Neuroscience**

Understanding effective ways students learn is as important as the content being taught. Educators now have to be knowledgeable of “educational psychology, biology, cognitive science, neuroscience, and pedagogy” in order to evolve from the Industrial Age teacher mentality and be functionally effective in the Information Age (Radin, 2009, p. 41). Teachers who are professionally aware of cognitive neuroscience recognize how in theory, this can affect their teaching practice (Geake, 2009). Brain-compatible instruction incorporated into classroom practice increases student achievement. “The ability of the brain to change as a result of learning, or in response to environmental changes, is known as ‘plasticity’” (Hall 2005, p. 2). With respect to brain compatible-instruction, teachers may incorporate strategies of group projects, multiple intelligences, and challenges into lessons to engage their students in the learning process in an “enriched environment” (Radin, 2009, p.44). These strategies create educational experiences, which drive changes in brain activity.

The human brain, which developed during evolutionary, nomadic periods, innately craves movement and responds to intelligence boosts through exercise. Movement increases the brain’s ability to strengthen “long-term memory, reasoning, attention, and problem-solving tasks” (Medina, 2014, p. 2). Most secondary students are desk-bound, in industrial era designed classrooms, contrary to this human instinctive requirement. When a student remains in the same desk space daily, the learning becomes associated with the location with no particular memory trigger. Memory is improved when the student changes location when learning something new (Erlauer, 2003) The standard class day for high school students is made up of four 80-minute block classes, where the students are therefore sedentary for the majority of class time. Teachers

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then expect their students to be sitting, to do so quietly, ask questions only when called upon, and take notes, and by all means, pay attention.

Teaching and learning is a reciprocal, specialized form of social interaction, dependent on the design and delivery of educational curricula and should intrigue student curiosity. There is not an agreed upon definition of curiosity in neuroscience, but if students are given allowances to remain curious, they will continue to engage through natural tendencies of discovery and exploration. There is a healthy balance between entertainment and education, or a combination of the two, known as edutainment. Students can have fun and learn through active lessons that involve movement, not necessarily edutainment, in the classroom (Erlauer, 2003). In an essay written for MIT, Professor of Learning Research and designer of educational toys, Mitchel Resnick (2004), contrasted edutainment to what he referred to as “playful learning.” Resnick (2004) reported that he views the edutainment industry as; one that describes the educational experience as “bitter medicine that needs the sugar-coating of entertainment to become palatable,” something students must suffer through (n. pag.). This is not the message teachers will want to relay to students. What effective teachers will want to relay is they want students to take ownership of their education, which may be palpable through a lesson that has meaning, and sparks student interest. Meaning can be brought to fruition by using the senses. The educational activities that Resnick (2004) referred to as playful learning, require tactile and kinesthetic movement, which can be very creative to the senses. These activities promote intrinsic motivation rather than external motivation (n. pag.). Intrinsic motivation stems from authentic interest and drive. When students are engaged in creative, active learning, they begin to think

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independently of extrinsic rewards, and focus on a higher purpose found through self-directed accomplishment, rewarded by self-satisfaction.

When teachers and administrators place increasing value and energy on utilizing every classroom moment for the purpose of transmitting information, required knowledge strictly for assessment purposes, they may neglect to see how activity can increasingly leverage student interests and passions in learning through enhancing critical thinking skills. “Brain research confirms that physical activity – moving, stretching, walking – can actually enhance the learning process” (Jensen, 2000, p. 4). Effective teaching can be obtained through utilizing research-based methodologies that integrate motivators driven by activity happening in the classroom. Effective teachers can implement a motivational climate of intrinsic, task and goal oriented students and perceived competence. Acknowledging the innate, adaptive desire to learn in an environment conducive to exploration and encouraging curiosity is a condition of effective teaching (Medina, 2014).

### **Student Engagement Through Effective Teachers**

To be effective, teachers should be knowledgeable that the brain and the body work together and how this impacts the way in which students learn (Erlauer, 2003). “Most developmental psychologists believe that a child’s need to know is a drive as pure as diamonds and as distracting as chocolate” (Medina, 2014, p. 255). How students receive educational instruction stems from the fact that “Federal and state guidelines define ‘highly qualified’ teachers, and states have been charged with measuring teacher effectiveness” (Williams, Sullivan, & Kohn, 2012, p. 105). Federally mandated education standards are “the driving force behind educational decisions, program development, material selections, and daily lesson

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planning,” an important variable in all grade levels in American schools (Radin, 2009, p. 42).

One defining benefit of the standards is that it has teachers and students now working together toward a mutual goal of student academic achievement. To successfully teach toward student engagement, teachers will need to review teaching practices of a one-size-fits-all nature. “‘Chalk and talk’ lectures with required note-taking, assigned readings, and end-of-chapter, or end of text questions” may still be practiced in the Twentieth Century style, industrial style classroom (Honigsfeld and Dunn, 2009, p. 220). These antiquated methodologies compared with alternative methods that “both accommodate and demand other kinds of intelligence” may be inhibiting to student engagement (Pirie, 1995, p. 46). This approach does not apply strictly to students with disabilities. Practicing “alternative ways may broaden the range of their styles of learning... to encourage valuable restructuring of understanding” for all students (Pirie, 1995, p. 46). A three-year study, *Measures of Effective Teaching Project* (MET), funded by the Bill & Melinda Gates Foundation, surveyed/studied approximately 3,000 teachers, including secondary teachers, and their students, including secondary. This study covered six different, American school districts, reported that students favorably identified teachers that “challenge: in this class we learn to correct our mistakes” and “captivate: I like the way we learn in class” as the highest rankings among classrooms in both, the 25<sup>th</sup> and 75<sup>th</sup> percentiles (Gates Foundation, 2013, Press Release, n. pag., Asking Students, Figure 1). Another effective educational reform is democratic classrooms.

Democratic classrooms are climates of mutual respect and relationship building among students and teachers to prepare students to be individual thinkers and independent learners and place students at the center of educational reforms (Levin, 2000). With the requirement to

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increase rigor and utilize every classroom moment to transfer knowledge, students are being denied a challenging and stimulating classroom experience. It is when students see a purpose for engagement and themselves as agents of change that engagement and academic performance improves. Students are the recipients of learning through engaging practices and effective teachers recognize their voice. (Yonezawa, et al, 2009). An effective teacher will not presume their position is to simply provide answers and solutions to problems. Teachers need to be cognizant that the “learning experience belongs to the students” (Williams, Sullivan, & Kohn, 2012, p. 109). As a rule, Resnick believes that when a student is “engaged as an active participant, not a passive recipient,” they will be more likely to learn (2004). Activities that require hard work, perseverance, problem solving and challenge can provide students with opportunity for engagement so long as the learning is relevant to the secondary level student (Resnick, 2004). “When students are responsible for the discovery of the information and have a purpose and ownership of the information, the odds are they will learn (Erlauer, 2003, p. 57).

### **Student Engagement Through Student Voice**

Students can draw their own conclusions about a lesson’s relevance and its future application and as students become older, the more critical it is for their learning to be meaningful. Secondary students need to know that it will be worth their time and effort to learn new information and the brain requires this relevance to learn efficiently (Erlauer, 2003). Student opinions and input are valuable resources on teacher effectiveness, which have taken on an increasingly vital role in student evaluations of teacher performance. In her book *Fires in the Mind: What kids Can Tell Us About Motivation and Mastery*, Kathleen Cushman (2010) revels in student voice, quoting their responses to varied learning practices in the classroom. Cushman

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uses the quotes of ninety-two diverse students from seventeen schools, located in nine different cities and towns in the United States. Student, Rachel M. had this to say: “There’s a diversity in the types of learning that we do and the types of knowledge that we acquire” (Cushman, 2010, p.157). Student, Karen said: “I like the idea that maybe some teacher will actually consider all of what we’ve been saying and actually use it in their classroom...they could actually do things that make them (students) care” (Cushman, 2010, p.157). There is an “eagerness to enter into a shared community of practice in which young people and adults aim for the same high standards and support each other in the journey toward mastery” (Cushman, 2010, p. 154). Curriculum delivery as student-centered and interactive creates the desired independence in learners.

In a study that sought student opinion from successful young, black men, the researchers paid high regard to the thoughts and input from this educational clientele. In this theoretical study that used 223 letters from students, intended to authenticate student voice, the “three most frequently mentioned teacher characteristics included a caring attitude, knowledge of the subject and how to teach it, and classroom management skills” (Williams, Sullivan, & Kohn, 2012, p. 105).

In the MIT project, researchers found that “no one has a bigger stake in teacher effectiveness than students. Nor are there any better experts on how teaching is experienced...” (Gates Foundation, 2013, Final Report, para. 1). “Students may be the most compelling agents of change we have... Rather than thinking of students as benefactors of change, researchers might consider them as participants in change.” And as importantly, “by listening to students in their earlier years, we are teaching them social responsibilities and democratizing young people” (Williams, et. al., 2012, p. 109). “Active learning is for educators who understand the science

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behind the learning” and educators who are listening to their student’s preferences to learning

(Jensen, 2000, p. 37).

Student voice is heard in democratic education. The Institute for Democratic Education in America (IDEA, 2011) refers to democratic education as “learning that equips every human being to participate fully in a healthy democracy.” Democracy is taught in American schools and through the experience of Democracy in the classroom, students can make meaningful and authentic connections to the very democratic government they live in.

Students may use their voice in curriculum and classroom design. It is important for teachers to allow students the opportunity to make connections in their learning through meaningful brain activities to link new and prior learned knowledge. Making connections increases relevance and builds student confidence. For students of any age to digest newly transferred information, they require consistent breaks to make those connections (Medina, 2014, p. 119).

### **Student Engagement Through Physical Movement**

Human experiences, which utilize as many of the senses and learning approaches tend to be more memorable and can lead to retention of what is being taught. “Typically, students move (kinesthetically), see others move (visually), talk about it (verbally and interpersonally), and reflect on it (intrapersonal) (Pirie, 1995, p. 50). The types and amount of physical movement has an affect on students’ brains and their learning ability whereas an active learner benefits from clear understanding and long-term memory of concepts (Erlauer, 2003). Bautista, Rolf, and Thom (2012) researched a theoretical, radical approach of knowing, “arising from incarnate forms of consciousness” which suggests comprehension occurs following bodily performance of

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a task; a post-kinetic phenomenon” (p. 383). The study views manipulating objects, such as geometrical shapes, and problem solving as more or less an innate primitive act – to instinctively act and enact (Bautista, et. al., 2012). Student engagement through tactual and kinesthetic learning is not a new concept. One could even look as far back as Aristotle, which Marie Montessori (1870-1952) did. Montessori, who studied neurology, promoted hands-on manipulation over direct instruction in her earlier schools, a practice that continues worldwide today. Montessori believed in integrating educational instruction that utilized all five senses. Montessori understood that movement and manipulation through sensory education heightened intellectual ability in students. Montessori began using this educational approach with preschool children and gradually included children of all ages. Montessori thought education’s aim for secondary students was deeper than the dry imparting of knowledge but should move toward human development ([michaelolaf.net/montessori12-18.html](http://michaelolaf.net/montessori12-18.html)).

In a study that looked at the relationship between learning styles and academic achievement of high school students, the “major results of the study suggest that the majority of our high school students are Tactile/Kinesthetic and Global learners (Snyder, 1999, p. 1). Honingsfeld and Dunn (2012) recommend tactual and kinesthetic instructional resources for students who process globally, demonstrate a disinterest in school, are nonconforming, have difficulty sitting still and paying attention, or do not comprehend what they have read. Honigsfeld and Dunn’s (2012) research, and the research of others have shown, that these students do not respond to traditional teaching methods but do become engaged in “hands-on, activity-oriented lessons” (p.221). Their findings “revealed significantly increased achievement as well as higher levels of engagement and motivation” (Honigsfeld and Dunn, 2012, p.221).

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Resnick (2004) makes reference to studies that have found youth who demonstrate short attention spans in the classroom, show an increase in concentration when engaged in projects they are truly interested with. Sitting at a desk, listening to a lecture does not work well for all adolescents. These students process and “internalize comprehensive information while using small or large motor movements, rather than while remaining stationary and passively receiving input from the teacher” (Honigsfeld and Dunn, 2012, p. 221).

Resnick (2004) prefers things students “do” through creative projects, rather than what things others may provide students with through edutainment. These creative projects can be done through new technologies, such as examples of manipulating digital images and creating animations on a computer (Resnick, 2004). Another example was using crickets; tiny hand-held computers that make constructions come alive through manipulating touch and light sensors (Resnick, 2004).

Sitting for long periods of time reduces deep breathing, increases spinal pressure, and strains the eyes. When students are given the opportunity to move during a lesson, experience a decreased amount of physical fatigue and are better able to concentrate with efficiency on concepts and tasks. Teachers can utilize movement through a brain break from instruction. Following a physical brain break, blood flow increases brain activity in students, allowing the brain to remain alert for learning (Erlauer, 2003).

### **Student Engagement Through Brain Breaks**

To increase brain activity and retention of information, teachers can provide opportunities for frequent movement through standing, stretching, or exercise. Brain breaks are another form of changing the physical and mental state of learners in the classroom. These active and

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stimulating breaks do not require a lot of time to reenergize students and bring them back to focus. Merely standing up in the classroom can increase the blood flow in a student's body and increase oxygen to the brain and can improve students' attention. ((Erlauer, 2003).

When a break is scheduled, the students may also be less likely to interrupt teachers who are in the midst of teaching, or a group is in the midst of collaborating on a project. The brain break is a tool backed by research that has been shown to improve student concentration and as a stress reliever. A physical brain break will allow the students free physical movement, which will stimulate neurological pathways of the brain. A kinesthetic brain break scheduled thirty minutes into the eight- minute class period. Teachers consider every moment of instructional time valuable. A willingness to incorporate a few minutes of class time will increase student focus and engagement. The human brain changes its structure and function in response to experiences. Human survival has depended upon "chaotic, reactive information gathering experiences." (Medina, 2014, p.253). The discovery by neuroscientists that the part of the brain, cerebellum, linked to learning increases its operational capacity when the student is moving, even through changing locations, improves memory (Erlauer, 2003).

### **Research Design**

#### **The Purpose of the Research**

This study sought to uncover secondary students opinions on brain breaks and their impact on engagement during an eighty-minute class period. In addition, this study examined whether secondary students found a difference in their ability to process information transferred during an eighty-minute class period following a brain break and whether teachers found any difference in secondary student engagement when a brain break was implemented during an eighty-minute class period.

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There was not a scheduled break originally placed in the schedule for any of the selected classes, which was initiated for the purpose of this study. The purpose was to collect data to determine the effects of brain breaks during long class periods for high school students in a current, research-based learning study that utilized brain breaks in teaching and engagement in the general education learning environment. A qualitative study was conducted to answer the following questions: Will the use of brain breaks implemented in the secondary classroom increase engagement? How do students and teachers perceive the practice of brain breaks in the secondary classroom as beneficial to student engagement?

A stagnant teaching methodology and learning environment occurs when students are required to sit still in a desk for an eighty- minute learning sessions without a supplemental, scheduled break to process new information.

This study sought to uncover secondary students opinions on brain breaks and their impact on engagement during an eighty-minute class period. In addition, this study examined whether secondary students found a difference in their ability to process information transferred during an eighty-minute class period following a brain break and whether teachers found any difference in secondary student engagement when a brain break was implemented during an eighty-minute class period.

### **Research Questions**

Would implementing brain breaks be conducive to reenergizing the brain, and re-engaging students in learning?

How might increased engagement and neural activity amongst students from brain breaks be measured or characterized?

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How might students and teachers perceive the practice of brain breaks in the secondary classroom in regards to engagement?

### Time Frame and Participants

The student population for this study included male and female minors under age eighteen, from a population of freshman and sophomore high school students currently enrolled in this local district. At the time of the study, the total population of high school students was sixty-four. After receiving approval from the Institutional Review Board (IRB), I began the study in January 2016 by receiving on-site permission from the district superintendent and the K-12 school principal. I then recruited two willing teachers, and received their permission to participate in the study. I sent out a total of thirty-four participation request forms to parents and their students. I received permission from thirty-one students and their parent or guardian, and one student was moved out of the classroom before the study commenced. The research began when all permission forms were received, and continued until April 2106. The field study of classroom observations occurred during the second and third period classes, with each content class occurring on alternate days. The second period class followed high school breakfast break, and the third period class occurred right before high school lunch.

**Table 1 Student Totals**

Student Participants			
Grade Level	Male	Female	Total
9	5	8	13
10	5	12	17
	10	20	30

The sample size for the study consisted of thirty students. Seventeen students were sophomores, and thirteen were freshman, with a ratio of females to males of 2:1. The students

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surveyed ranged in age from fifteen to sixteen, for a mean age of 15.37. The student population surveyed was ninety-seven percent Caucasian, with three percent Hispanic. The two teachers involved in the study were a high school history and English teacher, both employed by the district. One teacher was male, and the other female. Both teachers had over ten years of experience, and both teachers were Caucasian.

From the student population of thirteen freshmen and seventeen sophomores, the entire freshman class participated and all sophomores chose to participate, minus three. The sophomore non-participants were two male and one female. The population of the participating group is predominately white with a mixed socio economic status of low-income, working-class, and middle-class students. The participants were chosen based on their grade levels, because of my access to freshman and sophomores as the researcher. These groups can also be described as representative of a recently transitioned group from middle school to high school, and a group that is experiencing high school for a second year.

The data was not disaggregated, as all reports were anonymous.

### **Methodology**

#### **The Method of Inquiry**

“Educators have become more aware of the research that has been done by cognitive and educational psychologists in the area of learning styles and multiple intelligences” (Snyder, 1999). When teachers change up assignments and teaching approaches, this should keep students on their toes and continue to challenge them. When students are not engaged, the learning process is interrupted and progress toward achievement stalls. Effective teachers should be observant of when their students are inattentive, bored, or continuously fail at previously used

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teaching practices. Students merely “hope to bring a fresh sense of awareness, engagement, and energy into teaching and learning, no matter what their setting” (Cushman, 2010, p. 154).

This study was implemented to investigate the theory of using brain breaks with secondary students to maximize their engagement during an 80-minute course. Educators are faced with the substantial task of promoting classroom environments conducive to student engagement. Relevant to such engagement is the retention of information and improved educational performance. This research was conducted as a qualitative study.

The data was collected through anonymous responses. I used a student and teacher pre-survey, student and teacher weekly observations, and student and teacher post-survey (appendices G, H, I, J, K, & L). These surveys and observations were sent via Google survey to all participants and independent responses were sent directly to my secure email. The participation rate varied week to week for observations.

### **The Central Concepts Related to the Investigation**

Researchers have expanded upon the uni-dimensional concept of engagement and sought a multidimensional interpretation, which simultaneously includes behavioral, cognitive, and affective components of engagement (Yonezawa, et al, 2009). Effective teaching compliments student engagement, which then promotes student achievement. Can student input compliment effective teaching? If asked, would students respond that they would enjoy more tactual and kinesthetic activities in the secondary curriculum? Perhaps offering students the freedom to choose is what promotes their learning. “Although numerous research studies list outstanding teacher characteristics, there are fewer in which students are asked their opinions” (Williams, et. al., 2012, p. 108). Teachers may underestimate the value student input can have on their

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effectiveness, when students share their ideas on teaching approaches that work well for them.

Teachers were once secondary students themselves. By reflecting on their own educational experiences, teachers can recall teachers they had positive, reciprocal, lasting learning experiences from, and ask themselves what the appeal was. After all, experience is the greatest form of education. “If we want students to learn more, teachers must become students of their own teaching” (Bill & Melinda Gates Foundation, 2013, Final Report, n. pag.).

### **Background and Location**

#### Personal

My background is of an educator, a student, and parent. I empathize with the students as I observe their behaviors of battling boredom, as they appear to lose interest in a lengthy lecture. I presently work as a special education teacher in grades seven through twelve. I began as a parent volunteering in the school, was hired as a substitute for all grades in all content areas, and did this for several years. I then accepted a job from the special education director as an educational technician, and did this for several years. I did not begin the journey into special education as a personal choice, but more of a calling to provide students with educational experiences enhanced to their needs. When the general student population was introduced to differentiated learning, developing habits of mind and work, and metacognitive teaching approaches, I saw clear parallels in what was being done in special education. I support the idea of individualized learning for all students, with a focus on their strengths and improving their weaknesses. I also advocate for teaching with the knowledge that the students are pre-adolescent and adolescent children, with a biological clock that has been keeping time with nature for thousands of years. No matter what the educational approach du jour, students will remain

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adolescent humans with the same strong needs for occasional movement, to reinvigorate and reenergize their minds and bodies.

My professional background in special education has offered the opportunity to view the student as a whole, and to take into consideration all internal and external factors that impact the student's learning. This same comprehensive approach applied to all students gives a fair read on what is effective and what is ineffective in their learning. Teachers, who listen to their students through observations, student feedback, and results, will promote the richest learning environments, by seeing the improvements necessary to promote solid twenty-first century learners. I recognize that it is my job to serve these adolescents, who will then in turn serve society. The skills and knowledge we impart as educators is best implemented with mutual respect. I respect students as the individuals they are, with differing backgrounds and needs, and as the young men and young ladies they are developing into, which includes ongoing regard to their biological and neurological processing. It is unfeasible to expect students to take in all they are being taught without giving them opportunities to rise and move, and make a free choice of how they would like to spend an independent five minute brain break. Allowing for the break acknowledges that we as adults understand the need for a moment to stretch and process in order to remain engaged. Referring to this rest period as a brain break relays the importance of utilizing their brain to its maximum ability. This helps the student become self-aware of actually utilizing the organ of their brain. Much like the body builder who focuses on a particular muscle group when they are working out, with momentary rest in between repetitions, a brain break will provide students with a rest before re-engagement.

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### Social

I will always promote education as the catalyst for changing lives for the better through applying what is best for student learning in an ever-changing world. I often hear parents at Individualized Education Program (IEP) team meetings discuss their personal experience in school as a negative one. What they all have in common, is that they want their child to have a positive educational experience and not to go through what they did, leaving a bitter academic aftertaste lingering many years after departing the school environment. To end a perpetuating cycle, we as educators can change the outcome by listening to students and being perceptive to student wider needs. Allowing for a brain break may be a minor change in the classroom schedule, but perhaps what happens during it can be much more, and come to be remembered by students as constructive. This break shows respect to a learner by trusting them to use the time to their advantage, and highlights the connection between the body and mind; how one system inevitably impacts the other. Researchers recognize that humans require short breaks before re-engaging with the task or lesson at hand, and students who know that teachers respect the difficulties of learning, are willing to adjust to an approach that works for them as individuals.

### **General Writing**

When their environment through physical movement stimulates students, they become engaged, and more cognizant of learning as a process. Making important connections that allow one to overcome academic obstacles builds a strong foundation. By allowing students to apply what they have learned through the use of tactile and kinesthetic activities, integrated brain-breaks can make the classroom a place for secondary students to enjoy, a place where they have a voice in the curriculum. Effective teachers may wish to note that learning is often “sacrificed

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in the name of expediency” (Medina, 2014, p.119). Rather than persisting in practicing stagnant methodologies where students are required to sit still in a desk for eighty minute learning sessions, implementing a brain break seems a logical way to maintain the energy and overall engagement of the students by allowing them time to digest what’s come before.

### **Operational Measures**

Data collection took place over a period of approximately four months, during the 2016 school year, through pre-surveys, weekly surveys, and post surveys from both the students and the teachers. The data has been organized and transcribed from the different types of student pre-surveys, student weekly questionnaires, student post-surveys, teacher pre-surveys, teacher weekly questionnaires, and teacher post-surveys. Categories were then compiled to develop a theory about the impact of brain breaks for the students.

### **Data collection**

Following the process of obtaining permission from the school’s superintendent, principal, teachers, students, and parents, quantitative data was collected during the months of January through April, 2016, from: secondary teacher and student pre-surveys, weekly questionnaires, and post-survey responses. Observation: Field notes gathered by myself as the researcher. The data reveals student responses to taking a scheduled brain break during an eighty-minute class period and teacher responses of their observations of student levels of engagement following a brain break. The data revealed preferences in utilizing brain breaks in the general education setting for secondary students and secondary teachers.

### **Data Analysis**

The theoretical phenomenon of implementing brain breaks contributing to engagement

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for secondary students was determined through the analysis of this qualitative data. The research instruments of student and teacher pre-surveys, post-surveys, and weekly surveys, along with my own field observations provided triangulation of varied perceptions, intended to eliminate bias. The variables observed through the study were implementing a newly introduced brain break to the students and teachers in a secondary setting, the brain break's impact on student engagement, and effect on independent requests to leave the classroom before or after the brain break.

The collected data from the student and teacher surveys and questionnaires was read and reread, interpreted, and coded to identify consistent themes. Six prominent themes were then chosen from the most frequently used student responses. Researcher field notes were transcribed and compared to the collected data from participants.

### **Expected Findings**

Students will respond to the brain breaks through a change of engagement in the classroom. After experiencing a brain-break during an eighty-minute class, students will report a change in their ability to focus and engagement and to process information received within the prior forty-minutes through the scheduled brain break. The teacher(s) will find that the breaks impact student engagement, and students will process newly transmitted information differently with a brain break than without one.

### **Potential Issues and Weaknesses**

Potential issues may be that the teachers have difficulty adapting to a break within the eighty minute scheduled class. The teachers may also find that the research interrupts their teaching with regard to time constraints. The weaknesses are that the scheduled classes observed

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occur on an alternating schedule of every other school day. The school involved does not offer a large population of students, which minimizes the sample.

### **Bias**

My personal bias may lie in my own experiences in high school when the teachers droned on, and all I could think about was my after school plans with my friends and what the weekend would hold. As much as I wanted to remove myself from the classroom in high school when I found the learning environment dull, I never waylaid from my love of learning. I learned to learn on my own, because my teachers were not providing me with my interests and meeting my academic needs. Rather than discourage me from continuing to learn, this instilled a determination that I would support student learning through effective engagement methods.

### **Theoretical Foundations**

The findings of this study have important theoretical implications on learner-centered teaching, learner engagement theory, teaching and learning styles, and student voice. Through the implementation of brain breaks in the secondary classroom, students found this helpful in promoting their engagement and participation, clearly stated in their post-evaluation responses (figure 2). Didactic teaching through lengthy lectures increases the need for student brain breaks.

### **Research Narrative**

#### **Journey to the Question**

I began the journey to my research question when my in-class support time with students as a special education teacher was increased. With a push toward inclusion, more of the students I worked with were finding placement in the general education setting with their peers. When I

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worked with the students in small group settings, the curriculum was designed to encourage engagement during learning with consideration to breaks for the students during the time they worked with me. As I entered the regular education classroom setting at the high school level, I found myself wondering how I wound up back in the classroom, reliving the challenge of sitting quietly, listening to lengthy lectures, watching the clock, wondering what was for lunch and waiting for class to end.

There is limited collaborative teaching at this time in the district I work in, so I sat quietly through the lectures and lessons, supporting the students when needed. As I attended these classes, I could not help but observe all the students in the general education setting and fidgeted, made side conversations and frequent requests to leave the classroom, yawned, doodled, and ate; all of which the students used take a much needed mental break from the classroom. A new distraction for students from when I sat in a high school classroom is exploring the web; it's easy to spot the checking of cell phones, but a bit harder to see the furtive plugging in an of an earpiece to listen to music. Considering the disruptions and loss of instruction time caused by these behaviors, I wondered if regular brain breaks would make students less inclined to leave the classroom at unscheduled times. Perhaps a built-in opportunity to move from their stagnant positions would decrease the inefficiency I was seeing. Furthermore, this break might also allow students to better process what they were introduced to in the classroom during that period.

I then began looking into methods of engaging students. I researched the impact physical movement had on the brain. I sought out new information on neuroscience and how this study provides educators with new information on how students process what they learn. With the

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chemistry of these concepts, I thought a simple solution would be to allow students a short break during an eighty-minute high school class.

### **Metaphor**

Time is a resource. Time can be well-spent, killed, wasted, lost, valuable, budgeted, and precious to educators. It is said that time heals, drags, is fleeting, and that we often race against it. Some teachers are watching the clock more often than the students during class. The pressure to impart the knowledge they feel they must before the students leave their classroom causes educators to make every minute count. Teachers begin the school year knowing they have one hundred seventy-five school days for instruction. In high school, the classes meet every other day, which narrows the time spent for a particular content curriculum. The testing arena has broadened to include mandatory district and state testing. No Child Left Behind (NCLB) has now been replaced with the Every Student Succeeds Act (ESSA). There are some notable changes in ESSA, but the pressure of high standards for teaching and learning remains the same.

Time as a resource prevents teachers from letting their guard down. Asking for a five minute brain break is asking teachers to relinquish a precious five minutes that might otherwise be used to further instruction and therefore potentially improve standardized test performance. Or so they think. Research has shown that given the opportunity to take a break, students are able to increase classroom engagement and process that newly transferred information, not to mention alleviate boredom. The price of a few minutes can lead to a wise investment of time, by allowing students an opportunity for aerobic movement, meditation, or a temporary leave from the confines of the classroom.

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The perspective of time from an educator's point of view and that of an adolescent can at times be stark. As slowly as the clock may seem to tick for a student during a lecture, time may be speeding past for the teacher with so much content to cover.

### **Findings**

Using student input, teacher input, and classroom observations provided a broad spectrum of data. The independent variable was the scheduled brain break. The dependent variable of increased engagement following a brain break was measured by student responses to the Student Pre-Survey question five (figure 1) and the student response to the Student Post-Survey question one (figure 2). The graphs depict that 46.4 percent of students reported that brain breaks would somewhat help them to remain engaged in the pre survey (figure 1). 73.1 percent reported that brain breaks did change their ability to remain engaged in the post survey (figure 2), indicating a student perception of increasing engagement, following brain breaks by just under 30%. The students who responded to the pre-survey had not experienced brain breaks in their secondary classrooms prior to the experiment. The implementation of the breaks swayed student opinion through this experiment,

Student pre-survey Figure three represents the amount of times a student specifically requests a break to leave the classroom when brain breaks are not scheduled. 39.3% stated they leave the classroom at least once per class period. 14.3% shared that they request to leave the classroom, and 17.9% said they never requested leaving the classroom. This data has been impacted by 28.6 % of non-respondents.

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Student pre-survey Figure four is based on what students do when they request a moment to leave the classroom. 17.9% visit the restroom, 10.7% go for a walk, 7.1% chose other and 28.6% chose all of the above. A 28.6% non-respondent group impacts this data.

Student pre-survey Figure five is student responses to engagement level change upon returning to the classroom following a break. 46.4% reported somewhat, 14.3% responded markedly, 10.7% said not at all. Non-respondents impacted 26.6% of this data.

Student pre-survey Figure six asked students if they had difficulty reengaging when they returned from an independent break. 42.9% chose not at all, 21.4% chose somewhat, 7.1% chose markedly, Non-respondents impacted 28.6% of this data.

Student pre-survey Figure seven asked students if they thought a brain break would impact their ability to remain engaged and 46.4% reported somewhat, 14.3% chose not at all, 10.7% shared markedly. Non-respondents impacted 28.6% of this data.

Student post-survey Figure eight asked students if they found their ability to be fully engaged for the class period changed with the brain break, 73.1% responded markedly and 26.9% responded somewhat.

Student post-survey Figure nine asked if the students had difficulty reengaging following a brain break and 74.1% chose not at all, 18.5% chose somewhat, and 7.4% reported markedly.

Student post-survey Figure ten asked if the students found their peers would reengage following a brain break. 70.4% reported somewhat and 29.6% reported markedly.

Student post-survey Figure eleven asked student if their peers had difficulty reengaging following a brain break and 59.3% shared somewhat and 40.7% chose not at all.

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Student post-survey figure twelve asked if the amount of independent breaks requested were reduced following a brain break and 44.4% chose somewhat, 25.9% chose markedly, 22.2% chose not at all, and 7.4% chose somewhat.

#### **Question 5. Would a pre-scheduled five-minute daily break impact your ability to remain engaged during class?**

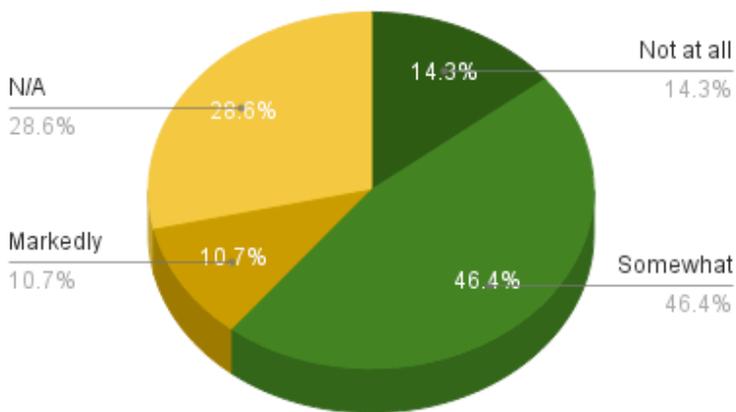


Figure 1

ENGAGEMENT IN SECONDARY EDUCATION THROUGH BRAIN BREAKS

**Question 1. Did you find your ability to be fully engaged for an eighty-minute class changed with a pre-scheduled brain break?**

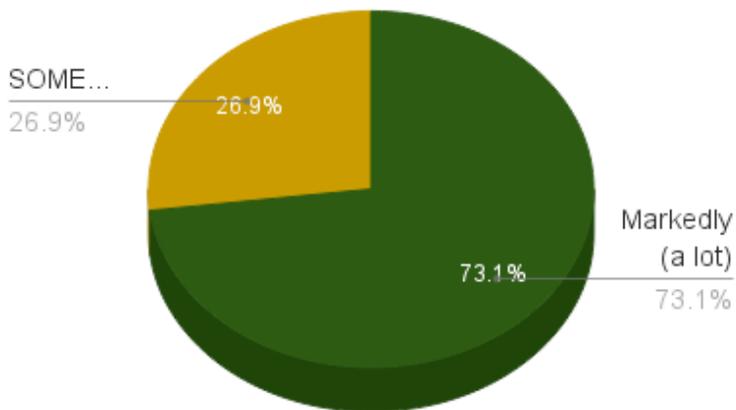


Figure 2

The student weekly comments were grouped into nine categories with the six larger traits being helpful, focused, engaged, process, relax, and movement. The student comments were counted each time the category was mentioned. Findings indicated that if given a five-minute break, a majority of students reported the breaks were helpful to them in their learning. Validation through the triangulation of data confirms that student responses, teacher weekly responses, and field observations consistently support that brain breaks can be helpful to the students as learners.

ENGAGEMENT IN SECONDARY EDUCATION THROUGH BRAIN BREAKS

**Student Responses to Pre-Survey:**

**Question 1: How often do you request an independent break during a class period?**

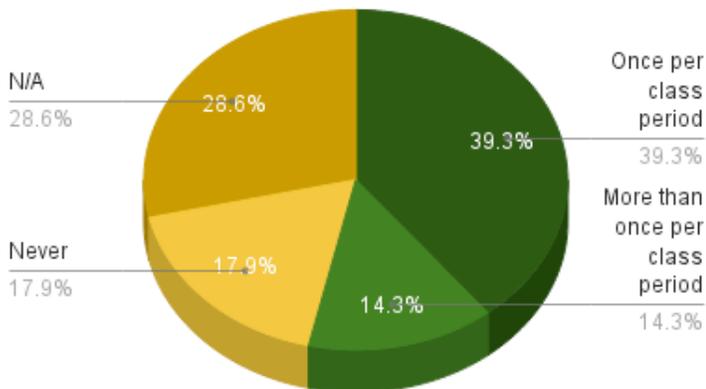


Figure 3

**Question 2. What do you do when you request an independent break?**

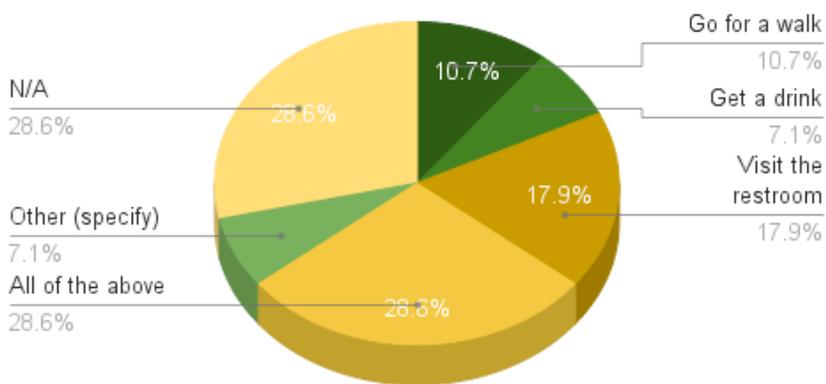


Figure 4

## ENGAGEMENT IN SECONDARY EDUCATION THROUGH BRAIN BREAKS

**Question 3. Do you find that your engagement level has changed when you return to class following a break?**

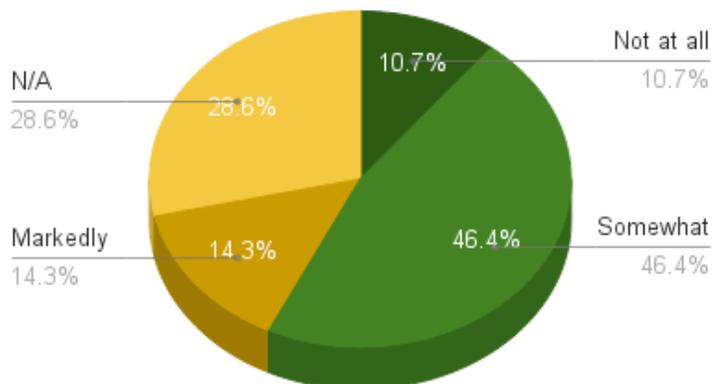


Figure 5

**Question 4. Do you find that you have difficulty re-engaging on the content when you return from an independent break?**

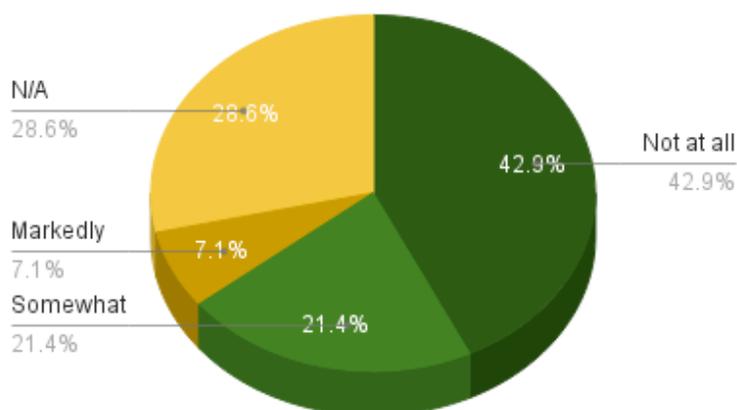


Figure 6

## ENGAGEMENT IN SECONDARY EDUCATION THROUGH BRAIN BREAKS

### Question 5. Would a pre-scheduled five-minute daily break impact your ability to remain engaged during class?

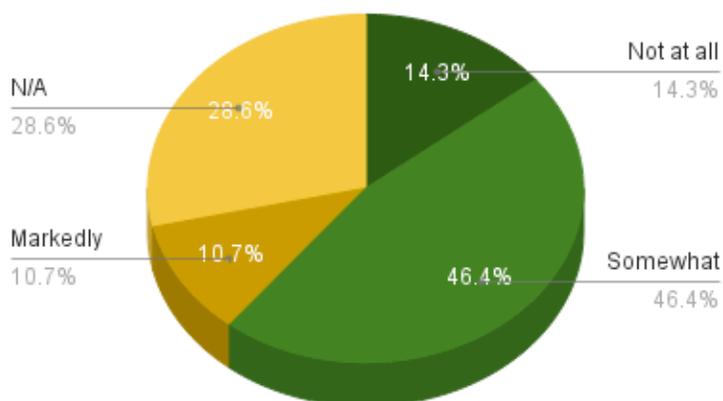


Figure 7

### Student Responses to Post-Survey:

#### Question 1. Did you find your ability to be fully engaged for an eighty-minute class changed with a pre-scheduled brain break?

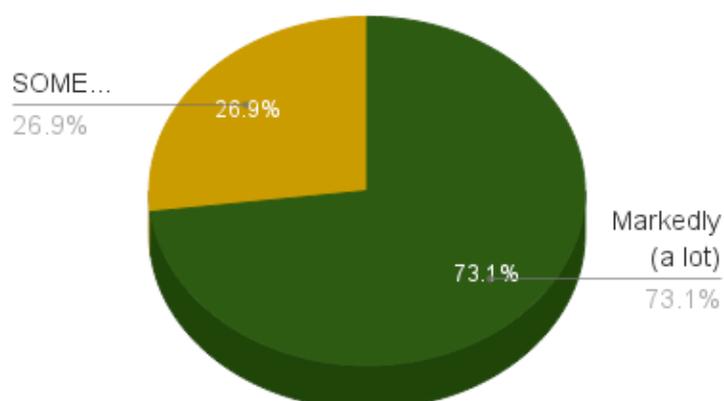


Figure 8

ENGAGEMENT IN SECONDARY EDUCATION THROUGH BRAIN BREAKS

**Question 2. Did you find difficulty reengaging in the classroom following a pre-scheduled brain break?**

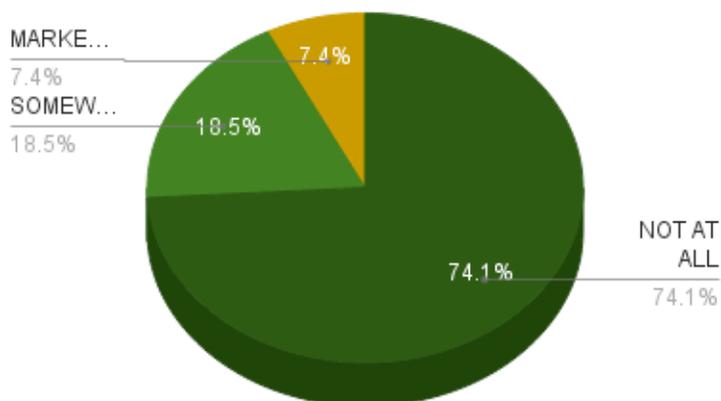


Figure 9

**Question 3. Did you find the other students would reengage following a brain break?**

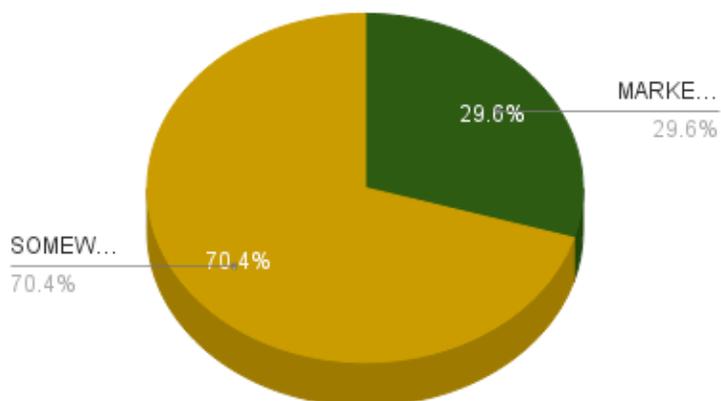


Figure 10

## ENGAGEMENT IN SECONDARY EDUCATION THROUGH BRAIN BREAKS

**Question 4. Did you find the other students had difficulty reengaging in the classroom following a brain break?**

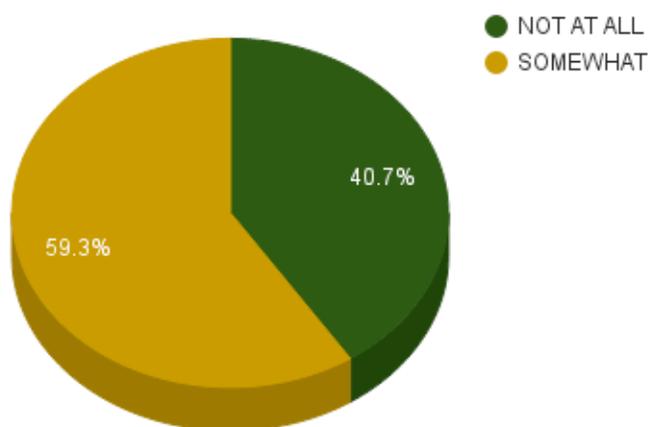


Figure 11

**Question 5. Did the amount of your requested independent brain breaks change? (when you ask to leave the classroom on your own)**

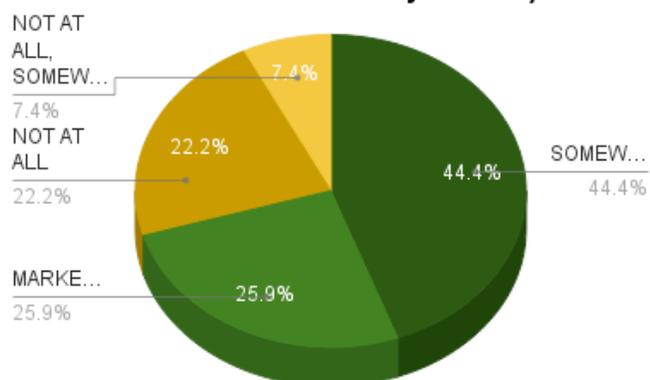


Figure 12

ENGAGEMENT IN SECONDARY EDUCATION THROUGH BRAIN BREAKS  
**Teacher Responses to Pre-Survey**

**Table 2**

1. Do you find your students to be fully engaged for an entire eighty-minute class?	2. How often is your teaching interrupted when your students request an independent break during class time?	3. Do you implement a student break at any point during your class?	4. Do you find the students reengage following a break?	5. Do you find the students have difficulty reengaging in the classroom following a break?	6. What impact does allowing for a break influence the effectiveness of your teaching?
Somewhat	Sometimes	Sometimes	Somewhat	Somewhat	Somewhat
Somewhat	Sometimes	Sometimes	Markedly	Not at all	Somewhat

In the teacher pre-survey, questions one, two, three and six are negated by similar responses. Questions four and five reveal a difference in responses in finding that students do re-engage following a brain break of somewhat and markedly and whether students have difficulty re-engaging following a brain break as somewhat and not at all. Following are teacher weekly responses recorded throughout the study. As one teacher noted, at times, the brain breaks are being implemented on a basis of need, rather than routine. My request was, that for the purpose of collecting data, we implement the breaks at the same time during each class period, forty minutes into the eighty-minute class. The teacher's' directives of their classroom schedule overrode my request. As one teacher noted, when the students are engaged in project-based learning or group activities, they are more likely to remain engaged and require a brain break less. I saw this in my own classroom observations as well. Students and teachers both noted a reduction in the amount of independent requests to leave the classroom before and after the brain breaks when they were scheduled and the students anticipated the break. Through classroom observations, I did notice that there were the chronic requests by a few particular students that appeared to have difficulty staying in the classroom on any given day at varied times throughout the class period, regardless of the implementation of a scheduled brain break (figure 5).

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**Teacher Weekly Responses:**

Table 3

<p>What were your observations as the classroom teacher this week in implementing a scheduled brain break for your students? Please elaborate through your detailed observations on student engagement levels, amount of independent requests for a break during class time, how the break is impacting the effectiveness of your teaching:</p>
<p>“Students (sophomores) were pleased to hear that I, too, was giving brain breaks. My initial observation is that this will proven a healthy departure. Students are respectful of this time. More data will become available as the brain break becomes part of the routine. Freshmen were already up and about this week so a brain break was not as necessary, as the students continued to work with one another in lieu of taking the break.”</p>
<p>“They seem to be effective, yet the timing needs to be more fluid and in tune with the lesson for continual effectiveness.”</p>
<p>“Less breaks are requested, nearly none, in fact. Since the brain break has become a part of the class's schedule, students remain more actively engaged who may not have so much in the recent past. I am still trying to work it into my plans effectively without allowing the allotted class time to suffer.”</p>
<p>“As we are making the break work with the class it is having a wonderful effect.”</p>
<p>“Timing is key, when you feel kids need that break. If you are aware and call it at the right time it provides ability to center, regroup, and come back strong.”</p>
<p>“I was looking forward to the break as much as some students were in the freshman class.”</p>

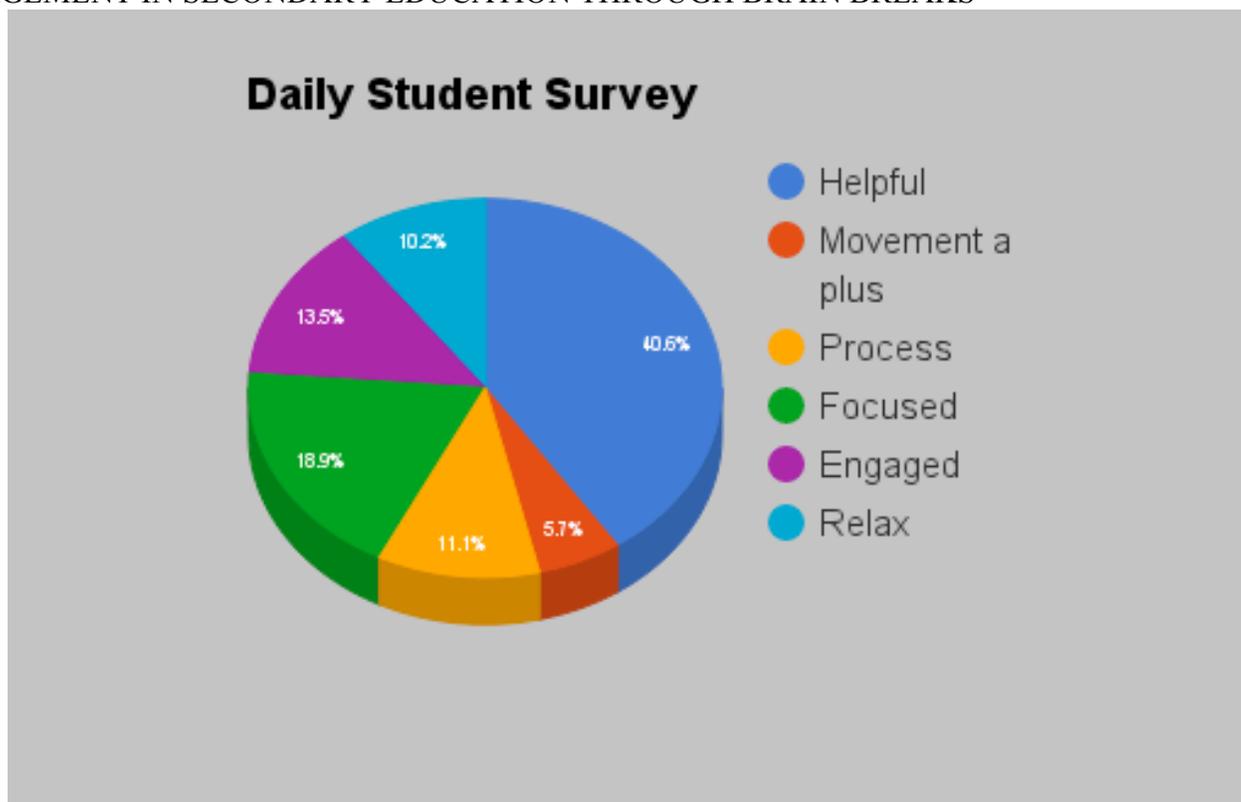
### ENGAGEMENT IN SECONDARY EDUCATION THROUGH BRAIN BREAKS

I switch gears 2-4 times during any given class and these have served as my "brain breaks" in the past. I have been errant in allowing the breaks consistently with the sophomores even though the breaks are part of my plans. I am a creature of habit.”
“They are wonderful because they allow kids the necessary break from the difficult task at hand and then an opportunity to engage with the work again refreshed.”
“Again the kids took advantage of it, took a necessary break and were able to reengage rejuvenated.”
“I am finding it very effective, the work is hard and the break provides the necessary respite before diving in again.”
“What I have observed is that my style of teaching doesn't show any marked necessity for a brain break. There have been times when it has been welcomed but most other times it has interrupted the overall flow of the class.”

### Conclusions

With consideration to the feedback of student perceptions through weekly evaluations, several of the student participants' indications led to the following themes: the breaks were described as *helpful*, student's were more *focused*, increasingly *engaged*, and many students described the breaks as a chance to *relax*, and the opportunity of *movement* was reported as beneficial.

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**Figure 13 Weekly Student Evaluations**

There were student reports of an inability to find any benefit in taking a brain break throughout the study. A small percentage of the students mentioned that the brain break was an opportunity to socialize and several added that they would prefer to continue with the breaks.

Teacher reports (figure 3) both support the students' findings and contradict these findings. One teacher reflecting on their own style of teaching, noted: "What I have observed is that my style of teaching doesn't show any marked necessity for a brain break. There have been times when it has been welcomed but most other times it has interrupted the overall flow of the class." This particular comment concerns me, because it is focused on the teaching and not the learning aspect of the mutual relationship between teacher and student. The teacher who

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remarked that student requests have decreased has helped to support the findings that brain breaks can be beneficial:

“Less breaks are requested, nearly none, in fact. Since the brain break has become a part of the class's schedule, students remain more actively engaged who may not have so much in the recent past. I am still trying to work it into my plans effectively without allowing the allotted class time to suffer.”

This comment also emphasizes the focus on “allotted class time,” which re-emphasizes the point that teachers find every class moment valuable, thereby making it difficult for them to relinquish five minutes to their students for brain breaks, they may view as beneficial to their teaching methodology.

### **Implications**

After experiencing a brain-break during an eighty-minute class, students reported a helpful change in their ability to focus and engage, and to process information received within the prior forty-minutes through the scheduled brain break, thereby meeting the expected findings. This study recommends that based on student and teacher input, teachers implement these breaks to ultimately increase student engagement.

Teachers can test the theory of the effectiveness of brain breaks through utilizing assessment prior to the implementation of brain breaks and then again post brain breaks. This would offer validation to the teacher of whether scores have improved following the use of brain breaks. Through this research project, the students have spoken and they shared the improvement in their focus, processing, and engagement in the classroom when brain breaks were implemented in the classroom.

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Involving an increased amount of teacher input would be beneficial in further research.

More consistent, full participation on all students' part would give a broader indication of student input.

The brain breaks taken by all students at the same time proved by my observations in the classroom to be more efficient and less disruptive. I also noted that when the breaks became routine, the students easily adapted to this newly introduced option with increased anticipation and smooth transition to and from the breaks.

The majority of students surveyed expressed that brain breaks were conducive to supporting their own engagement, as well as their peers' engagement in the classroom.

Recommendations are for teachers to implement a brain break during an eighty-minute class period to allow students movement to re-energize and re-engage.

With respect to other factors that influence student engagement, further research using teacher assessment pre and post-brain break to monitor engagement levels will inform teacher decision on the effectiveness of the breaks. Teachers can time students on their ability to refocus following a brain break. The findings of this study can be applied to other high school classrooms.

### **Final Reflection**

A recent interest in neuroscience first brought my attention to utilizing brain breaks in the secondary classroom. Neuroscientists recommend frequent rest periods for the brain and physical movement to increase oxygen flow to the brain to optimize learning. Brain breaks can be described as a physiological tool used by educators to increase student attention levels by

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allowing students to veer from the general learning environment for five minutes time, through some form of movement or relaxation technique.

This research project has been educational and enlightening, from the IRB proposal to making inferences about the collected data, and organizing the information into a final research paper. This study was intended to reveal a potential solution that involves education and directly impacts students. Choosing this particular study was not difficult, as I simply observed student behavior and its causes to make my determination. As I stated, I enjoy reading research on education and varied methodologies. Observation is a valuable tool in assessing student engagement, regardless of all of our combined knowledge as educators. This is reflected in Willingham's use of Leo Tolstoy's quote used in *Why Don't Students Like School?*

I know that most men, including those at ease with problems of the greatest complexity, can seldom accept the simplest and most obvious truth if it be such as would oblige them to admit the falsity of conclusions which they have profoundly taught to others, and which they have woven, thread by thread, into the fabrics of their life (p.121).

I wanted to participate in this research project while also attempting to make a valid contribution to serve the students in my district. Their involvement in the project drew me nearer to their experiences in the classroom and I became a sounding board. It was validating to have teachers who were not involved directly in the study provide additional feedback that they received from students in their classrooms. One teacher in particular told me of a student who got up to leave the classroom. When asked where he was going, this freshman informed the teacher that he was taking his brain break and would be back in five minutes. Another report from a teacher who was delivering a lecture she knew would need to be broken into two portions,

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part a and part b, she paused at the end of the first segment and told the students they could get up and move about for a few minutes to stretch. Several of the students responded to her that what she was offering them was a brain break. As this study was in progress, I noted that the students would often ask me beforehand when they would be given their brain break. My interpretation of their inquiry is that it was something to look forward to, a beacon to guide their decision making in whether to remain in the classroom until the moment arrived, or to leave at random to appease their senses, and that they were taking ownership of the breaks as a fundamental right. I too have had students I work with ask me if they can take a five-minute break, after the study ended.

There are varied means in which a brain break can be implemented: physical movement through exercises, relaxation through meditation, and playing five-minute mental games.

Following this research, implementing a scheduled brain break is recommended to high school teachers based on the student feedback. Time as a resource is precious. A student's ability to remain engaged is what makes all the time spent within the classroom worthwhile and if brain breaks enhance the learning experience, this is five minutes well spent.

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## ENGAGEMENT IN SECONDARY EDUCATION THROUGH BRAIN BREAKS

**Appendix****Appendix A****Letter to Superintendent**

Informed consent from superintendent

November 1, 2015

Dear Mr. McIntyre,

I am currently enrolled in the Masters of Leadership at University Maine at Farmington. As a capstone project, our cohort will be presenting data to faculty and guests. With your approval, I would like to survey two groups of students for a collection of data on the effects of brain breaks.

The students asked to participate in the project will have signed parental consent and sign their own consent to partake in the study. The students will have the option to withdraw at any time they so choose from participating. The research will be conducted in the general education classroom setting of the following content areas: English I, English II, World History, and U.S. History. The students will be the freshman and sophomore grade levels. I have consulted with the teachers of these courses and they have given their consent. The teachers are also willing to participate in the study from their own perspectives.

The data collected will be centered on integrating a three-minute break into the general education eighty-minute class period at the forty-minute mark. The students will be pre-surveyed, surveyed once a week, and the teachers will be pre-surveyed, surveyed once per week, and post-surveyed.

This is a confidential process and the student's identity will not be revealed and will not have any impact on student classroom participation scores. I have completed the National Institutes of Health (NIH) course on "Protecting Human Research Participants". I will store all data that is gathered for this purpose in a locked file cabinet or on my password protected school issued computer.

Thank you for your consideration of this request and feel free to contact me with any questions you may have concerning the project.

Sincerely,

Sheryl F. Morton

**ENGAGEMENT IN SECONDARY EDUCATION THROUGH BRAIN BREAKS**

I have reviewed Sheryl Morton's plan for researching the topic: Will the use of brain breaks implemented in the secondary classroom increase engagement? I give my consent to conduct this research from January of 2016 to May of 2016. I am aware that I can review the data and discuss the research project at any point during the research. I may also ask to view the report at the end of the study.

Date \_\_\_\_\_

Name \_\_\_\_\_

Position in district/site \_\_\_\_\_

## ENGAGEMENT IN SECONDARY EDUCATION THROUGH BRAIN BREAKS

**Appendix B****Letter to Principal**

Informed Consent for Principal

November 1, 2015

Dear Mr. Brown,

I am currently enrolled in the Masters of Leadership at University Maine at Farmington. As a capstone project, our cohort will be presenting data to faculty and guests. With your approval, I would like to survey two groups of high school students for a collection of data on the effects of brain breaks.

The students asked to participate in the project will have signed parental consent and sign their own consent to partake in the study. The students will have the option to withdraw at any time they so choose from participating. The research will be conducted in the general education classroom setting of the following content areas: English I, English II, World History, and U.S. History. The students will be the freshman and sophomore grade levels. I have consulted with the teachers of these courses and they have given their consent. The teachers are also willing to participate in the study from their own perspectives.

The data collected will be centered on integrating a three-minute break into the general education eighty-minute class period at the forty-minute mark. The students will be pre-surveyed, surveyed once a week, and post-surveyed. The teachers will be pre-surveyed, surveyed once per week, and post-surveyed.

This is a confidential process and the student's identity will not be revealed and will not have any impact on student classroom participation scores. I have completed the National Institutes of Health (NIH) course on "Protecting Human Research Participants". I will store all data that is gathered for this purpose in a locked file cabinet or on my password protected school issued computer.

Thank you for your consideration of this request and feel free to contact me with any questions you may have concerning the project.

Sincerely,

Sheryl F. Morton

## ENGAGEMENT IN SECONDARY EDUCATION THROUGH BRAIN BREAKS

I have reviewed Sheryl Morton's plan for researching the topic: Will the use of brain breaks implemented in the secondary classroom increase engagement? I give my consent to conduct this research from January of 2016 to May of 2016. I am aware that I can review the data and discuss the research project at any point during the research. I may also ask to view the report at the end of the study.

---

Date

---

Name

---

Position in district/site

ENGAGEMENT IN SECONDARY EDUCATION THROUGH BRAIN BREAKS  
**Appendix C**

**Parental Consent Form**

Dear Parents,

Your child is invited to voluntarily participate in a research project conducted by Sheryl F. Morton. I currently work as a RLRS high school special education teacher and am currently enrolled as a graduate student in the University of Maine Farmington. This study is on the impact brain breaks have on student engagement and processing in the general education, secondary classroom.

Your child will be asked to fill out a pre-survey, a brief weekly questionnaire, and a post-survey. These surveys and questionnaires will be the only additional time your child is asked to give. This survey does not impact your child's grade or require additional work.

The risk involved in this study is giving time to answer the surveys and questionnaires.

The benefits are in your child participating in a study that their voice is heard.

This is a confidential survey and absolutely none of your child's personal information will be distributed or your child's name used in the findings.

Participation is voluntary. If you choose to allow your child to participate in this study, she/he can withdraw at any time.

Parental signature: \_\_\_\_\_

Your printed name: \_\_\_\_\_

Date: \_\_\_\_\_

Printed Name of person obtaining consent: \_\_\_\_\_

Date: \_\_\_\_\_

ENGAGEMENT IN SECONDARY EDUCATION THROUGH BRAIN BREAKS  
**Appendix D**

**Written Child Assent Form**

**For ages 8-17**

I am planning a study in the high school classroom setting to see if a brain break improves student participation and learning new information from the teacher. This is a chance for you to use your student voice to share how your teacher changes your learning in the classroom.

If you choose to participate in this study, you will be asked to fill out a pre-survey, a short questionnaire once a week, followed by a post-survey. This study is only for a short period of time and the new information may be helpful to how well you do in the classroom.

You are allowed to ask any questions you may have during this study and can stop your participation at any time during the study.

You can decide whether you would like to participate or not participate in this study. If you decide to sign this assent form, it will mean you do agree to participate. You do not have to feel in any way that you must participate. This study is for those who want to take part.

Your signature below tells me that you have read the whole form and you are interested in participating in this study.

Your signature: \_\_\_\_\_

Date: \_\_\_\_\_

Your printed name: \_\_\_\_\_

Date: \_\_\_\_\_

Signature of person getting consent: \_\_\_\_\_

Date: \_\_\_\_\_

Printed Name of person getting consent: \_\_\_\_\_

Date: \_\_\_\_\_

## ENGAGEMENT IN SECONDARY EDUCATION THROUGH BRAIN BREAKS

### Appendix E

#### Written Adult Consent Form

#### For ages 18-older

I am conducting a study in the high school classroom setting to determine if a brain break improves student engagement and the ability to process transferred information from your teacher. This is an opportunity for you to provide your student voice to teacher effectiveness in your learning environment.

Should you choose to agree to partake in this study, you will be asked to fill out a pre-survey, a brief questionnaire once a week, followed by a post-survey. This is a short-term study and the information gained may be beneficial to your classroom experience.

You are permitted to ask any questions you may have during this study and have the ability to discontinue your participation at any time during the study.

You have the freewill to decide whether you would like to participate or decline participation in this study. If you decide to sign this assent form, it will mean you agree to participate. You do not have to feel in way that you are obligated to participate. This study is strictly voluntary.

Your signature below indicates that you have read the form in full and you are interested in participating in this study.

Your signature:

\_\_\_\_\_

Date \_\_\_\_\_

Your printed name:

\_\_\_\_\_ Date \_\_\_\_\_

Signature of person obtaining consent:

\_\_\_\_\_

Date \_\_\_\_\_

Printed Name of person obtaining consent:

\_\_\_\_\_ Date \_\_\_\_\_

ENGAGEMENT IN SECONDARY EDUCATION THROUGH BRAIN BREAKS  
**Appendix F**

**Written Teacher Consent Form**

With your permission, I would like to conduct a study in the high school classroom setting to determine if a brain break improves student engagement and the ability to process transferred information from your teacher. This is an opportunity for you to participate in a study of teacher effectiveness in your learning environment.

Should you choose to agree to partake in this study, you will be asked to fill out a pre-survey, a brief questionnaire once a week, followed by a post-survey at the end of the study. This is a short-term study and the information gained may be beneficial to your students' classroom experience.

You are permitted to ask any questions you may have during this study and have the ability to discontinue your participation at any time during the study.

You have the freewill to decide whether you would like to participate or decline participation in this study. If you decide to sign this assent form, it will mean you agree to participate. You do not have to feel in way that you are obligated to participate. This study is strictly voluntary.

Your signature below indicates that you have read the form in full and you are interested in participating in this study.

Your signature:

---

Date \_\_\_\_\_

Your printed name:

---

ENGAGEMENT IN SECONDARY EDUCATION THROUGH BRAIN BREAKS

Date \_\_\_\_\_

Signature of person obtaining consent:

\_\_\_\_\_

Date \_\_\_\_\_

Printed Name of person obtaining consent:

\_\_\_\_\_

Date \_\_\_\_\_

## ENGAGEMENT IN SECONDARY EDUCATION THROUGH BRAIN BREAKS

**Appendix G****Student Pre-Survey**

1. How often do you request an independent break during this class period?

Never  
 Once per class period  
 More than once per class period

2. What do you do when you request an independent break?

Go for a walk  
 Get a drink  
 Visit the restroom  
 All of the above  
 Other (specify) \_\_\_\_\_

3. Do you find that your engagement level has changed when you return to class following a break?

Not at all  
 Somewhat  
 Markedly

4. Do you find that you have difficulty refocusing on the content when you return from an independent break?

Not at all  
 Somewhat  
 Markedly

5. Would a pre-scheduled five-minute daily break for this class impact your ability to remain engaged during class?

Not at all  
 Somewhat  
 Markedly

## ENGAGEMENT IN SECONDARY EDUCATION THROUGH BRAIN BREAKS

**Appendix H****Teacher Pre-Survey:**

1. Do you find your students to be fully engaged for an entire eighty-minute class?  
 Not at all  
 Somewhat  
 Markedly
  
2. How often is your teaching interrupted when your students request an independent break during class time?  
 Never  
 Sometimes  
 Frequently  
 Always
  
3. Do you implement a student break at any point during your class?  
 Never  
 Sometimes  
 Frequently  
 Always
  
4. Do you find the students reengage following a break?  
 Not at all  
 Somewhat  
 Markedly
  
5. Do you find the students have difficulty reengaging in the classroom following a break?  
 Not at all  
 Somewhat  
 Markedly
  
6. What impact does allowing for a break impact the effectiveness of your teaching?  
 Not at all  
 Somewhat  
 Markedly

ENGAGEMENT IN SECONDARY EDUCATION THROUGH BRAIN BREAKS  
**Appendix I**

**Student Weekly Observations:**

Class Title: \_\_\_\_\_

Dates this class occurred this week:

\_\_\_\_\_

What were your observations as the classroom student this week in the implementation of a scheduled brain break in this class? Please elaborate through your detailed observations on your engagement levels, your peers engagement levels, and amount of independent requests for a break during class time:

**Appendix J**

**Teacher Weekly Observations**

Class Title: \_\_\_\_\_

Dates this class occurred this week:

\_\_\_\_\_

What were your observations as the classroom teacher this week in implementing a scheduled brain break for your students? Please elaborate through your detailed observations on student engagement levels, amount of independent requests for a break during class time, how the break is impacting the effectiveness of your teaching:

ENGAGEMENT IN SECONDARY EDUCATION THROUGH BRAIN BREAKS  
**Appendix K**

**Student Post-Survey**

1. Did you find your ability to be fully engaged for an eighty-minute class changed with a pre-scheduled brain break?

Not at all  
 Somewhat  
 Markedly

2. Do you find difficulty reengaging in the classroom following a pre-scheduled brain break?

Not at all  
 Somewhat  
 Markedly

3. Do you find the other students would reengage following a break?

Not at all  
 Somewhat  
 Markedly

4. Do you find the students have difficulty reengaging in the classroom following a break?

Not at all  
 Somewhat  
 Markedly

5. Did the amount of your requested independent breaks change?

Not at all  
 Somewhat  
 Markedly

ENGAGEMENT IN SECONDARY EDUCATION THROUGH BRAIN BREAKS  
**Appendix L**

**Teacher Post-Survey**

1. What type of change in student engagement following a brain break did you observe?

\_\_\_\_\_ Positive  
\_\_\_\_\_ Negative  
\_\_\_\_\_ No change

2. Did you notice a change in the amount of requested independent student breaks when a scheduled break was implemented?

\_\_\_\_\_ Not at all  
\_\_\_\_\_ Somewhat  
\_\_\_\_\_ Very much so

3. Did you find that scheduling a brain break had an impact on your ability to effectively teach?

\_\_\_\_\_ Not at all  
\_\_\_\_\_ Somewhat  
\_\_\_\_\_ Markedly

4. Would a scheduled brain break be something you would consider implementing in your classroom?

\_\_\_\_\_ Never  
\_\_\_\_\_ Sometimes  
\_\_\_\_\_ Always