7-2013

Emotional Disabilities: Students Have Difficulty Connecting With the World

Arleen Davis
University of Mary Washington

Emotional Disabilities: Students Have Difficulty Connecting With the World

Arleen Davis

EDCI 589 Applied Research

University of Mary Washington

Summer of 2014

I pledge on my honor that I have neither given nor received unauthorized aid on this assignment.

Arleen Davis

Table of Contents

Introduction

The education of children enhances and protects the outcome of the future. Some children are educated at home by their parents while others attend public or private schools, but what does the term educate mean? Merriam Webster defines educate as - *to provide schooling for*. This provides little understanding to a broad concept; however, subsequent entries begin to shed more light on the subject, such as *to train by formal instruction* and *supervised practice especially in a skill, trade, or profession*, followed by *to develop mentally, morally, or aesthetically by instruction*, and *to provide information*. Furthermore, synonyms include such words as *coach, mentor, direct, guide, lead*, and *rear*. As we move further from the dictionary's primary definition, we come closer to the concept of the role of education and the success of those on the threshold of tomorrow. Many educators and administrators hold fast to a structured environment providing new material and concepts to be memorized and reiterated as a measure of knowledge; however, the total person, physically, emotionally, and intellectually, must evolve through the years to become the greatest asset to the world we live in today. As each individual has different talents and skills, strengths and weaknesses, developing intrinsic recognition of these and capitalizing on them will increase motivation, competence, and productivity. As each student learns differently, each must be taught accordingly to be a critical thinker and effective problem solver.

Problem Statement

Theoretically, the purpose of education is to fulfill the cognitive potential through identification, investigation, analytical interpretation, collaboration, and utilization of innovative

ideas and new facts. The Individuals with Disability Education Act (IDEA) was created to assure that a free appropriate public education would be provided to all children with disabilities. As students have different obstacles to understanding and expressing information, special education services intend to provide specially designed instruction adapted to meet the unique needs of students with a disability and to meet the educational standards that apply to all students in the general curriculum. Unfortunately, students with emotional disabilities (ED) do not fit the mold for this treatment. By virtue of internal characteristics such as sleeping through class or external features of disorderly conduct, the students alienate themselves from administrators, teachers, and peers and do not become emotionally vested in interactive relationships for the cognitive exchange of information necessary for instruction. Without the appropriate establishment of trust in other people, ED students do not think anyone cares about them and continue to suffer the consequences of suspension as they fail to conform to uncomfortable social situations. With the highest drop-out rate, educators must mentor, guide, and cultivate students with ED in the development of the social skills necessary to interact appropriately to be successful academically, or lose them to an inaccessible world.

Rationale

As students with ED are not engaged in the traditional instructional routine because they are withdrawn or depressed and want to remain isolated or are aggressive with a lack of self-control and defiance, teachers need to realize that these behaviors are a manifestation of social inadequacies which need to be addressed in the classroom as a precursor to pedagogy. By integrating social skills into scholastic activities, teachers will develop positive and effective steps toward confidence and collaboration in education.

Research Questions

1. What behavior constitutes an emotional disability in a student?

2. How are students with emotional disabilities socially disconnected from the world around them?

3. How can social connections be improved?

4. How can teachers improve academic performance?

5. How do social skills influence postgraduate outcome?

Literature Review

The United States of America, land of freedom, home of the brave, with liberty and justice for all, provides a free public education to all children. Furthermore, the Individuals with Disabilities Education Act (IDEA) identifies 13 education disabilities that can be supported through special education services in the schools to increase the academic success of all students. However, the shocking reality that only 42% of students with emotional disturbance (ED) disabilities graduate from high school with standard diplomas is alarming. An even harsher statistic is that the ED students drop out of school at a rate of 51%, which is higher than students with any other disability (Cullinan and Sabornie, 2004; Lane, Carter, Pierson, and Glaeser, 2006).

These students with elevated drop-out rates also have less participation in postgraduate education, little community involvement, a higher level of unemployment and underemployment, and a greater incidence of incarceration. Transition to adult life is difficult for ED individuals with decreased academic performance and skill and debilitating social inadequacies (Cullinan and Sabornie, 2004; Lane et al., 2006; Solar, 2011). What characterizes the ED disability and why is it so devastating to a student's success? How can today's teachers make a positive difference in connecting with these students to bring them into the world around them and open the doors to achievement and opportunity?

Identification of Emotionally Disabled Students

Emotional and Behavioral Disorders (EBD) involve a long term condition that influences an adolescent's perception of the world around him. This encompasses much more than being a response to stressful situations. The Virginia Department of Education reports that the term

emotional disturbance or disability is commonly used interchangeably with behavioral disorder. The federal and state regulations define ED as a condition exhibiting one or more of the following characteristics:

- An inability to learn which cannot be explained by intellectual, sensory, or health factors

- An inability to build or maintain satisfactory interpersonal relationships with peers and teachers

- Inappropriate types of behavior or feelings under normal circumstances

- A general pervasive mood of unhappiness or depression

- A tendency to develop physical symptoms or fears associated with personal or school problems

In determining whether students have ED, a multidisciplinary team must determine if the behavior has existed over a long period of time, not just on occasion or for a short period of time; and to a marked degree that interferes with their learning (Cullinan and Sabornie, 2004; Solar, 2011;Van Acker, n.d.). While these behaviors can arise in most of the population at some stressful time, it is the degree that the behavior occurs that suggests an emotional disorder. This subjective perception is not based on clear definitions and many students are not identified with the disability.

Categories of emotional disabilities. Students with the same label of ED can have very different characteristics; each case is unique. The two basic categories of ED symptoms include externalizing behavior and internalizing behavior.

Students with externalizing behavior affect others around them. They display aggression, defiance, disobedience, lack of self-control, and may participate in lying and stealing. ED can also be manifested as hyperactivity, impulsiveness, short attention span, aggressively acting out verbally or physically fighting (Bursztyn, 2011; Cullinan and Sabornie, 2004). These students are more readily identified by teachers as they disrupt the classroom and are more likely to be referred for services.

Students with internalizing behaviors are personally affected by resulting anxiety, depression, eating disorders, social withdrawal, and suicide (Cullinan and Sabornie, 2004). Students with ED do not initiate conversation; they tend to retreat from impending social situations because of anxiety and fear of the outcome from the interaction (Bursztyn, 2011). This resistance to social situations is also reflected in the student's lack of participation in school or community activities (Lane et al., 2006).

Symptomatology. Adolescents with ED characteristically have problems with interpersonal relationships, inappropriate responses to normal situations, unhappiness, depression, anxiety, physical symptoms or pain associated with school difficulties, fear of personal problems, fear of school troubles, unexplained inability to learn, withdrawal from social interactions, and extensive aggressiveness (Certo, Cauley, and Chafin, 2003;Van Acker, n.d.). Students with ED may be searching for the deeper meaning to questions as they have been through tougher emotional situations and question life while they are trying to establish their identity during adolescence (Solar, 2011). Such adolescents do not have mature coping skills and may cry easily or, in contrast, lose their temper and explode (Bursztyn, 2011).

Comorbidity of Disabilities. There is frequent comorbidity of ED with learning disabilities, other health impairments such as attention deficit disorder and attention deficit

hyperactivity disorder, anxiety disorder and mood disorder (Lane et al., 2006; Van Acker, n.d.). Students with emotional disabilities have a higher rate of dropping out of high school and a lower incidence of participation in postgraduate education (Lane et al., 2006).

Causes. There is no specific identifiable cause of ED; it can result from a physiological origin such as a brain disorder or genetic characteristic. Emotional disabilities can also arise from a poor diet, inappropriate family functioning, life experiences, and excessive stress (Solar, 2011).

Behavior and Achievement in the Classroom

Students with ED lack social skills for conversation and do not emotionally connect with other people. They do not realize how others perceive them, and conversely, do not see how their own behavior affects other people. An ED student in class repeatedly insults his classmates and does not realize he is acting inappropriately. He does not see that the other student is affected by his negativity. ED students do not delay fulfilling their own goals in response to the objectives of the class that is presently going on. There is a conflict between the student's ability to comply and the teachers' expectations for student compliance (Bursztyn, 2011; Cullinan and Sabornie, 2004).

Discipline. The punitive cycle in schools where no tolerance policies target defiant behavior and deliver punishment characteristically causes further resistance from the behaviorally disadvantaged students and consequent increased punishment from the school. Disciplinary suspensions also remove students from school isolating them to a greater extent. This creates a sense of hopelessness in ED students by reinforcing the concept that teachers do not care about them on a personal or academic level. This perception leads to withdrawal from

school and classroom participation with 40-60% of secondary school students disengaged from school (Allman and Slate, 2013; Bursztyn, 2011).

The punishment for inappropriate behavior is a form of external motivation. It does not increase the emotional welfare of the ED student; therefore, it does not bring about any positive change in the behavior. Students with emotional disorders are suspended from public schools more than students with any other disability or students without disabilities. Furthermore, ED students who had been removed from the school environment had significantly lower scores on TAKS math and TAKS reading standardized tests than similar students who had not been suspended (Allman and Slate, 2013). Inappropriate discipline is not effective in positively changing behavior or academic skills. Rather than being a controlling teacher, a patient and caring mediator can bring students to a nurtured emotional field to accept the educational challenge with creativity. Students are internally motivated and need to be involved in choosing their behavior. They need to realize that their contribution will make a difference if they participate (Certo et al., 2003).

Academic performance. There is a strong correlation between a student's emotional health and his performance in school. The emotional responses of individuals with ED are not characteristic of age appropriate, ethnic, or cultural norms, and negatively affect the person's self-care, social relationships, regulation of self in classroom behavior, and work adjustment which ultimately decreases their academic progress (Van Acker, n.d.). Emotional well-being helps students adjust to changes, solve problems, deal with stress, and possess a good self-image with an ability to care for others and offer help (Li and Lerner, 2013). Longitudinal studies have shown that students who felt cared for by their schools had less substance abuse, violence, pregnancies, and turmoil (Bursztyn, 2011; Certo et al., 2003; Li and Lerner, 2013).

Emotional Connections with the World

Social and emotional competence is the core for educational success. The Collaborative for Academic, Social, and Emotional Learning (CASEL) at the University of Illinois in Chicago suggested the areas of need for students were social awareness, self-awareness, self-management, relationship skills, and responsible decision making. Students need to be able to empathize and show compassion to create a community, be able to realize their strengths, accept responsibility, work toward a goal and work collaboratively (Bursztyn, 2011; Li and Lerner, 2013). Components of William Glaser's Choice Theory describe the innate needs to be loved and connected to others, possess competence and ability, have a level of autonomy and freedom, and to have fun. When these needs cannot be met, people will misbehave. This implies that schools should create learning environments that will satisfy these requirements to increase success (Bursztyn, 2011; Certo et al., 2003; Li and Lerner, 2013; Solar, 2011). Similarly, people require these needs to be met to interact effectively in the world around them, to participate socially in the community, and work collaboratively in employment milieus.

Understanding the Student's Perspective

When an ED student was questioned by counselors about school, he replied that no one cared about him or respected him, that things do not get better, and that a point system for rewards he does not want will not change the way he is. Another student at the same school who characteristically kept his head down during classes only responded that he did not care. While each student had very different characteristics of ED, neither child was motivated to improve his social or academic status. Children with emotional and behavioral challenges require improvement in socially responsible behavior. Such students do not have an extensive repertoire of behavior choices instilled in them to deal with social situations and often respond

inappropriately (Bursztyn, 2011; Solar, 2011). Caring teachers and administrators need to model

good behavior and show a personal interest in the ED students' lives. Teachers can display

pictures of their families, home, and activities to elicit questions from students that will initiate

sharing personal information and establishing trust (Solar, 2011). Students also learn from other

students by expressing and sharing ideas which provide alternate views that can change the way

one thinks. Other students' stories are emotionally based and students see similarities to their

own lives and make personal connections. This type of interaction builds trust among the

students. Sharing information is the first step in risk taking for students with ED. Addressing

emotion in the classroom allows students to be more reflective and practical. Students will make

decisions on what choice is best with greater insight as they recall previous learning and

discussion (Fitzsimmons and Lanphar, 2011; Li and Lerner, 2013).

Creating Emotional Connections

Studies of middle school students at San Roque School, Santa Barbara, California

uncovered pertinent data through interviews, classroom observations, student journals and end of

the year student reflections. Researchers concluded that students felt the motivation in the

classroom was powered by love (Fitzsimmons and Lanphar, 2011). Emotional engagement plays

a significant role in the learning process by creating a safe zone where each student's thoughts

have value in contributing to a greater understanding. Students voicing their opinions and

sharing their emotions lead to a sense of community as they are no longer alone with their

feelings. Students become competent in their ability to express their understandings and needs

and exchange ideas with their peers. The teacher needs to balance the positive and negative

reactions to bring resolution as students begin to divulge their emotions with consequent

reactions by classmates. By analyzing emotions, students gain a greater understanding through

personal reflection and empathy to better handle conflicts by weighing different options and accepting social interaction (Certo et al., 2003; Fitzsimmons and Lanphar, 2011; Li and Lerner, 2013; Solar, 2011).

In the 4-H Study of Positive Youth Development, high school students were followed from ninth grade through eleventh grade to examine the interrelationships of behavioral, emotional, and cognitive engagement. The study determined that cognitive engagement is greatly affected by a student's behavioral and emotional engagement. Children who like school are more inclined to participate and those who participate in extracurricular sports, clubs, and social activities are more successful academically. These students try harder than those who remain isolated in the school (Li and Lerner, 2013). It is crucial to encourage a nurturing environment in the school so that students will be emotionally attached to the educators and the curriculum. When students feel that they belong to their school, they are motivated to participate and take ownership of their learning. The extent that students feel they belong is directly related to the relationships they have with their teachers. Students that communicate their personal opinions begin to realize that others take an interest in what they think and show concern (Certo et al., 2003; Fitzsimmons and Lanphar, 2011; Solar, 2011).

Creating Instructional Connections

Problems in society are typically solved by people working together and discussing options; however, students are customarily expected to find the answers to questions in the classroom on their own. When students collaborate by discussing their previous knowledge, reflections, insights, and values to bring all the information together through negotiation, they are practicing transformative learning to solve their problems.

Authentic learning pedagogy. Research indicates that authentic learning positively influences belonging and engagement. Authentic learning has been described by Marks as instruction connected to the world beyond the classroom. According to Marks' (2000) research of urban high school students, supportive teachers and authentic instruction elicited increased student engagement. Similarly, interviewed high school students from the suburban upper-Midwest, in 1996, revealed that authentic curriculum that was pertinent to the students' current and future lives, along with projects, interactive lessons, and small group discussions, resulted in enhanced engagement. Furthermore, collaboration and decision making by the students had a significant influence on their involvement (Certo et al., 2003; Doering, 2006). Authentic learning incorporates personalized, real-world tasks that are relevant to the facts students care about. Schools need to provide activities that emphasize individual learning. Emotional attachment to issues and classmates make students personally involved in what matters in real world activities (Certo et al., 2003; Doering, 2006; Fitzsimmons and Lanphar, 2011). Classroom emotions and behaviors, including boredom and happiness, influence the possible outcome of the task presented. A teacher who supports the students' psychological needs by providing a rationale for why a lesson is valuable and pertinent to their lives increases their internal motivation and resultant engagement in the activity. Allowing students to choose which medium they use to present their work also increases engagement as students are able to exercise their right to have freedom of choice. Students need to gain confidence in their own capabilities. Self-efficacy determines how much effort and perseverance a student will use on a difficult task as well as raise the expectation of how well he/she will do. If a student has low self-efficacy and lacks confidence, he/she will set the bar low, not expecting to do well, and will not put forth as

much effort (Certo et al., 2003; Fitzsimmons and Lanphar, 2011; MIH and MIH, 2013; Pittaway,

2012; Siegle, Rubenstein, and Mitchell, 2014).

At an international conference on Authentic Learning, August 2010, the keynote speaker,

Alfie Kohn, asked the audience what their students would remember after ten years. After

subsequent discussion and reflection of members of the audience, it was decided that the answer

to this question is usually related to an emotional attachment or a separation. Emotional

attachment creates the longest lasting memories, yet emotion has been traditionally suppressed in

the classroom (Fitzsimmons and Lanphar, 2011). Emotion creates a firm connection to memory.

This revelation should influence an emotionally driven approach to education. Engagement is

necessary for student success and meaningful instruction. Teachers must be engaged to

incorporate new information into the world the students live in and understand. Personal

engagement, academic engagement, intellectual engagement, social engagement, and

professional engagement are interrelated in effecting a positive learning outcome. Educators

who promote learning over a time continuum support a growth view of intelligence where all

people are able to learn rather than employing an immediate pass or fail approach that generates

feelings of inadequacy and incapability in students (Certo et al., 2003; Fitzsimmons and Lanphar,

2011; Pittaway, 2012).

Student choice. Research conducted by interviewing 33 students from seven public high

schools in Richmond, Virginia with open-ended questions, resulted in a student preference for

authentic learning with hands-on activities and group discussions and debate. The students

wanted the teachers to care about them, care about their grades, and offer help when it was

needed. The students also wanted variety in the classroom. They did not prefer note taking and

worksheets that prevented student discussion (Certo et al., 2003; Doering, 2006; Moos and Honkomp, 2011).

Examples of authentic instruction. The goal for an authentic approach in a General Educational Development (GED) class is to build a classroom community with the trust that students need to interact. Creating learning experiences by using events that are important to the students enables them to realize they have something important to say; they have a vital role in using their acquired knowledge toward a goal. A teacher can get a class interested in a topic of instruction by having the students tell personal stories relevant to the subject and follow with applause from the listening class. The result is twofold as students feel they have something worthwhile to share while gaining trust in their peers, and, concurrently, inform the teacher through these disclosures the information that is authentic to their lives. An example of discussing topics before beginning an exercise on the mechanics of writing provides positive reinforcement of ideas and acceptance of student's emotions. Once a comfort zone is achieved, students are more interested in participating and pursuing deeper meaning. Having the class listen to each student and acknowledge the story that is told will build confidence and motivation prior to constructing the essays (Certo et al., 2003; Siegel, 2007).

'Our Year In Review' is another example of an authentic exercise used in the GED class. Students brought in magazine articles, newspaper clippings, and information from websites on events that were important to them during the year and made a visual display while the teacher stressed summarizing skills and data citations from the instructional aspect. This was the springboard for groups to select ten of the events and create a presentation in any medium they chose to support the events' significance. The group members were personally involved in the topic before work on the assignment began, thereby increasing engagement (Siegel, 2007).

If a student values the information or skill to be learned, he/she will be increasingly motivated to engage in learning. Unfortunately, by the time many students get to high school, they have internalized all the disapproving comments about underachievement from teachers, parents, and peers and have little faith in their ability. Cooperative work and support from teachers improve student empowerment and confidence to learn regardless of previous experiences that may have had negative implications (Certo et al., 2003; MIH and MIH, 2013).

An objective of authentic learning is to generate creative and critical thinkers, problem solvers, and collaborators through applied learning in conjunction with technology in a multimedia and web learning environment (MWLE). Apple's authentic Classroom of Tomorrow (ACOT2) is based on six principles:

1. Understand 21st Century skills

2. Target relevant and applied curriculum

3. Use informative assessments

4. Utilize innovation and creativity

5. Elicit social and emotional connections with students

6. Provide technology

Apple recommends permitting students to choose the curriculum application, utilizing activities authentic to the students, and using technology when creating an authentic learning environment (Neo, Neo, and Tan, 2012). Research inquiries through multimedia sources can reveal diverse formats from varying perspectives, enriching understanding and personal interpretation of new information. Moreover, technology allows greater collaboration with students near and far as well as with field experts through social networking.

Realizing problems and working with others to find the solution strengthens collaboration and communication skills in authentic learning settings. Students discover that answers can be obtained by hearing different perceptions of the situation from several coworkers rather than relying on the perspective of only one person (Neo et al., 2012; Yoon and Hyun, 2012).

Authentic learning can be categorized as part of the Constructivist Theory because students construct their knowledge through problem solving cognitive activities. Educators of high school biology majors in Israel believed that science students should be immersed in the scientific community to gain understanding of scientific practices. They created an authentic task of locating the specific gene responsible for hearing loss with the support of bioinformatics research databases. The students gained deeper meaning to their previous classroom instruction on genetics by utilizing the tools scientists use. Tackling a genetic problem enabled the students to apply their knowledge, discuss results and form explanations. Some of the teachers in the school thought using this inquiry was valuable as a follow-up to the genetics instruction while other teachers felt it was more appropriate to use as extra support during the initial genetics unit (Gelbart and Yarden, 2006; Neo et al., 2012).

Future occupations. Instructing through the authentic learning pedagogy gives students the opportunity to develop knowledge in a professional field of interest. When setting up authentic work environments, teachers need to be cognizant of the strengths and talents of the students to foster engagement in their responsibilities and build confidence. Students can develop job skills in a desired profession through the real-world activities (Neo et al., 2012; Yoon and Hyun, 2012). The teacher's involvement in the project also strengthens the connection with the students and their sense of belonging and contributing, further enhancing academic success and postgraduate outcome.

Adventure learning curriculum. A hybrid of authentic learning based on real-time distance education addressing real-world situations describes adventure learning. Rather than instruction taking place in a traditional classroom setting, adventure learning incorporates a collaboration setting of students, teachers, and experts in the field from different locations that interact via the internet. Through dialogue with various people to share ideas and information, students gain insight and find solutions. Real-time learning environments allow students to engage in communication and collaboration on a continual supportive basis. Prior knowledge leads to inquiry, reflections, and opinions as the students interact with the people in the field and those tuning in from various distant locations (Doering, 2006; Moos and Honkomp, 2011).

The foundation of adventure learning is built upon seven basic principles which are reflected in the Arctic Transect 2004: An Educational Exploration of Nunavut (AT 2004) online learning environment.

1. A problem solving research curriculum must correspond with the field activities with pre-established learning outcomes. The AT 2004 developers created a curriculum document with learning outcomes divided into units with guiding questions to engage the students in coming to conclusions. Their online classroom was secure with user id and password requirements.

2. Communication and teamwork among students, peers, and experts in the field is vital to adventure learning collaboration. In AT 2004, a Collaboration Zone was the environment where interactive communication took place between students and teachers, students and students, students and subject matter experts, teachers and subject matter experts, and teachers and teachers.

3. Access to the internet to provide the learning environment is necessary to bring the class into the various field activities, videos, interviews, and excerpts. Frequent updates on events and opportunities for interaction are achieved through this access. Teachers can also use the internet for professional development on adventure learning programs.

4. Timely media and transcripts from the field to supplement curriculum motivate students as the authentic real-time events are changing and need to be added as new knowledge.

5. Learning opportunities align with the adventure learning curriculum by providing media, activities, and resources to support the particular unit material. In AT2004, the water unit was supported by reports, photos, and movies on the amount of water used by explorers, how the Inuit people obtain water from the Arctic, and weather influences. Students also participated in local activities such as measuring water usage in their own homes to add to the collaboration field of knowledge.

6. The curriculum and online environment must follow the guidelines of the pedagogy; these can be coordinated with the use of teacher tutorials such as those in the curriculum guide to AT 2004.

7. The adventure based nature of this pedagogy is what captivates students' interest as they personally relate to other students experiencing a life different from their own. In AT 2004, the internet provided video time with an Inuktitut class discussing learning their native language, meeting people and having fun (Doering, 2006). For ED students hesitant to reach out to other people, they can learn from the conversation of others and not feel threatened in their personal space.

Adventure Learning incorporates real-world situations into a student driven quest for knowledge by using websites with applications of actual events. Students work collaboratively to identify and analyze in a problem solving lesson. This approach allows students to go places beyond their geographical location and see different cultures and societies (Doering, 2006; Moos and Honkomp, 2011).

Emotional encouragement. Adventure learning allows students to understand the world. They see places they might not be able to travel to and learn how others survive and flourish in different circumstances. Real-time locations pique a student's curiosity as they enter into an unknown setting and observe. Witnessing successes and failures in other environments demonstrates the trials and tribulations of people everywhere. It is reinforcing to watch dissimilar people survive atypical challenges while having the same fundamental emotional human needs. For a student with emotional disabilities, there is comfort in realizing that there are alternate views of living arrangements, jobs, food sources, communities and interaction. The more diversity one sees, the more possibilities for adaptation are understood. This broadens their horizons to think beyond the sheltered environment the student may have felt trapped in or hid from society in. New ideas cultivate aspirations. Knowledge can be transferred to similar situations in students' personal lives in the homeland. Extraordinary concepts inspire conversation and social interaction which develops confidence and creative thinking. The more you become aware of, the more you will want to discover. Even using the internet as an escape from one's surroundings adds knowledge for greater perspective. It is difficult to choose what to do with one's life when the possibilities have never been realized (Doering, 2006; Solar, 2011).

Academic service-learning. A third enlightening approach to educating students with emotional disabilities is Academic Service-Learning (AS-L) with involvement in the community.

A study over the course of a semester determined that students had increased motivation and enjoyment when they were helping other people and formed relationships with these same people in the community. This exercise not only elaborated on real-world applications but intertwined the social responsibility and human emotional concept. Interestingly, when students experienced distracting issues such as transportation difficulties or insufficient time, there was less communication with the people involved in the project and the students did not develop the personal responsibility of being integral to helping the cause. The empowerment of making a difference in someone's life is a strong motivational force for students to fulfill responsibilities in any setting, educational or social (Darby, Longmire-Avital, Chenault, and Haglund, 2013).

Transition to Employment

The Individuals with Disabilities Education Improvement Act of 2004 seeks to have schools improve the transition of students with disabilities for greater post-school outcome (VDOE). Students with ED need to learn how to interact with other students to gain trust and confidence in social settings to prepare for future employment (Bursztyn, 2011; Certo et al., 2003; Fitzsimmons and Lanphar, 2011; Li and Lerner, 2013; Solar, 2011). 400 Human Resource Professionals questioned by Casner-Lotto and Barrington in 2006, rated professionalism/work ethic, teamwork/collaboration, and ethics/social responsibility as three of the five most important skills for success in this century (Bursztyn, 2011).

Students with ED have deficits in academic, social, and behavioral skills which impede transition from high school to independent adult life (Lane et al., 2006). Emotionally and behaviorally disadvantaged students through personal attachments to teachers and peers, increase their trust and respect for people, learn from others obtaining a broader view of the world, and

gain the self-confidence to work together successfully to enhance their own pursuits as well as to help others.

Conclusions

Students with ED are followed in school by the Special Education Department with an Individual Education Plan (IEP) to provide accommodations and differentiated instruction to improve their academic performance. The reality of the situation is that first and foremost, the emotional capability of the student must be understood through a personal and meaningful relationship with the responsible educators and those inadequacies must be improved with appropriate social interactions modeled and nurtured to attain a more reflective student with greater insight and autonomy to collaborate and problem solve. As the ability to share information becomes reciprocal, the student learns to interact effectively with others. By utilizing transformative pedagogies which incorporate authentic learning into an interactive curriculum, the teacher makes the lessons personally and emotionally related to the student's life. This emotional attachment increases engagement in the activity and increases memory retention and academic performance. Authentic instruction allows any student, regardless of monetary or family restraints, employment or responsibilities, to experience a world they would otherwise never realize and broaden the possibilities for greater postgraduate outcome

Applications Introduction

Students with emotional disabilities need to be brought into a personal world of

interaction by sharing their thoughts with a compassionate and interested audience to establish

trust and foster participation. Teachers also need to engage the students socially in the school,

greeting them by name outside of the classroom and taking an interest in how they are doing.

Until ED students think that someone truly cares about them on a personal level, they will not

jeopardize the safety of isolation. Teachers must model appropriate responses to ideas expressed

by students for the class to replicate for a supportive interactive discussion. ED students need to

have a safe haven for baring their souls that will build their confidence and call them out to have

a voice. Teachers must strive to create a community classroom by soliciting events that are

important to students to open discussion where students' views and opinions receive teacher and

peer support. As students increase their participation, they will begin to realize their

contributions influence the outcome as they search for understanding of newly presented

information and its relationship to the world around them. The curriculum should be

orchestrated around group activities, observations and discussions with recognition of input to

encourage students to be involved. When work is accomplished through joint endeavors,

students will embrace sharing the work while developing improved social skills. Aligning

authentic activities with the course standards will get the students involved in real-life situations

with genuine issues that need answers, making it purposeful work they have a vested interest in,

while still covering the necessary material. This venture will improve collaboration skills and a

work ethic crucial to successful employment in the future.

On the following pages of applications, there is an authentic lesson plan on DNA

fingerprinting, a list of learning adventures to explore and consider that will take students to

interactive roles with people all over the world, and an in-depth overview of Jason Learning to

elucidate the awareness and diversity of such transformative pedagogies.

References

Allman, K. L., & Slate, J. R. (2013). Disciplinary Consequences Assigned to Students With

    Emotional Disorder, Learning Disability, or Other Health Impairment: Effects on Their

    Academic Achievement. *Journal Of Education Research*, *7*(1), 83-101.

Bursztyn, A. (2011). *Childhood Psychological Disorders : Current Controversies*. Santa

    Barbara, Calif: Praeger

Certo, J. L., Cauley, K. M., & Chafin, C. (2003). Students' perspectives on their high school

    experience. *Adolescence*, *38*(152), 705-724

Cullinan, D., & Sabornie, E. J. (2004). Characteristics of Emotional Disturbance in Middle and

    High School Students. *Journal Of Emotional & Behavioral Disorders*, *12*(3), 157-167.

Darby, A., Longmire-Avital, B., Chenault, J., & Haglund, M. (2013). Students' Motivation in

    Academic Service – Learning Over the Course of the Semester. *College Student Journal*,

    47 (1). 185-191.

Doering, A. (2006). Adventure Learning: Transformative hybrid online education. *Distance

    Education*, *27*(2), 197-215. doi:10.1080/01587910600789571

Fitzsimmons, P., & Lanphar, E. (2011). 'When There's Love Inside There's a Reason Why':

    Emotion as the Core of Authentic Learning in One Middle School Classroom. *Literacy

    Learning: The Middle Years*, *19*(2), 35-40.

Gelbart, H., & Yarden, A. (2006). Learning genetics through an authentic research simulation in

    bioinformatics. *Journal Of Biological Education (Society Of Biology)*, *40*(3), 107-112

Lane, K. L., Carter, W. W., Pierson, M. R., & Glaeser, B. C. (2006). Academic, Social, and Behavioral Characteristics of High School Students With Emotional Disturbances or Learning Disabilities. *Journal Of Emotional & Behavioral Disorders*, *14*(2), 108-117.

Li, Y., & Lerner, R. M. (2013) Interrelations of Behavioral, Emotional, and Cognitive School Engagement in High School Students. *Journal of Youth And Adolescence*, 1/2 (1), 20-32.

MIH, V., & MIH, C. (2013). Perceived Autonomy – Supportive Teaching, Academic Self-Perceptions and Engagement in Learning: Toward A Process Model of Academic Achievement. *Cognitie, Crier, Comportament/Cognition, Brain, Behavior*, 27 (4), 289-313.

Moos, D. C., & Honkomp, B. (2011). Adventure Learning: Motivating Students in a Minnesota Middle School. *Journal of Research On Technology in Education*, 43 (3), 231-252.

Neo, M., Neo, K., & Tan, H. (2012). Applying Authentic Learning Strategies in a Multimedia and Web Learning Environment (MWLE): Malaysian Students' Perspective. *Turkish Online Journal Of Educational Technology - TOJET*, *11*(3), 50-60.

Pittaway, S. M. (2012). Student and Staff Engagement: Developing an Engagement Framework in a Faculty of Education. *Australian Journal of Teacher Education*, 37 (4), 37-45.

Siegel, J. (2007). Keeping It Real: Using Authentic Materials in a GED Class. *Adult Basic Education & Literacy Journal*, *1*(2), 100-102

Siegle, D., Rubenstein, L., & Mitchell, M. S. (2014). Honor Students' Perceptions of Their High School Experiences: The Influence of Teachers on Student Motivation. *Gifted Child Quarterly*, 58 (1), 35-50. Doi:10, 1177/0016986213513496

Solar, E. (2011). Prove Them Wrong: Be There for Secondary Students with an Emotional or

   Behavioral Disability. *TEACHING Exceptional Children*, *44*(1), 40-45.

Van Acker, R. (n.d.). Perspectives on services for students with emotional disabilities: a cause

   for concern [PowerPoint slides]. Retrieved from http://www.doe.virginia.gov/special_ed/

   disabilities/emotion_disability/presentation_richard_van_acker.pdf

Yoon Jin, M., & Hyun-Hwa, L. (2012). Incorporating an Authentic Learning Strategy Into

   Undergraduate Apparel and Merchandising Curriculum. *Journal Of Experiential

   Education*, *35*(1), 272-289

Application

Web Inquiry Assignment

How do you read a DNA Fingerprint?

The main idea of this Web inquiry activity is to present a real world application of the genetic code in investigative work to determine the identity of the perpetrator at a crime scene or to help a child find their biological parents. These are emotional issues that will hold the students' attention. Putting these dramatic scenarios into the study of genetics will interest the students. Acquiring the ability to solve the challenge will be a motivating factor.

Guided Inquiry: Teacher directed.

In line with the Virginia SOL BIO.5 - the student will investigate and understand common mechanisms of inheritance and protein synthesis. Key concepts include:

- prediction of inheritance of traits based on the Mendelian laws of heredity
- historical development of the structural model of DNA
- genetic variation
- structure, function, and replication of nucleic acids
- use, limitations, and misuse of genetic information
- exploration of the impact of DNA technologies

The teacher introduces the big question to the students by discussing such television programs as CSI, NYPD Blue, and The Mentalist about using evidence from a crime scene to identify the criminals. Daytime television hosts a wide variety of programs about paternity suits to determine who the father of the baby is. In Biology class, students can determine this by blood typing as well as by using the DNA fingerprint to identify correlating features of a DNA segment through gel electrophoresis.

Students are encouraged to pose questions about the procedure to guide the DNA fingerprinting research online. Present information to the students to begin the discussion process, leading students toward asking meaningful and important questions. In a self-contained special education class, suggestions should be given to get the students on the right track. Web sites for the research are given to the class to insure timely and successful access to knowledgeable information. These can be found on the DNA Fingerprinting site.

Important questions about profiling with the DNA fingerprint such as the following are utilized.

Where can a DNA source be found?

Who has the same DNA?

How do scientists make a DNA fingerprint?

How does this DNA fingerprint prove someone's identity? What does it show?

What can DNA fingerprints be used to prove?

The web inquiry researching the scientific procedure will lead the students to an understanding of this technique in investigative work. By taking notes individually, all the students are exposed to the information. Putting the students into groups to discuss this information reinforces the concepts and fills in the gaps of missing data between them.

After discussion, the students should identify key points in their research using their notes, open an account on Bubbl (http://bubbl.us) and create a detailed graphic organizer to display what they have learned. The students can share this diagram by copying the URL on the Google DNA Fingerprinting site.

At the bottom of this page, they will find a link to a DNA fingerprinting exercise - Can You Solve It? (http://www.biotechnologyonline.gov.au/popups/int_dnaprofiling.html); this exercise gives the students the opportunity to use what they have learned about DNA fingerprinting in two different scenarios, one to solve a robbery and the other to solve an issue of investigating a will of inheritance. Students should print the final page to turn in as part of the assignment.

When the activities have been finished, the students are given the original list of questions to write how much they have remembered about the procedure and its uses. They also

are able to write their comments as they go through each step on the DNA Fingerprinting site. This allows the students to express their opinions, trials and tribulations.

Student performance of this lesson is assessed by the following template:

1. Participation in developing inquiry questions prior to research; total: 5 points (No contribution - 0, engaging in conversation - 3, formulating question - 5)

2. Online research gathering pertinent information and taking notes; total: 5 points (No notes taken - 0, notes from one source - 3, two sources - 4, three or more sources - 5)

3. Group's Bubbl graphic organizer displays pertinent and extensive research; total: 5 points (bubbles [0-1] - 0, [2-4] - 1, [5-7] - 2, [8-10] - 2, [11-12] - 3, [13-14] - 4, [15-16] - 5)

4. Practical application reading a DNA fingerprint in online exercise; total: 5 points (no participation - 0, one exercise - 2, if correct - 3, both exercises - 4, if correct - 5)

5. Provides accurate information to inquiry lesson questions 1-5; total - 5 points (informative response: one question - 1, two - 2, three - 3, four - 4, five - 5)

   Extra credit: 1 point for comments added to web site.

   Total assignment points: 25   (26 with extra credit)

Lesson Website:

Google site: https://sites.google.com/site/dnafingerprintingwebinquiry/

Adventure Learning Programs

Global School Net - http://www.globalschoolnet.org/gsnexpeditions/bluezones/

Linking Kids Around the World!

- ➢ *Doors to Diplomacy* – Web projects on international affairs
- ➢ *International CyberFair* – Students from 115 countries research their community and present a project on it.
- ➢ *Online Expeditions* – Follow explorers and interact with them online.
- ➢ *GeoGame (Geography)* – Students experience cultural diversity in the world and learn map skills.
- ➢ *Newsday (Journalism)* – Students all over the world post newspaper articles they have written,
- ➢ *Letters to Santa* – Young students write to Santa; older students write back pretending to be Santa.

Jason Learning - http://www.jason.org

Education through Exploration

- ➢ STEM Curricula
  - o Climate – *Seas of Change*
  - o Energy – *Infinite Potential*
  - o Weather – *Monster Storms*
  - o Forces and Motion – *Terminal Velocity*

- Ecology – *Resilient Planet*

- Geology – *Tectonic Fury*

➢ Training – Professional Development

Journey North - http://www.learner.org/north

A Global Study of Wildlife Migration and Seasonal Change

➢ *Sunlight and the Seasons*

➢ *Plants and the Seasons*

➢ *Seasonal Migration*

Journey North for Kids App – view maps, take pictures, report findings

Live Cam

Polar Husky - http://www.polarhusky.com

Free Adventure Learning of Arctic Journeys in Online Environments

➢ *2015 Serum Run + Racing Beringia* – Live interactive expedition

➢ Previous Journeys

Earthducation - http://lt.umn.edu/earthducation/

What is Sustainability to You?

7 Expeditions to Every Continent in 4 Years 2011 - 2014

➢ 2014 Expedition 6 – Nepal – Live updates!

➢ Expedition 5 – North America – Completed April 10 – April 25, 2013

- Expedition 4 – South America – Completed October 20 – November 5, 2012

- Expedition 3 – Australia – Completed February 29th – March 12, 2012

- Expedition 2 – Norway, Europe – Completed August 15 – September 6, 2011

- Expedition 1 – Burkina Faso, Africa – Completed January 6 – January 27, 2011

- Expedition 0 – Baffin Island, Nunavut – Completed March 15 – March 30, 2010

After Expedition 6 – Asia,Earthducation will travel to Antarctica to end the project.

LT Media - http://lt.umn.edu/index.html

Learning Technologies Media Lab Design & Research Center at the University of Minnesota

Provide access to learning environments:

- WeExplore – adventure learning

- Avenue – e-assessment

- Flipgrid – video discussion

- Earthducation – education and sustainability

- GeoThentic – authentic geospatial technology

- North of Sixty – climate

> ➤ Avenue DHH – reading/writing portfolios

> ➤ Go North! – adventure learning

> ➤ Dig Me – digital, project based learning

Ride to Learn - http://ride2learn.org/pedagogy

Bike trip around the World, 7 Trips

> ➤ Europe

> ➤ Asia

> ➤ Australia

> ➤ Africa

> ➤ North America

> ➤ South America

> ➤ Antarctica

Reach the World - http://www.reachtheworld.org

Bringing the World Into the Classroom

> ➤ Classes are matched to follow a traveler throughout a semester or
>
> a year.

> ➤ Students and teachers participate in videoconferencing with their
>
> traveler.

AL Water Expeditions - http://adventurelearningat.com/

How Does Water Matter in Your Community?

Lesson plans, collaboration zones, inquiry projects

- ➢ *Define a Watershed*

- ➢ *Water Quality and Quantity*

- ➢ *Affects to Water Quality*

- ➢ *Utilizing Data*

- ➢ *Citizen Scientists*

- ➢ *Climate Change and Our Resources*

- ➢ *Place Based Journaling*

- ➢ *Environmental Education Lessons and the CCSS*

TerraQuest - http://www.doc.ic.ac.uk/~kpt/terraquest/

Virtual Expeditions on the World Wide Web (with educational workbooks)

- ➢ *Going South - Way South! -* an expedition to Antarctica to study

  penguins.

- ➢ *Head for Virtual Galapagos! -* a study of evolution.

- ➢ *Climbing Into History! –* rock climbing in Yosemite National Park.

  .

Jason Learning

Education through Exploration

Jason Learning is a nonprofit organization that was started by Dr. Robert D. Ballard in 1989 to bring authentic world experiences to students studying the areas of science, technology, engineering, and math (STEM). This program is affiliated with the Sea Research Foundation, Inc. and the National Geographic Society. Their curricula includes Climate, Ecology, Energy, Forces of Motion, and Geology, each involving many subcategories, is accessible online.

Jason Learning offers professional development for educators before starting the endeavor. They offer training workshops open to the public at various locations throughout the country on scheduled dates in different disciplines of STEM which can be reserved on their website. This gives teachers a chance to practice with the technology and extra curriculum activities to become familiar with the program.

Additionally, Jason Live is an online series of presentations by STEM role model professionals. There is also an online schedule of events with dates and times (usually 1:30 p.m. Eastern Standard time); however, if you cannot watch the live events, the previous engagements are recorded for you to enjoy with the speaker's name and profession to refine your search to align with your curriculum. These are motivational pieces to show in the classroom and arouse the curiosity of the students to begin discussion prior to a lesson, with or without buying and using the Jason Learning curriculum.

The Jason Learning Web site also provides a resource to follow national and state standards which can be used to find appropriate lessons and activities aligned to each standard in the Jason Expedition Center's Digital Library. This aspect gives teachers an easy to use source of appropriate accompaniments to their original lesson plans.

This is a brief overview of the curriculum for the different STEM disciplines which all include a book for students that provides expedition challenges to be solved by using the provided science facts, lessons, labs, activities, and videos. The teacher is provided a book of lesson plans with supplemental notes and resources. The curriculum also includes the online videos, games, and digital labs.

.

Climate Curriculum: Seas of Change

The Seas of Change is based on three authentic expeditions of scientists and engineers; students will see first-hand how the Earth's energy creating ocean currents, winds, and climate have an effect on the people and places around the world. They will also venture into the future predicting outcomes of meteorological conditions.

- Expedition 1: Earth's Ocean System – Beneath the Blue involves traveling on the exploration vessel *Nautilus* with oceanographer Dr. Katy Croff Bell.

- Expedition 2: Climate Connections: Drift and Flow takes students on the NOAA research vessel *Shearwater* with climatologists Commander Dr. John Adler and Dr. Diane Stanitski to appreciate how the climate is affected by ocean currents.

- Expedition 3: Climate Change: Models and Decisions explores creating climate models to study the causes and effects of the climate with scientist Dr. James Hack.

Energy Curriculum: Infinite Potential

This unit takes students on five different missions involving natural disasters and the energy resulting from earthquakes and tsunamis, restoring and providing energy.

- Mission 1: Critical Current – Defining Energy is presented by Space Weather Physicist Dr. Janet Green discussing the different forms of energy.

- Mission 2: Waves of Change – Calculating Transfers and Transformations explaining how energy is transferred by Dr. Vasily Titov, Director of NOAA Center for Tsunami Research.

- Mission 3: Power to the People – The Current State of the Grid is hosted by Dr. Larry Shadle from the National Energy Laboratory on meeting the demands for required energy.

- Mission 4: Energy Independence - The Quest for Sustainable Resources reveals alternative sources for energy from the director of the BioEnergy Science Center, Dr. Martin Keller.

- Mission 5: Energy Security – Powering Our Future explores outer space and the future with National Geographic explorer and Space Architect Constance Adams.

Weather Curriculum: Monster Storms

The Monster Storms unit delves into the elements of weather forecasting and predicting destructive forces, tornados, and hurricanes through five different guided missions.

- Mission 1: Profiling the Suspects – Trouble Brewing in Earth's Atmosphere provides the necessary information to predict a devastating storm from NASA/Goddard Space Flight Center/Wallops Flight Facility Airborne Science Manager Anthony Guillory.

- Mission 2: The Plot Condenses – Air and Water focuses on how the water cycle influences the creation of major storms and is led by Atmospheric Scientist Robbie Hood, also of the Wallops Flight Facility.

- Mission 3: The Chase – On the Run in Tornado Alley describes how concepts of physics and Newton's Laws of Motion results in extreme wind conditions with NGS Emerging Explorer and Senior Engineer Tim Samaras of Applied Research Associates.

- Mission 4: The Hunt – Flying Into the Eye follows Meteorologist Jason Dunion from the University of Miami NOAA/AOML Hurricane Research Division in identifying and tracking hurricanes.

- Mission 5: The Recovery – Living with Monster Storms reviews procedures to take before, during, and after storms to minimize the devastation of life and property. This mission is hosted by meteorologist Shirley Murillo from the Hurricane Research Division.

Forces and Motion Curriculum: Terminal Velocity

This curriculum leads students on four expeditions that cover scientific properties such as Newton's Laws of Motion as well as velocity, momentum, and acceleration, measurements, and machines.

- Expedition 1: Critical Measurements – The Quest for Exactness is hosted by Mechanical Engineer Dan Sawyer from the National Institute of Standards and Technology and explores the necessity for precise measurements in valid scientific procedures to be reliable.

- Expedition 2: A Universe of Motion – Motion, Velocity and Momentum is a unit to study motion investigated by Matt Brumbelow, a mechanical engineer for the Insurance Institute for Highway Safety in Arlington, Virginia.

- Expedition 3: Fundamental Forces – Forces and the Laws of Motion are explored by NASA's Jet Propulsion Laboratory engineer Kobie Boykins.

- Expedition 4: Make It Work – Work, Power, and Machines examines the roles that machines play in our society under the guidance of Lisa Jones, Research Fish Biologist at NOAA.

Ecology Curriculum: Resilient Planet

Resilient Planet utilizes five missions to demonstrate the basis for healthy ecosystems.

- Mission 1: Invaders – A Constant Ecological Battle identifies the living and nonliving aspects of an ecosystem in the Great Lakes with Ecologist and Senior Scientist Dr. Russell Cuhel.

- Mission 2: Survivors – Securing a Niche illustrates how organisms survive and interact to thrive while occupying the space of an ecosystem. This mission is hosted by Dr. Robert Ballard, Explorer in Residence and founder of the Jason Learning organization.

- Mission 3: Paradise Lost: A Fragile Environmental Recovery is a journey with Dr. Sylvia Earle where students use evidence from the field and scientific data to determine the health of the ecosystem.

- Mission 4: Paradise Found – Earth's Natural Treasures demonstrates to students the benefits of greater diversity in an ecosystem under the guidance of National Geographic Society Fellow Dr. Enric Sala.

- Mission 5: The Rescue – Protect the Biosphere calls students to be active leaders in the community accountable for safeguarding the Earth's ecosystems under the direction of Dr. Leila Hatch.

Geology Curriculum: Tectonic Fury

Scientists study minerals, underground elements, underwater landforms, mountains and volcanos, maps and exploration on four missions providing five to nine weeks of lesson plans, resources, and activities.

- Mission 1: The Building Blocks – Earth's Rocks and Minerals with Dr. Mike Wise, a geologist from Washington, D.C.'s Smithsonian Institution's Museum of Natural History, takes students mining for rocks and minerals.

- Mission 2: Earth's Changing Face – Weathering, Erosion, and Soils investigates the contour of the land resulting from wind and water forces with Dr. Virginia Dale, Director of the Center for BioEnergy Sustainability in Oak Ridge, Tennessee.

- Mission 3: Analyzing the Evidence – Dating, Fossils, and Geologic Time follows Dr. George Guthrie through history using innovative procedures for identification and classification.

- Mission 4: Earth on the Move – Plate Tectonics, Earthquakes, and Volcanoes illustrates the ever changing planet Earth hosted by Dr. Walter Smith, geophysicist for NOAA.

The instructional programs include readings, hands-on activities, online games, videos, and lesson plans which cover core content and standards of learning requirements.

Educational materials are purchased from the website store. Available items include an activity booklet with activities, games, and puzzles for $5.00, individual student books for $25.00, teacher's packs with one student book, one teacher book, and a DVD for $80.00, and larger volume kits with a teacher's pack and 30 student books for $800.00 and three teacher's packs and 100 student books for $2,400.00. In addition to the physical materials, the online access license to curricula missions and expeditions and related resources in the gated Web site must be secured at the cost of $13.00 per student with a minimum of 20 students, including a free teacher license for every 20 students procured. Rate quotes can be obtained from Jason Learning for bundles of 100 or more students. Furthermore, family packages with one teacher and two students for $125.00 and home-school packages with one teacher and five students for $165.00 are available.

The Jason Learning site also includes Citizen Science Projects that allow students to participate in organizations by contributing data from their classroom or field experiments to augment a research study in the following projects:

- Aecern Citizen Scientist is a free website that encourages students to participate in Discovery-Driven Mobile Learning^{TM} with the ability to transmit information through apps on iPads or iPhones to the Aecern website (www.aecern.org) and share the information with the network as well as students from various regions. Participants can choose from a list of questions on the site or think of their own question about the real world and develop a project using the scientific method to possibly find answers to this question. Results can be explored on the Aecern website Learning Environment for interaction and peer discussion.

- <mark>World Water Monitoring Challenge</mark> has an independent website to participate (http://www.worldwatermonitoringday.org/GetInvolved.aspx) and is also a part of the Jason Learning Seas of Change curriculum's Expedition 1. Students choose a water source in their area and measure the pH, salinity, turbidity, dissolved oxygen, and temperature and post the results along with pictures, videos, and comments on the site's data map which has results from 50 different countries.

- Project <mark>BudBurst</mark> (http://www.budburst.org/) is sponsored by the National Science Foundation and has directions and tutorials for observing plants, taking notes on the leafing, flowering, and fruiting of the plants, which are submitted with their location. The collective information is used to determine how different plant species respond to climate changes through the seasons.

- <mark>eBird</mark> has a website (http://ebird.org/content/ebird/) where students can register to provide information from a checklist of all the birds that were seen and heard on a birding outing including when and where they went. This data contributes to an international network that provides information to educators, land managers, ornithologists, and conservation biologists.

- <mark>Shark Finder^{TM}</mark> is a part of the Jason Learning School Adventure where students receive Classroom Adventure Kits that contain marine sediments with possible fossils of marine mammals, bony fish, and birds referred to as matrix. The students have explicit instructions on processing the matrix to properly identify the gravel, sand, and fossils. The host researchers, Jason Osborne and Dr. Aaron Alford, actually come to the classroom in addition to being available on Skype and Google Hangout to answer questions and provide scientific background

information. Processed fossils are sent to Dr. Bretton Kent at the University of

Maryland for further review for publication on scientifically significant fossils.

- <mark>Zooniverse-Old Weather</mark> is a Jason Connection to the Climate: Seas of Change

  curriculum. It can be accessed at http://www.zooniverse.org/project/oldweather.

  This project on climate involves transcribing ship's logs from U.S. Navy and

  Coast Guard ships from the mid 1800's to 1950. The transcriptions will provide

  information for climate model projections and past weather conditions.

  Zooniverse also has several other projects on space, climate, humanities, nature,

  and biology for students to participate in available on their website that are not

  affiliated with Jason Learning.

Moreover, Jason Learning holds contests for students to participate in, where they can

win prizes, such as Cell Phone Recycling Awareness and Sustainable Seas Art Contest.

While buying access to the curricula would provide the greatest benefit, participating in

projects, contests, and the live and recorded STEM professionals' video presentations are a

valuable addition to any class at no cost. Teachers and students can follow Jason Learning on

Facebook and Twitter or sign up for their email newsletter to keep up to date on new activities

and to share undertakings.