SKILLS FOR ADOLESCENCE AND THE SCIENCE CLASSROOM:  
CONNECTIONS BETWEEN ADVENTURE CHARACTER EDUCATION EXPERIENCE  
AND SCIENCE CLASSROOM EXPERIENCE  
by  
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ABSTRACT  
This study aims to describe the influence adventure character education has on the science classroom experience, specifically related to the translation of the concepts of respect, communication, cooperation, and trust developed in the adventure education program. It also aims to ascertain if students recognize the connections made between the two areas of their education experience. The research question investigated in the study is: What is the influence of the students’ participation in adventure character education on their science learning experiences? The study involved 39 participants who were 7th grade students in their second year of an adventure character education program. Data collection involved written responses to hypothetical science classroom vignettes and a short semi-structured interview. Interpretive case study methodology was used to describe and analyze the results of the investigation. The results indicate that translation of learning experiences is occurring between the adventure character education program and the science classroom but is more evident for some concepts than for others.

Key Words: character education, experiential education, adventure education, Experiential Learning Theory, Experiential Learning Cycle, interpretive case study methodology
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by

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DEDICATION

My thesis is dedicated to my parents for all the support, understanding, and love they have given me throughout my life. Without their wisdom, guidance, and patience, I would not be the person I am today, and my life would not be as wonderful as it is each day. I also dedicate this to my fiancé, Brian. Without his help and patience, my success would not have been possible. I love you all very much and thank God each day that you all are in my life.
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CHAPTER 1

“Tell me and I'll forget; show me and I may remember; involve me and I'll understand.”
- Lao Tzu

INTRODUCTION

Experiential education and character education are not new concepts to the world, but they have, in recent years, become the focus of attention. Schools have begun to adopt curricula based on character education that seem to show very promising results not only in character development but in the academic realm as well (Raymond, 2006b). There are even schools that have chosen to base the whole of their educational practices on experiential education. For example, the ANSER Public Charter School in Boise, Idaho bases its teaching on Expeditionary Learning-Outward Bound, which involves students participation in several month long learning expeditions (Raymond, 2006a). Benninga, Berkowitz, Kuehn, and Smith (2006) describe the ideal characteristics that schools have when efforts are made to include character education as a central theme in student learning. Their list of characteristics includes promotion of fairness, equity, caring, and respect; students contributing in meaningful ways; a clean and secure physical environment; and the promotion of a caring community and positive social relationships. Romanowski’s (2003) research revealed that high school students freely admit that character education is important. Students who experienced character education felt that it helped them to develop who they are as a person and suggested it would be beneficial at the middle school level (Romanowski, 2003). These high school students believed the discussion of character education topics would be more beneficial for early adolescents than for older students. Romanowski (2005) also gained the support of teachers for character education who believed their students were more aware of double-standards and questioned the actions of some of their peers. These examples provide support for the idea that character education
leads to positive learning outcomes and is perceived as positive by students and teachers.

Character education is obviously a beneficial aspect of schooling, but the way that character is learned is also a significant aspect of its success. Adventure education is an experiential approach to character development that is gaining popularity. The relationship between character education, experiential education, and adventure education can be confusing because the fields are very closely related but do have very significant differences which are discussed later. Adventure education is characterized by

(a) the planned use of adventuresome activities, (b) a real-life activity or learning context, (c) goal-directed challenges that must be solved individually and in groups, (d) an outdoor or wilderness setting, (e) cooperative, small group living and activity participation, (f) trained leaders/facilitators, (g) specific, pre-planned education or developmental goals. (Baldwin, Persing, and Magnuson, 2004, p. 168)

More and more evidence is showing that participants are truly benefiting from their experiences in adventure programs. Forgan and Jones (2002) show evidence of adventure education making a difference in social skills for special education students. Also, positive influences on life effectiveness, the behavioral and psychological facets of an individual’s functioning which establish his effectiveness or competence in any set of circumstances, are realized through adventure education according to Sibthorp and Arthur-Banning (2004). There are also entire books like Islands of Healing (Schoel, Prouty, and Radcliffe, 1989), A Teachable Moment (Cain, Cummings, and Stanchfield, 2005), and Adventure in the Classroom (Henton, 1996) that describe strategies for implementing adventure education as a counseling technique, a way to process experience, and an alternate way for students to learn. Adventure education is significant to this study because it is one of the foundations for the curriculum used in what the participating school calls Skills for Adolescence (SFA).

SFA is a supplemental class taken by students during their sixth, seventh, and eighth grade years. It makes use of the Lion’s Quest-Skills for Adolescence (Keister, Apacki, Kaye, and Barr,
2003) program as a curricular framework, which has been modified greatly to fit the needs and desires of the school. SFA takes the place of one of the regular academic class for one period each week. In the seventh grade, this substitution takes the place of science class. The focus of the seventh grade year is to build on and improve communication and leadership skills while providing an enjoyable and safe physical, mental, and emotional environment in which students can stretch their comfort levels. The SFA class combines discussions about topics relevant to early adolescents with initiatives and challenges, including a few low elements that are common within challenge course programs. Any apparatus or situation designed or constructed in a way that offers physical challenges which allows for the opportunity to include mental, emotional, and social components can be considered a low element. A low element can be classified into five different types: swinging, traversing, lifting, initiative, or other (Project Adventure Training Manual, 2004, p. 26). A swinging element involves a participant swinging from one point to another; a traversing element involves traveling from one point to another; a lifting element involves lifting participants off the ground and through or over an element; an initiative challenges the group to solve a problem; and an example of an other type element is any activity that is not easily classified into the other groupings and involves advanced spotting skills (Project Adventure Training Manual, 2004). The initiatives and challenges given to the students provide opportunities for them to develop when they least expect it; students who are not the typical leaders, become the leaders for a day while the classic leaders learn to become good followers. The program also includes activities and discussions about trust and character development.

One theme that takes into account these main ideas is collaboration. Collaboration is defined as “the act of working together, especially in a joint intellectual effort” (Dictionary.com). This definition incorporates, in some way, the skills that are attempted to be developed throughout the year- cooperation, respect, honesty, integrity, and several more. Each class
develops a Full Value Contract (FVC) that includes the traits the students believe to be important characteristics for a person to have.

The FVC was developed by Project Adventure and is an understood agreement amongst the students within the class and the teacher. It includes four main rules- be safe, be fair, be here, and have fun (Prouty, Panicucci, and Collinson, 2007). These rules (possibly better described as guidelines since there is no specific set of consequences that must be implemented if they are not followed), in addition to eight to ten other traits the class feels are important for a person with good character to have, become the FVC for the SFA class. All activities will then be discussed and connected back to the FVC to show a common thread that attaches to all events and areas of the program. Although each class may have a different set of characteristics making up their FVC, the traits they pick will most likely fall under one of the topics that have been chosen to define collaboration. The four main ideas included in collaboration for the purpose of this study are communication, cooperation, trust, and respect.

Communication directly relates to cooperation in that the students will need to be in contact with one another to successfully complete an initiative or challenge posed to them. Communication must also come into play when students feel the need to let others know they are uncomfortable with a situation in order to maintain a safe environment. As these types of situations arise, students will have the opportunity to learn to respect others and their decisions even though they may not understand or agree with those decisions. Furthermore, students will also be put in situations that test their integrity and honesty, providing chances for them to develop the skills needed to become positive leaders and role models. Many of the challenges the students will work through will require each student to be responsible for certain tasks; if each student does not do his own part, then the attempt to complete the challenge can be thwarted. This will develop each students’ ability to be trusted while allowing them to see the repercussions if they do not fulfill their responsibility without the consequences of real-life situations. Not only do students need to learn to be accountable themselves, but they also need
to learn to entrust others with the responsibilities delegated to them. This idea permits natural leaders the opportunity to hold themselves in check while others develop their own skills as individuals. The natural leaders also improve their leadership skills by becoming a component of the group instead of its chief. There are many more traits, characteristics, and lessons that are discussed and explored while the students move through the curriculum of SFA, but most address communication, cooperation, trust, and respect nested within the big idea of collaboration.

In order for experiences to become cemented in the students’ minds, each initiative or challenge is debriefed in some way. Several different techniques are used to prompt discussion and critical thinking to assist students in recognizing growth and character expansion. Debriefing can be used to help the facilitator understand what the students see as major issues within an initiative. This allows the facilitator to ask questions that help the students move through their own thought process but not necessarily lead them. Creating a headline, using rating systems, referring to a quote, or using special props are just a few methods used to debrief initiatives and challenges that give the students different experiences to help understand and seize the occurrences of the day. With those ideas being established, there is also the hope and goal that the skills and knowledge gained through SFA will be translated into other areas of the students’ lives, in particular for this study, the science classroom.

Purpose

The purpose of the study is to determine the influence of students’ participation in adventure character education on their science learning experiences. Although adventure education seems to be becoming more popular throughout the general education field, there still seems to be a lack of research on its effectiveness. Understand that adventure education is an aspect of character education; so, although there is a substantial amount of material on the broad topic of character education, there is still room for investigating the outcomes of
adventure education specifically, especially within the adolescent age. Glass and Benshoff (2002) make this a point of their paper on group cohesion through challenge course experiences. They also state that the lessons learned during adventure education can “apply to challenges in their personal lives” (Glass & Benhoff, 2002, p. 270). The findings of this research will provide insights regarding the influence of adventure education on students’ lives within a science classroom.

The skills and qualities focused on during adventure character education are also vital for providing the optimal learning environment in a science classroom. Core competencies of character education like respect, trust, communication, and cooperation are essential components of a receptive and safe science classroom atmosphere in which learning can occur without conflict. Harris, Mealy, Matthews, Lucas and Moczygemba (1993) understand that low-element challenge courses necessitate that learners exhibit cooperation, teamwork, and communication skills, which parallel the efforts needed in a science classroom. The main research question for this study is listed below:

- What is the influence of the students’ participation in adventure character education on their science learning experiences?

In order to better address this question thoroughly, two sub-questions were created to better apply the data being collected in this study for providing clear answers to the question. The sub-questions are listed below:

- Are students able to apply their understanding of the respect, trust, communication, and cooperation lessons learned during their participation in an adventure character education program to science learning experiences?
- Do students recognize connections between their understanding of these lessons learned during an adventure character education program and their application of these understandings in a science-learning context?
Much of the literature about adventure education is also based on specific types of student populations, like special education students, college students, and even corporate learners. This study will gather data from the middle school aged children and provide a basis to build upon to enhance the knowledge of whether students are associating and applying their adventure education learning experiences in other areas of their lives. Learning about the influence of adventure character education on the students’ science learning experience will enable middle school teachers to decide if the curriculum is beneficial to the classroom environment and could possibly have an influence in other subject areas as well. Teachers may be able to enhance their curriculum to improve the overall educational experience of their students.

**Theoretical Framework**

The theoretical framework of this research is based on David Kolb’s (1984) Experiential Learning Theory (ELT). The ELT is a combination of aspects stemming from theories constructed by Lewin, Dewey, and Piaget and is “a holistic integrative perspective on learning that combines experience, perception, cognition, and behavior” (Kolb, 1984, p. 21). Experience is the main focus of this theory, but the point should also be made that it includes how the experience is perceived, what changes the experience makes within a person, and how those experiences will have an impact in the future.

The Lewinian model of action research and laboratory training uses immediate experience, data collection, and observation which are evaluated and then used to make changes in a person’s actions and decisions in new experiences (Kolb, 1984). Its two main aspects being the “here-and-now concrete experience” and the “feedback process” which, when combined, allow for the “continuous process of goal-directed action and evaluation of the consequences of that action” (Kolb, 1984, p.22). Striving to find a balance between observation and action is the key reason for Kolb’s (1984) inclusion of Lewin’s ideas and their pertinence to experiential education.
Dewey’s model of learning is parallel to the Lewinian model, but it focuses more on “how learning transforms the impulses, feelings, and desires of concrete experience into higher-order purposeful action” (Kolb, 1984, p.22). Kolb (1984) highlights Dewey’s construction of purpose to involve present surroundings, prior knowledge of experience, the wisdom of experience from others, and judgment. Kolb (1984) goes on to further interpret Dewey’s model by stating that the (1) integration of experience fueling ideas, (2) ideas leading to impulse, and (3) patience to allow observation and judgment to have their influence on the situation are the ingredients for a “sophisticated, mature purpose [to] develop[s] from blind impulse” (p.22). After learning more about Dewey’s theory, it is reasonable to believe that Kolb includes Dewey’s model of learning as influence on his ELT to provide the rationale needed to explain the internal processing that can occur through experiential education.

Piaget’s impact on the development of Kolb’s theory stems from the cyclical interaction of accommodation and assimilation as Piaget describes it (Kolb, 1984). Once again, there must be a balance between conforming to new concepts of experience and adapting concepts to fit in with existing experience. This idea is better described by Kolb (1984):

When accommodation processes dominate assimilation, we have imitation-the molding of oneself to environmental contours or constraints. When assimilation predominates over accommodation, we have play-the imposition of one’s concept and images without regard to environmental realities. (p. 23)

Kolb (1984) goes on further to recognize that cognitive functioning progresses to higher levels as the “continual transaction between assimilation and accommodation” occurs (p. 23). Piaget’s contribution to the ELT is the suggestion of problem solving based on the hypothetical that can be drawn from the utilization of the methods of science, in a sense, to study the environment and provide justification and proof for decisions.

The ELT can best be described using Kolb’s Experiential Learning Cycle (ELC) which consists of four phases: concrete experience, reflective observation, abstract conceptualization,
and active experimentation. The ELC is frequently used to describe the experience of a
category of experiential education best known as adventure education, which is the focus of
learning for the purposes of this research. The concrete experience is the game, activity, or
challenge itself; the physical motion of the experience. The reflective observation is a review of
the events that occurred during the concrete experience that summarizes the activity for the
next phase of the cycle. Reflective observation flows easily into the abstract conceptualization
phase when the discussion turns from reviewing specific events to making “generalizations and
abstractions” (Prouty et al., 2007, p. 37). The active experimentation phase is when the
learning is transferred from the specific situation in which the learning occurred to a new,
different experience.

Two of the phases, concrete experience and abstract conceptualization, focus on how
people “absorb experience”, or construct understanding from experience, while the other two
phases, reflective observation and active experimentation, depict how people “deal with
experience” (Prouty et al., 2007, p. 36). The phases can also be referred to as the experience,
the what?, the so what?, and the now what? of a single experience and can be used in
facilitation and the debriefing of experiences (Prouty et al., 2007). Ensuring the opportunity for
each phase to occur during a learning experience is vital to allow the learner to entirely
consume themselves within the learning process.

Each phase is suggested to appeal to different types of learning styles which Kolb labels
as diverging, assimilating, converging, and accommodating (Prouty et al., 2007). A description
of these learning styles is given below:

[A] person who combines concrete experience and reflective observation has a
diverging learning style. This learner tends to diverge from conventional solutions, is
often imaginative, and is effective at brainstorming and generating many ideas. A
person who uses reflective observation and abstract conceptualization has an
assimilating learning style. This person takes a learning experience and connects it to a
larger framework of ideas and develops theories from that experience. There is an analytical component to this style, taking an experience and translating it into concise and logical form. A learner who emphasizes abstract conceptualization and active experimentation prefers the *converging learning style*. This person gathers information to solve problems and tends to be a commonsense thinker. Finally, someone who primarily uses the learning phase of active experimentation and concrete experience uses the *accommodating learning style*. This person is a doer, wanting to put ideas into immediate practice. Hands-on experience is crucial for these learners. (Prouty et al., 2007, p. 38)

In working with almost any group of students, each of these learning styles is represented by someone; by providing the group the opportunity to have an experience that follows the ELC, each student's learning needs would potentially be included (Prouty et al., 2007). Kolb’s (1984) ELT has been used in a considerable number of careers like computer and information science, psychology, medicine, nursing, accounting, law; it can also be applied to all types and levels of education (Kolb, Boyatzis, & Mainemelis, 2000). It is continually referenced by the leading company in adventure education, *Project Adventure, Inc*. Project Adventure regularly uses the ELC within its training sessions and manuals as a way for facilitators to help evaluate and plan for the groups with which they work. There is also ongoing research devoted to the advancement of experiential learning; the latest articles and research being done in a vast array of fields can be found at www.learningfromexperience.com.
CHAPTER 2
REVIEW OF LITERATURE

Discovering the connections that exist between the lessons learned in SFA and application in the science classroom is the basis of this study. In an effort to explore all aspects of the study, literature is presented in this section that illustrates the main workings of the SFA program and adventure education. Character education, experiential education, and adventure education are all discussed individually in addition to how they are associated with one another to produce the premise behind the SFA program. The history and development of adventure education are also significant contributors for the background of this study and are, therefore, included in the review as well. Lastly, extant research on adventure education is presented.

Character Education

Character education, experiential education, and adventure education are intertwined to produce the SFA program implemented by the participating school in this research study. Understanding each of the three components used to create this program is essential for understanding its potential and effectiveness. Character education seems to be the broadest of the three areas including countless research studies that address moral education, values education, and even “morality”. The Association for Supervision and Curriculum Development (ASCD) provides the definition of character education as “involv[ing] teaching children about basic human values including honesty, kindness, generosity, courage, freedom, equality, and respect with the goal of rais[ing] children to become morally responsible, self-disciplined citizens” (ASCD, 2007). The push for character education to be returned to school programs everywhere began when President Clinton spoke about it in his 1996 State of the Union address, and its support continued when President Bush tripled the federal funding of the U.S.
Department of Education fulfilling a campaign promise from the 2000 election. The research base on character education is vast and wide, with positive reviews by implementers, students, and analysts, and covering all ages and realms of education.

Specific to this research study, the Lions-Quest Skills for Adolescence program is an example of character education curriculum. The Lions-Quest program develops young adolescents’ “essential social and emotional competencies, good citizenship skills, strong positive character, skills and attitudes consistent with a drug-free lifestyle, and ethic of service to others within a caring and consistent environment” (Substance Abuse and Mental Health Services Administration (SAMHSA), 2007). The program was developed for students ages 10-14 in the sixth through eighth grades. It began in 1985 and is in its fourth edition. It is used in more than 33 countries by over 300,000 implementers (SAMHSA, 2007). The Lions-Quest conceptual model describes “how a nurturing external environment in which children learn critical life skills influences and supports the internal condition that encourage their positive social behaviors and commitments and reduces their risk for problem behaviors such as substance abuse and violence” (SAMHSA, 2007). The program works to unite the educators, parents, and community members of adolescents as a force for helping them develop into moral citizens. The curriculum is designed in units that address issues adolescents face as they enter their teenage years – building self-confidence and communication skills; service learning; managing emotions in positive ways, improving peer relationships, strengthening family relationships, making healthy choices; setting goals for healthy living; and developing potential (SAMHSA, 2007). The Lions-Quest Skills for Adolescence program is recognized as a model program by the Substance Abuse and Mental Health Services Administration. Its pillars serve as the basis for the SFA program within this study. However, SFA does not follow directly along with this program. In addition to the influence of the reading, journaling, and discussion of the Lions-Quest curriculum, the SFA program utilizes experiential and adventure education to enhance the students’ learning experiences.
Experiential Education

Experiential education encompasses both character and adventure education. The definition of “experiential education” is still open to conversation and varies from source to source. The Association of Experiential Education (AEE), the leading advocate of experiential education, defines experiential education as “a philosophy and methodology in which educators purposefully engage with learners in direct experience and focused reflection in order to increase knowledge, develop skills, and clarify values” (AEE, 2007). The AEE goes on to include a more detailed and in-depth list of principles for experiential education practice that ranges from choosing the experience to developing relationships to examining one’s values to learning from natural consequences (AEE, 2007). Prouty, Panicucci, and Collinson (2007) describe good experiential education as “engag[ing] the whole learner and thus us[ing] a variety of techniques to involve and unite our physical, emotional, rational, and spiritual selves” (p. 12). Experiential education, therefore, works to improve and develop a person in any and every way possible. With that in mind, then, it makes sense that experiential education includes all types of learning that lead a person through an experience in some way whether it is through reading and responding or by physically moving through an experience and processing what is learned.

Adventure Education

The latest literature regarding adventure education defines it as “direct, active, and engaging learning experiences that involve the whole person and have real consequences” (Prouty, et al., 2007, p. 4). The word adventure applies to a “whole range of experiential programming because it captures [these] techniques [that] involve the whole person” as well as the “tradition of maximizing the learning zone” of a person (Prouty, et al., 2007, p. 12-13). More specifically, the “adventure” of education exists when students are engaged by an experience that is both “unique and relevant” and provide challenges or “moments when [they] are on the brink of both success and failure, and where they both succeed and fail” (Panicucci, et al., 2002, p. 1). Adventure education is based on learners taking risks of some sort, “not necessarily
physical risks, but emotional and apparent physical risks where students see natural consequences before them” (Panicucci, et al., 2002, p. 1). Adventure education can be considered a subcategory of experiential education, specifically an area with a more physical emphasis than some other areas of experiential education, but not the most physical category possible. However, adventure education and experiential education definitions are “merging and becoming less distinguishable because the element that makes experiential education an adventure is not just how active or physically risky the activity is, but what the learner’s overall state of mind is” (Prouty, et al., 2007, p. 4).

**History of Character and Adventure Education**

In looking at the history of adventure-based character education, the first evidence appears to be the “whole-child camping experiences” sponsored by the Young Men’s Christian Association (YMCA), Young Women’s Christian Association (YWCA), and the American Youth Foundation from around 1910 to 1920 (Prouty, et al., 2007). These camping experiences included hiking, camping, swimming, and cooperative play to address the needs of the whole child – social, physical, emotional, and spiritual. The first big push for character development through education seemed to occur with Kurt Hahn’s Salem Schools in Germany and Scotland in which intellect and character were equally balanced in education in order to develop the whole child (Outward Bound, 2007). Hahn’s intellectual understanding of the significance of experiential education in developing character and his place at this point in history left him able to influence education in the United States and the United Kingdom (Prouty, et al., 2007; Outward Bound, 2007). From the 1920’s to around 1940, John Dewey’s writings about a “balance of hands-on work with classroom work” in a democratic classroom inspired a progressive education movement which was basically an early form of experiential education (Prouty, et al., 2007, p. 7).

The next and one of the most significant influences on adventure-based character development is Outward Bound. Outward Bound was first developed in the United Kingdom in
1941 and made its appearance in the United States from 1960 through 1980 (Outward Bound, 2007). It is a month-long course of intense physical, emotional, and mental challenges typically in a wilderness location (Miner & Boldt, 1981). Kurt Hahn was a major influence in developing the program in the United Kingdom, while Josh Miner brought a model based on Hahn’s work to the United States. Its popularity allowed Outward Bound to grow quickly to the largest adventure education organization of the time, and it remains the largest organization today (Prouty, et al., 2007, p. 8). The Outward Bound Process Model can be used to define the process of adventure education. It is a series of seven processes that explain how Outward Bound and programs like it work. A (1) “motivated and ready learner” is put into a (2) “prescribed physical and social environment” in which the learner is then given a (3) “characteristic set of problem-solving tasks” which (4) “creates a state of adaptive dissonance” leading to (5) “mastery or competence” which allows for the (6) “reorganization of the meaning and direction of the experience”; by this process, the learner (7) “continues to be oriented toward living and learning” (Walsh & Golins, 1976; Wilderdom, 2007).

Outward Bound lead to other adventure education organizations like the National Outdoor Leadership School (NOLS). In 1965, Paul Petzoldt started the NOLS to focus on the training of skills needed to lead others in the wilderness (NOLS, 2007). The NOLS focuses on leadership skills, “the technical skills needed in the wilderness and the interpersonal judgment skills needed to lead teams in that setting”, was solidified by Jim Ratz and John Gantz (Prouty, et al., 2007, p. 8). The initiatives of “Leave No Trace” and the “Wilderness Risk Managers Conference” both developed from the NOLS program.

The next phase in the expansion of adventure education was Project Adventure, Inc (PA). which started in 1971. Jerry Pieh wanted to “make the benefits of an Outward Bound experience available to everyone,” an idea which he presented in a 1969 thesis at Harvard University (Prouty, et al., 2007, p. 8). Pieh implemented his ideas at Hamilton-Wenham Regional High School and developed an evaluation that discovered “increased self-confidence,
independence of thought, and improved school climate” based on a program that combined “interdisciplinary academic classes that used the team and leadership skills learned in a 10\textsuperscript{th}-grade physical education class, a series of initiative problems, and low and high challenge courses” (Prouty, et al., 2007, p. 8). The U.S. government named PA a “program that works” and allotted funding to schools across the country for program implementation. PA is now the leader in teaching facilities-based training and development, and the mission of PA is “to develop responsible individuals, productive organizations, and sustainable communities” (PA, 2007).

The Association for Experiential Education (AEE) began in the early 1970’s when a group of educators came together to make education more relevant (AEE, 2007); its purpose was to promote the study and spread of the experiential education movement that would become apparent in the mid-1970’s. AEE is still the cover-all organization for the adventure movement today with international participation and initiatives on accreditation and increased research. Another advocate of experiential learning and education today is Experience Based Learning Systems, Inc. (EBLS) which is a company “devoted to advancement of the theory, research, and practice of experiential learning” (EBLS, 2007). The founder of this company is David Kolb who also worked on the ELT and the ELC. EBLS provides a list of current research projects, as well as, a comprehensive list of works throughout time that deal with experiential learning. Since the establishment of the AEE, several significant articles and books have been published that outline adventure programming and teaching, explain the theories behind this type of education, describe assessment tools to assist in the adventure process, and illustrate common adventure initiatives and challenges. *Cowstails and Cobras* (Rohnke, 1977), *Cowstails and Cobras II* (Rohnke, 2003), *Islands of Healing* (Schoel, Prouty, and Radcliffe, 1989), *Experiential Learning: Experience as the Source of Learning and Development* (Kolb, 1984), *Silver Bullets* (Rohnke, 1989), *Quicksilver* (Butler and Rohnke, 1989), and *Adventure in the
Classroom (Henton, 1996) are among the works devoted to adventure education, describing how it should be used and its contribution to character development.

An interesting and possibly unanticipated link to adventure education is the connection between Socrates, Plato, and Aristotle to adventure programming done by Priest and Gass (1997). They highlight Plato’s belief that virtues like wisdom, bravery, temperance, and justice were “key qualities for young people to acquire in order to assume leadership roles in an ideal society,” and that they needed to be experienced in a way that made them act justly, wisely, bravely, basically in an overall virtuous manner (Priest & Gass, 1997, p. 13). Plato, as well as, Aristotle also identified danger, risk, and safety as virtues needed for growth as a human which forms a direct connection with the cornerstones of adventure programming today (Priest & Gass, 1997). Priest and Gass (1997) also refer to William James’ philosophy of pragmatism which is based on “the belief that the value of any learning experience is determined by the degree of learning that occurs from the actions and consequences of such learning experiences” (p. 14). To provide philosophical anchoring for character education with this philosophy and make the direct connection to adventure education, specifically the active experimentation phase of the ELC, Priest and Gass (1997) include the “pragmatic maxim” (p. 14). It states that “theories, experiences, and any learning only possess value if they are practical, that is, if they help an individual learn and apply new learning to everyday life” (Priest & Gass, 1997, p. 14). This statement that could easily be used to describe what happens in the active experimentation phase of the ELC.

**Resurgence of Experiential Education**

Prouty, et al. (2007) suggest that the “most effective mode of education is the adventure or experiential model, and that this model is so effective because it resonates with our biology and our history as a species” (p. 5). These authors also believe that people are “hardwired” to learn in small groups, “experientially through interaction with others and through in-depth, direct experience”; explaining that throughout history, people have used “oral communication, direct
and physical learning experience, and modeling from others” to learn to hunt, farm and make crafts (Prouty, et al., 2007, p. 4).

The rise of the industrial revolution in the 20th century caused a shift in education that lead schools to be more “factory-like”, concentrating on the skills needed to be a good factory worker like “timeliness, literacy, and numeracy” (Prouty, et al., 2007, p. 5). Students were not encouraged to solve problems in a team environment because that was not necessary in the industrial workplace; instead, they were expected to be “obedient, informed, yet passive workers in a school setting not unlike a large, industrialized workplace” (Prouty, et al., 2007, p. 5). In contrast, the needs of the 21st century student are quite different than those of the previous era. The information age of today necessitates that workers in all fields can offer their intellectual property and knowledge in “collaborative teamwork”, “creative problem solving and product development”, “communication with passion and skill to influence others”, and a “sense of ethics and corporate responsibility for the greater community”; skills that adventure education is exceptionally designed to address (Prouty, et al., 2007, p. 5). It should be of no surprise that people feel more comfortable learning as they did before the industrial age began, in a more experiential manner that better fits our biological “wiring”. Tools and products developed from adventure education allow for orchestrated immersion to happen while learning which lets students feel more relaxed and alert to take the risks necessary for growth (Caine & Caine, 1994).

Adventure education has extended its reaches into an amazing range of settings including the U. S. Central Intelligence Agency (CIA), National Aeronautics and Space Administration (NASA), and other government agencies and colleges around the world (Prouty, et al., 2007). With the adventure education market is becoming more equal between wilderness-based programs and facilities-based programs, learning through adventure education is much easier and affordable for all types of programs, allowing for nearly the same outcomes in both settings (Prouty, et al., 2007). Its mark has been made within education,
psychology, and even the corporate realm. This experiential field is also becoming more established by including opportunities for continuing education credits, certification of different adventure education practitioner skills, undergraduate and graduate level degrees, and accreditation programs by the AEE. Furthermore, government is becoming a bigger advocate of adventure education as well. Parks and recreation departments are including adventure education programs with challenge courses as their focus, and many countries now set aside money for adventure learning activities (Prouty, et al., 2007). The push for more research on the effectiveness of programs is also a focus of the adventure education field. Evidence of this exists in the requirement of programs funded by U. S. federal and/or state agencies for studies that investigate and support the effectiveness of the programs implemented (Prouty, et al., 2007).

Adventure education is also becoming the basis for primary programming within several education models rather than a supplemental element. For example, the Expeditionary Learning Schools-Outward Bound uses adventure methods for “whole-school reform” (ELS, 2007), while PA’s Behavior Management Through Adventure (BMTA) program engages learners in an alternative school based on adventure therapy (PA, 2007). These are only two examples, but several other programs exist that utilize adventure education as the basic model for learning, therapy, development, and growth. The international attractiveness of adventure education, meaning it has spread from mostly European influence to many other varieties of cultures, also verifies the magnetism of experiential methodologies and human nature (Prouty, et al., 2007).

Jacobson and Ruddy (2004) also promote experiential learning under the belief that “learning that really sticks, that comes to guide us in times of crisis, is learned through our own experiences” (p. 7). They go on to discuss the importance and effectiveness of “experiential reflection”, yet another component of experiential education, in their book Open to Outcome.
which guides facilitators in being more effective for their participants and their participants’ path through the ELC.

**Research Supporting the Effectiveness of Adventure Education**

Although research on adventure education programs for early adolescents is limited, studies done with varying participant characteristics and differing levels of program intensity provide support for the effectiveness of adventure education for this group. For example, Sibthorp and Aurthur-Banning (2004) investigated the development of life effectiveness in similarly aged adolescents after participation in an adventure program that included SCUBA diving, hiking, and other adventure activities. In the context of this study, life effectiveness meant the mental and behavioral components of the way a human functions which decide a person’s effectiveness in any situation. Their results showed that “personal empowerment”, a person’s ability to maintain and take control of the actions, and decision of one’s life situations, gained during this program was an essential component in developing the life effectiveness of its participants (Schultz, Israel, Zimmerman, & Checkoway, 1995).

Another study of adolescent aged participants was conducted by Glass and Benshoff (2002). They explored group cohesion as an outcome of challenge course experiences. Their results show support for adventure education, specifically the challenge course experience, in its effectiveness at establishing awareness and development of group cohesion. Glass and Benshoff (2002) believe group cohesion to be a major factor in adolescent lives because “being part of a group is an important step in an adolescent’s search for acceptance and identity” (p. 268). These researchers believe that “small group experiences can be critical for adolescents because of the increasingly important role peers play in their lives and the powerful impact of the peer group on adolescent behavior” (Glass & Benshoff, 2002, p. 268). They also credit the increase in group cohesion to the “group discussions themselves and how challenge activities may relate to everyday lives,” which are major processes in the adventure program described in
this study (Glass & Benshoff, 2002, p. 272). Another positive point for adventure education is revealed in this study as well. It is reported that racial backgrounds, age, and gender do not seem to affect group cohesion. Although Glass and Benshoff (2002) only focused on one factor, it is feasible that this holds true for other factors, suggesting that adventure education can “cross barriers” for increased character development (p. 273).

Additional endorsement of adventure education comes from Outward Bound research and other outdoor adventure education studies. Sheard and Golby (2006) discovered that “total hardiness” was increased in participants with a longer exposure to adventure education. Total hardiness is “personal characteristic encompassing three interrelated component styles (commitment, control, and challenge), which facilitates the management of stressful circumstances by turning them into growth-inducing rather than debilitating experiences” (Kobasa, 1979, p. 3). In other words, these participants learned to see trying, challenging situations as “positive opportunities rather than as frustrating problems” (Sheard & Golby, 2006, p. 203). McKenzie’s (2003) study of “The Outward Bound Process” revealed multiple characteristics that enhanced participants’ skills, self-awareness, self-confidence, self-reliance, self-esteem, self-concept, and concern for others through learning new skills, setting and achieving goals, working as a group, group discussions, having leadership responsibilities, and taking care of others. The aforementioned characteristics and activities accredited to their development are all foundational to the program being researched and in adventure education in general. In addition, Goldenberg, McAvoy, and Klenosky (2005) investigated the outcomes of the Outward Bound experience and found that “developing relationships with others and working as a team emerged as one of the most commonly mentioned” aspects of the adolescents’ participation (p.138). Other outcomes that emerged from the Outward Bound experience included physical fitness, self-reliance, appreciation, teamwork/cooperation, determination/perseverance, and personal growth (Goldenberg, et al., 2005). The same research also revealed values that participants took away from the program such as self-
awareness, achievement of personal goal/value, self-confidence/esteem, and transference, or “transferring the skills and knowledge obtained through their experience to work, school, other activities, and to life in general” (Goldenberg, et al., 2005, p. 132).

More closely aligned with the program under study, Forgan and Jones (2002) reported the improvement of behavior in students with disabilities and behavioral disorders after implementation of the Project Adventure curriculum. After analyzing the time out records and behavioral point averages before and after program implementation, Forgan and Jones (2002) found a decrease in student misbehavior and an increase in students’ problem-solving skills. The time out records and behavioral point averages are both tools used to measure the student’s school behavior; the higher the student’s daily score, the better behaved the student was that day. Although the participants have disabilities and learning disorders that are not always present in every group of participants, it is still practical to believe the same type of results could be found during other studies.

Research on the transfer of adventure character education experiences and their connections to the performance in other content areas appears to be nonexistent which provides a basis for this study. The literature presented in this section provides insight into the creation of the adventure education field and offered evidence that adventure programming does provide outcomes of importance. The review also touched on the concerns about the lack of research that exists about the outcomes of adventure education particularly related to adolescents and programs similar to SFA. Therefore, the findings of this study will contribute to the collection of knowledge that already exists and propose questions that will need further investigation.
CHAPTER 3
RESEARCH METHODOLOGY

In this section, the demographics of the students participating in the research study are described. Also, interpretive case study methodology is described in detail and a rationale for its application to this research study is also included. This section provides an explanation for the types of data collected and how they were analyzed.

Participants

A total of 73 students take part in the 7th grade SFA program under investigation, but only 39 students received permission from parents or guardians and volunteered to participate in the research study, consistent with institutional review board research guidelines. The 39 participants are representative of the entire class composition although it is only about half of the entire 7th grade class. The students attend an independent, non-profit college preparatory co-education school located in the southeast region of the U. S. The school has no specific religious affiliation but is guided by Judeo-Christian ethic and fosters respect for the heritage and beliefs of others. Fifteen of the participants were males and 24 participants were female; they range in age from 11-14 years old. Of the research group, 29 participants have siblings, 23 play an instrument, and 33 participate in at least one sport. The participant group is predominantly Caucasian with a significant number of students from different and varied ethnic backgrounds.

Research Design and Methodology

The school in which the SFA program exists was the site chosen to conduct this research study along with the 2006-2007 7th grade class of the school. To explore the influence of the student’s participation in the SFA program on their science learning experiences, an initial
vignette (Figure 3.1) was given to all 39 participants and prompted the students to provide a written response to the scenario described. Analysis of their written responses allowed for the researcher to explore the concepts making the translation between the SFA program and the science classroom. Concept-specific vignettes requiring written responses and an interview allowed the researcher to further investigate the concepts making the transfer and to discover the recognition of this translation by only four students from the overall participant group. All vignettes were designed as hypothetical science classroom scenarios in which the reader faced some sort of challenge or task that needed to be handled in some way. After reading each vignette, the participants were to express all of their thoughts, feelings, and intentions about the situation presented to them from multiple perspectives and, only for the initial vignette, as different characters in the story as well. The participants were asked to include everything they thought about and to be completely honest in their written responses. Each vignette was then scored based on the number of key words or phrases the participants included in their responses; the total number of key words or phrases lead to different scores as determined on the rubric. Each rubric ranged from a score of 0 to 3 points in four categories, respect, communication, cooperation, and trust. The total for each category was then used to obtain the mean score for that participant. The scoring scale for all vignettes starts with the lowest being 0 and ends with the highest at 3 based on the points possible as indicated by the rubrics. Using means as data allows the researcher to take a more in depth look at the key characteristics that may be making the translation to other parts of the participants' lives because it allows for a number to be given to a set of thoughts or ideas that indicate the translation of knowledge.
## Acid Rain Rubric

<table>
<thead>
<tr>
<th></th>
<th>Respect</th>
<th>Communication</th>
<th>Cooperation</th>
<th>Trust</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A lot</strong></td>
<td>3 or more pieces of evidence that relate to respect; the evidence may be related words or what the analyst considers an explanation of respectful acts, intentions, or thoughts</td>
<td>3 or more pieces of evidence that relate to communication; the evidence may be related words or what the analyst considers an explanation of acts, intentions, or thoughts of communication</td>
<td>3 or more pieces of evidence that relate to cooperation; the evidence may be related words or what the analyst considers an explanation of acts, intentions, or thoughts of cooperation</td>
<td>3 or more pieces of evidence that relate to trust; the evidence may be related words or what the analyst considers an explanation of acts, intentions, or thoughts of trust</td>
</tr>
<tr>
<td><strong>(3)</strong></td>
<td></td>
<td>(3)</td>
<td>(3)</td>
<td>(3)</td>
</tr>
<tr>
<td><strong>A little</strong></td>
<td>2 pieces of evidence that relate to respect; the evidence may be words or what the analyst considers an explanation of respectful acts, intentions, or thoughts</td>
<td>2 pieces of evidence that relate to communication; the evidence may be words or what the analyst considers an explanation of acts, intentions, or thoughts of communication</td>
<td>2 pieces of evidence that relate to cooperation; the evidence may be words or what the analyst considers an explanation of acts, intentions, or thoughts of cooperation</td>
<td>2 pieces of evidence that relate to trust; the evidence may be related words or what the analyst considers an explanation of acts, intentions, or thoughts of trust</td>
</tr>
<tr>
<td><strong>(2)</strong></td>
<td>(2)</td>
<td>(2)</td>
<td>(2)</td>
<td>(2)</td>
</tr>
<tr>
<td><strong>Not much</strong></td>
<td>1 piece of evidence that relates to respect; the evidence may be related words or what the analyst considers an explanation of a respectful act, intention, or thought</td>
<td>1 piece of evidence that relates to communication; the evidence may be related words or what the analyst considers an explanation of an act, intention, or thought of communication</td>
<td>1 piece of evidence that relates to cooperation; the evidence may be related words or what the analyst considers an explanation of an act, intention, or thought of cooperation</td>
<td>1 piece of evidence that relates to trust; the evidence may be related words or what the analyst considers an explanation of an act, intention, or thought of trust</td>
</tr>
<tr>
<td><strong>(1)</strong></td>
<td>(1)</td>
<td>(1)</td>
<td>(1)</td>
<td>(1)</td>
</tr>
<tr>
<td><strong>Nothing</strong></td>
<td>No evidence that relates to respect or what the analyst could consider an explanation of respectful acts, intentions, or thoughts</td>
<td>No evidence of communication or what the analyst could consider an explanation of acts, intentions, or thoughts of communication</td>
<td>No evidence of cooperation or what the analyst could consider an explanation of acts, intentions, or thoughts of cooperation</td>
<td>No evidence of trust or what the analyst could consider an explanation of acts, intentions, or thoughts of trust</td>
</tr>
<tr>
<td><strong>(0)</strong></td>
<td>(0)</td>
<td>(0)</td>
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</table>

Figure 3.1. Acid Rain rubric used as the initial rubric for all participants.
The participant field was then decreased to 4 participants based on four factors. The first factor was the participant’s mean score for the initial vignette. The second factor was the researcher’s perception of the participant’s ability to convey his thoughts openly and thoroughly. The third factor was the researcher’s belief that the participants would be honest in providing responses to questions. The last factor was simply the willingness of the student to participate.

Those 4 students selected to continue the research were then given the set of vignettes, hypothetical science classroom situations. Each of the four vignettes dealt with a science classroom scenario specific to one of the key characteristics developed through adventure education: respect, communication, cooperation, and trust. Each of these vignettes also included rubrics with point totals based on the quantity of key words or phrases included in the responses. The scoring scale was from 0 to 3 points on these rubrics with each of the key categories being broken down into two subcategories which were scored and then averaged to obtain the mean score for each vignette in the set. Respect was represented as “self-respect” and “respect for others”. Communication was represented as “listens to other” and “able to provide clear explanation of thoughts and feelings to others”. Cooperation was represented as “offers assistance to others” and “accepts assistance from others”. And last, trust was represented as “being trustworthy” and “entrustment in others”.

The participants were then asked to take part in a short interview that allowed the researcher to probe for more in-depth details regarding their learning experiences and feeling about the program. The structure of the interview was based on the semi-structured interview guide approach as described by Patton (1990). It provides the interviewer with a basic set of questions or issues that can be explored freely throughout the interview. Conducting an interview allowed for a different type of data regarding the same information to be gathered and used to answer the questions of this investigation. It should be understood that the data
collected was based on the students’ intentions of actions in the science-learning context and was not actual behavioral data.

Interpretive case study methodology was used to analyze and present the data gathered from the four students. Yin (1994) describes a case study as “an empirical enquiry that investigates a contemporary phenomenon within its real life context” (p. 13). Patton (1990) also recognizes case studies as important because they are “particularly useful where one needs to understand some particular problem or situation in great depth, and where one can identify cases rich in information” (p. 19). The type of case study used in this research should also be considered “instrumental” in that “the case is of secondary interest; it plays a supportive role, facilitating our understanding of something else” (Stake, 1994, p. 237). Therefore, interpretive case studies were designed to present the findings of the research and to assist in the “exploration of area[s] where existing knowledge is limited” (Darke, Shanks, & Broadbent, 1998, p. 275).

**Data Collection and Analysis**

The initial vignette, along with a six question demographic questionnaire, was given to all the participants in the study. The acid rain vignette provided the students with a scenario in which all four concepts could potentially have been expressed as part of the resolution to the situation, allowing the opportunity for evidence supporting the transfer of knowledge to appear. All participants were provided with time to respond to the four key characteristics under investigation. At this point, each response was analyzed and scored for key words and phrases that could be associated with lessons learned during SFA. Four other teachers employed at the same school as the researcher were all asked to score the initial responses of two participants to ensure the reliability and validity of the researcher’s scoring approach. Two of the teachers were female and taught the students participating in the study; one was the history teacher and the other was the mathematics teacher. The other two teachers were both male and the SFA
facilitators for the 6th and 8th grades within the same school. The 6th grade teacher was also a
6th grade science teacher, while the 8th grade teacher taught geography.

At this point in the research the participant number was decreased to 4 participants
based on those four factors mentioned in the previous section. After reviewing the mean scores
of all participants, the scores were organized into four groups, each group including roughly
25% of the respondents. One student was chosen from each of the four different groups. One
student scored a 1.25, one student scored a 1.75, another student scored a 2.25, and the last
student scored a 2.75. The researcher chose one male and one female from each end of the
scoring range, 1.25 being the lowest and 2.75 being the highest, with the middle of the scale
being 2. These four students were then given the set of four vignettes to read and respond to.
The student responses were once again scored by other teachers to establish reliability and
validity, but only the two 7th grade teachers and the 6th grade science teacher were included in
that scoring.

The next step of the investigation consisted of the very short interview with the 4
students about their responses to the vignettes, their feelings about SFA, and the recognition of
the translation between the two areas. A second short interview was also conducted to clarify
responses from the first interview and to obtain more details about the connections students see
between the two areas of their education, the SFA program, and the science classroom. The
second interviews allowed for more data to be gathered and determine if the translation of
experience was occurring as well. The interviews were transcribed and analyzed to find key
words, phrases, and supporting evidence for the SFA program and adventure education in
general. The participants were also asked to create a jot list of autobiographical information that
they might include if they were writing a story about themselves. This information was used in
creating the case study reports for each of the four students.
CHAPTER 4
RESULTS

This section describes the overall themes that emerged from the data collected from the initial vignette, the set of vignettes, and the interviews. The first portion of this section will describe the pattern of the mean scores calculated for all participants for the initial acid rain vignette. The latter portion of the section will describe the specific results for the four selected participants through case studies. The cases will describe the participants and discuss the relationship between the SFA program and the science classroom regarding the second and third questions of the research study. All numerical results are also presented in tables at the end of the section.

Mean Scores for the Initial Acid Rain Vignette

The mean scores of the participants’ responses to the initial vignettes can be applied to answer the first research question, which asks if the students are able to apply their understanding of the respect, trust, communication, and cooperation lessons learned during their participation in an adventure character education program to science learning experiences. All 39 participants included at least one key word or phrase that could be considered an example of something learned in SFA. The averages ranged from a 0.25 to a 2.75 with evident breaks at each quarter from the lowest to highest score. The largest group of students scored an average of 2.25 (which includes eight participants), and only two students scored a 0.5 or lower as shown in Figure 4.1.
The concept of respect scored the highest out of all the concepts with 23 students receiving a score of 3 points and only one student receiving 0 points as shown in Figure 4.2. Communication is the second highest scoring concept with 19 students receiving 3 points and two students earning 0 points as shown in Figure 4.3.
Figure 4.2. Respect mean scores for all participants on the Acid Rain vignette

Figure 4.3. Communication mean scores for all participants on the Acid Rain vignette
Figure 4.4 shows the concept of cooperation falling next in line with 12 students earning 3 points and six students earning 0 points, while Figure 4.5 shows trust to be lowest scoring concept with only three students earning 3 points and eight students receiving 0 points.

Figure 4.4. Cooperation mean scores for all participants on the Acid Rain vignette
The lowest average for the overall participant group was in the trust category with a mean of 1.13, followed by cooperation with a mean of 1.77. The communication concept scored the second highest with a 2.26, leaving the concept of respect in the top position with a 2.38. The overall average for the entire participant group was a 1.88. Students who received scores of 1 point or lower showed little or no evidence of key words or phrases that may have made the transfer from the SFA program to the science classroom. In contrast, students who received a score of 3 points or higher may have included more than three key words or phrases, but the rubric had a limit of only 3 points. Since the acid rain vignette proposed a situation that could actually occur in a science classroom, it can be assumed that evidence of the SFA program found in the students’ written responses shows translation occurring between the two areas.

Figure 4.5. Trust mean scores for all participants on the Acid Rain vignette
The first factor in selecting the four participants was their mean score. The researcher determined it best to include one student from four different levels of the scoring scale with the lowest significant score being a 1.25. Upon deciding the lowest possible mean score to be included, the next level of scoring added 0.5 to the previous mean score break point. This increment allowed for even distribution of the levels and caused the break points to fall within groups that occurred in significant quantities for the overall participant group. Therefore, one student was chosen from the 1.25, 1.75, 2.25, and 2.75 levels and that satisfied the qualifying characteristics as they have been described previously.

Case: Kari

Kari is a thirteen-year-old girl with one older brother who is in college. She and her family are from India, and Kari has lived in the U. S. her entire life. She attends an Indian dance school not associated with the academic school where the research was conducted. Kari likes meeting new people and running on Stone Mountain. She also enjoys drawing and painting abstract art pieces and loves speaking in different languages like Spanish and Indian. Most interestingly, Kari would like to make her own car when she gets older.

Kari is a very talented and confident young lady. She is accepted graciously by all of her classmates but does not allow herself to get caught up in the mischief that can exist in a middle school environment. She is also an involved fine arts student as a part of the orchestra and as a cast member of the middle school play. Swimming fills her need to be physically fit. Her personality is contagious, and she is seen by the faculty and many of her classmates as a true leader. Kari shows promise of great things and a very successful future.

Kari’s mean score for the Acid Rain vignette was a 1.25, scoring low in cooperation (0.67) and trust (0.17), higher in respect (2.17), and even higher in communication (2.83) as shown in Figure 4.6. These results are quite surprising since Kari is such a positive factor overall. In comparison, Kari’s specific vignette mean scores fell on both ends of the scale, with respect and communication being the highest and trust and cooperation falling on the very low
end. In contrast with these results, when she was asked specifically about the key topics of respect, communication, cooperation, and trust during the interview, she was able to provide evidence that she believed she has learned much through SFA this year. Kari explains that she has learned to trust her classmates more this year because the challenges presented in SFA require trust in order to complete them, and she believes she has learned cooperation through increased awareness gained from the communication and respect for her peers required in SFA and science. Consistent with her scores on the specific vignettes, Kari’s responses in the interview were complete with ideas about respect and communication; for example, she says that she has “learned to hear [others’] ideas” before she disregards them, connecting to both key values of respect and communication.

Showing evidence of the translation of experience, Kari explains that trust is necessary during hands-on activities in the science classroom to ensure that no one gets hurt and trust has been built during SFA, specifically during the Chocolate River activity. She responded “[they] had to trust [their] friends to see that they were doing the right things because if they stepped off the . . . marshmallow, then [they] couldn’t trust that they wouldn’t do it again, so [they] had to build [their] trust together.” Kari also describes her entrustment of others and their assistance in helping her understand concepts and makes the connection to the Ready Aim initiative experienced during SFA. She explains that she had to trust her partner and that “what they were doing was right so [she] could pick up the ball and throw it” and compares that to trusting her partner to explain a science concept in the correct way so that she can understand and complete the project. These direct links between the SFA program and the science classroom provide evidence that Kari is making the translation and does recognize the connections even though her written responses do not indicate this idea.

Kari also describes a distinct connection with the active experimentation phase of the ELC when Kari describes performing her talents for the public. She explains that when a person “messes up,” she is there to say “that’s okay” and is shown respect by others as she
shows them respect. She makes a connection to *active experimentation* again with her answer to the question about the part of SFA she gets the most out of by answering, “when I see myself applying it to other areas.” Kari appears to recognize the connections that exist between lessons learned in SFA and other areas of her life, but she was not able to describe any particular “aha” moment when the connection was obvious. Kari’s interview also supplies evidence to support adventure education teachings in that she describes SFA as “really fun” which is a rule included in the FVC. Another idea to consider is Kari’s comment about how SFA activities are “group activities but they’re made as a game or something really fun” implying that, typically, group activities are not enjoyable for Kari. This interpretation is an example of how SFA, and adventure education in general, can provide a different type of experience for people to grow and develop from.

![Kari's Overall Results](chart.png)

**Figure 4.6.** Kari’s overall results for the set of 4 vignettes
Case: Joe

Joe is a thirteen-year-old boy with two older brothers, one in college and the other a senior in high school. He has a dog and enjoys several sports including basketball, football, and skateboarding. Joe hopes to play college basketball and then move on to become a professional basketball player or even a professional skateboarder. In his spare time, he likes to play video games and enjoys making movies with his friends and brothers of them doing “random stuff”. In school, he likes science the most and mathematics least, and he does not like to wake up to come to school.

Joe is a natural leader to his classmates although he does not always make the most appropriate decisions, and his playful, easy-going nature places him in the middle of what might be considered the popular crowd. Joe is a rather intelligent student but may not always perform at his full potential. He is still very much a boy who seems to get into unnecessary mischief, but there are glimpses of his maturity and style that hint at what could be a bright future depending on the path he chooses to take.

Joe’s mean score for his response to the Acid Rain vignette was 1.75 with his lowest scoring area being respect and then communication, cooperation, and trust all tying at the same average. Interestingly, Joe’s respect average (2.83) for the respect vignette was at the highest level for both subcategories based on the researcher’s analysis. Although respect was not a main focus of Joe’s initial writing in the research, the value Joe places on respect is evident not only in his response to the respect vignette but also in his interview. The researcher observed a much more serious, deep-thinking facial expression as Joe talked about respect, and his voice also had a more solemn tone, as if he were recalling certain experiences in which he had learned some hard lessons about respect. This serious persona may also be more apparent to the researcher due to her relationship as the student’s teacher and knowledge of previous events that occurred in the participant’s life; none the less, it is still a significant observation.

Joe’s interview provides direct evidence of the reflective observation phase of the ELC by
saying “just by thinking back on what I have done and . . . it wasn’t respectful or how I could have made it more respectful in the situation” to describe how he felt he has learned more about respect throughout the year.

Trust was the area in which Joe’s mean score was the lowest for the specific vignettes (0.67). It could be interpreted that trust is the area, then, in which more development is needed for Joe. The written response offers only examples of his being trustworthy, but not his entrustment in others, and there is very little of what could be analyzed as acceptable answers. The same could be said of his very, short and matter-of-fact answer to the trust question during the first interview. On the other side of the scoring spectrum, communication appears to be an area of significant development since its mean score occurs at the highest level (2.83). His projection of his thoughts and actions to the communication vignette were filled with positive communication descriptions and intentions that are beneficial in any group situation, specifically the science classroom. He also describes an experiential education scenario in his interview in which he says “being in the situations” allowed him to recognize which friends he could really joke around with and which friends would take it the wrong way. And lastly, cooperation (1.33) falls on the low side of the mean scores as well. Joe’s written response to the cooperation specific vignette shows him to be more willing to ask and accept help from others rather than voluntarily offer it.

Unlike Kari, Joe does not describe the direct connections between a lesson from an SFA experience to a specific science classroom situation. He realizes the connection between the two areas, but is not able to provide specific links. Joe does, however, provide several more key words and phrases that resemble the transfer of knowledge. He talks again about having to “trust in your group members . . . and be willing to divide up the work amongst your group members to make [the project] better”. Joe also describes entrusting others to get the right measurements of items needed to complete the strawberry DNA extraction lab and makes the connection to learning to trust classmates during SFA.
The answers presented by Joe during the interview also revealed a host of examples to connect to different phases of the ELC and adventure education cornerstones. For example, he describes his discovery of “the person who isn’t speaking very loud is sometimes the person with the best idea” and the application of that lesson to a group science project. This is the essence of the active experimentation phase of the ELC. Another mention of active experimentation occurs in his last statement as he says “applying [SFA] has really helped me . . . to everyday life like friends, respect, and stuff”. He also describes some of his actions to be reflective observation as described by the ELC when Joe explains that he really thinks about the challenge on the way into the classroom, before the discussion begins. Joe is also very enthusiastic about the challenges and hands-on activities that SFA provides; he believes it is “something different” that teaches life skills through hands-on activities and challenges that make them think which encompasses the ideas of character, experiential, and adventure education that build the SFA program.

Joe's Overall Results

Figure 4.7. Joe’s overall results for the set of 4 vignettes
Case: Alison

Alison is a twelve-year-old female with a younger brother and sister. She believes she has the “most awesome parents”, and her family includes three cats, one dog, two horses, five goats, and two chickens. Alison’s hobbies are playing the piano, riding horses, and, most outstandingly, dancing—ballet, pointe, and jazz. She enjoys theatre, singing, hanging out with her friends, and using her computer. Her favorite food is artichoke melted in butter, and her favorite sports are soccer and baseball.

Alison is very compassionate and sure of herself. She conducts herself in an exemplary manner and has her own niche of friends that are also compassionate people. She is a genuine leader who seems to be unaffected by the tomfoolery of middle school life. Alison is an intelligent student with a great work ethic and drive to succeed. Her passion and enthusiasm for life are contagious, and she is not afraid to speak her mind or stand up for herself.

Alison’s mean score for the Acid Rain vignette was a 2.25 with her lowest score in the area of cooperation and high scores in respect and communication. Alison’s responses to the specific vignettes all averaged in the middle to high side of the scale, and the same pattern is evident in her interview responses as well. Alison’s lowest mean score in regard to the specific vignettes was also cooperation (1.5), consistent with her response to the acid rain scenario. Alison’s resistance to cooperation is hinted at in her written response by her repeated mentioning of “working alone” and the negative undertones felt when she describes her ideas about working with a group. Her resistance is also directly addressed in the response to the interview questions about cooperation because she admits it has “been a lot harder for [her] to learn about and try to use,” but also that SFA has helped in that the “different building activities” and “work with [her] other classmates helps”.

In the other three areas under investigation, respect (2.83), trust (2.17), and communication (2.83), Alison seems to better grasp the relationship between SFA and other parts of her everyday life. Although she does not reference a specific activity regarding respect
and SFA, she is quite adamant that the activities have contributed to her “understand[ing] what other people are saying and respect them for their ideas and opinions”. Alison’s comprehension of the connections between SFA, the science classroom, and other parts of life is continued with her ability to provide specific SFA activities in which she experienced and developed an attribute. When asked about trust during the interview, she immediately references the Ready Aim activity which encourages participants to trust their partners to lead them blindly to ammunition to fire at other participants. Evidence of Alison’s work to better entrust in others is also seen in the written response to the trust vignette since she writes several phrases like “I would really try to trust my group mates” and “I would just have to hope and trust”. Alison also brings up the Chocolate River activity in which it is a necessity for students to communicate in order to complete the challenge. With this recognition, she also adds that she “think[s] communication has been a big topic” of the program focus.

Alison makes direct connections between the science classroom and SFA by explaining that “listening and communication is . . . especially important in science” and not just listening to the teacher but communication and listening to each other to ensure the experiment is done correctly to make sure something dangerous does not happen. Alison implies that building those aspects of communication and trust between classmates happens during SFA. Like Joe, Alison does not describe any direct recognition between specific experiences, but she does understand the connections between SFA experience and science classroom application of those experiences.

Alison also provides quite a few different ties to the ELC and adventure education as well. She acknowledges that she uses what she has learned in SFA each day in “talking to [her] friends and trusting that secrets will be kept” which is active experimentation. She also provides an example of reflective observation before the question dealing with that topic is even asked which illustrates her thoughts during and after an activity:
I really like doing games . . . At first when we start doing the game, you don’t think that this is Skills for Adolescence, you just think of it as a fun game day, but then once we talk about it afterwards, then you realize, oh wait, this is for a strengthening activity.

Another example of reflective observation in Alison’s information is her description of the way she gets the most out of SFA; she describes the moments when she realizes the lessons learned from the activity during the discussions at the end of class. For her, it is not during the experience because she is too caught up in being successful to see the bigger picture. She also offers an endorsement for adventure and experiential education when she is asked to describe what she likes most about SFA:

“ . . . being able to hang out with my friends and doing games and stuff instead of just sitting there and talking, so we actually get to do something that . . . builds our character but it’s still like a fun environment.”

Alison seems to truly love and benefit from all the program has to offer, including the disguised way it can improve a person’s character and help people grow without knowing it.

![Alison's Overall Results](image)

**Figure 4.8.** Alison’s overall results for the set of 4 vignettes
Case: Beau

Beau is a twelve-year-old boy who recently moved to the southeast region of the United States from North Dakota. He has had to make the switch from ice hockey to roller hockey and also plays baseball. He has one older brother, two dogs, and one cat. Beau collects the state quarters, plays the trombone and the piano, and likes any type of music except country. He also enjoys fishing, swimming, and playing basketball and tennis for fun.

Beau is quite an intelligent young man with quick wit; he is the student that catches the teacher’s sarcasm when it goes over everyone else’s head. He was a very quiet and shy boy when he entered the class at the beginning of this academic year but has broken out of his shell and grown into his own amongst his peers. Beau brings a fresh perspective to the school and the SFA program since he is a recent addition. He, much like Kari and Alison, manages to stay out of the jumble that middle adolescence can sometimes bring. Beau is a very well-rounded individual with an array of talents to offer to everything around him.

Beau’s average for the Acid Rain vignette was 2.75, falling into the highest group of scores for the participants. He received 3’s in all areas except cooperation in which he received a score of 2 based on only the researcher’s analysis. Interestingly, Beau’s score is the second lowest for cooperation amid the four participants at the center of the in-depth research. His written response paints him to be very independent and self-oriented in academics. His competitive nature also shows through in wanting his work to be the best and in believing that persuading others to believe his opinion during a discussion wins the argument which is explained in his written response to the respect vignette. Beau’s score is low in the respect (1.3) category despite his including respectful descriptions; it is feasible to interpret that he does not understand all components of respect if he is trying to sway others to his side rather than being satisfied that they hold a differing opinion.

In spite of the previous analysis, Beau appears to recognize the connections between SFA, science, and other parts of his life, because he, like Alison, brings up specific activities
from the adventure program. For example, he talks about the Chocolate River activity and the cooperation needed for the class to move from marshmallow to marshmallow to complete the challenge presented to them. He also mentions the times when he believes the development of communication is critical. He describes that added obstacles or consequences like “no talking” make the activity even more challenging and provide the opportunity to “get better as a class.”

Beau’s overall mean score for communication was a 2.

Trust (2.17) uncovers itself as a major issue for Beau, but not in a negative way, it is his highest mean score for the four specific categories. In another part of the interview process, Beau mentions the Trust Fall that will occur later in the year as the culmination of the trust sequence. Beau is the only student of the four to mention anything about the activities planned for the future or to legitimately put his trust in his peers, not just his friends, into writing in response to the trust vignette or into words during the interview. Another interesting point is Beau’s mention of the Honor Code that exists within the school. The Honor Code is pledge the students and faculty make to one another not to “lie, cheat, steal, or plagiarize”, and its purpose is to hold everyone accountable for their actions and provide a very safe environment that allows for optimal education. Beau directly connects his trust of others now, in his present situation, to his experiences with the Honor Code and activities in SFA. When asked how he knows he can trust others, he responds by saying “. . . because they’ve done good things in the past”. Because the optimal learning environment provided for Beau, particularly the Honor Code and the SFA program, is so new, the effects are still very evident in his mind, where as the shine of the environment has worn off for others.

Beau, like Joe and Alison, does not describe any specific account of the SFA experience that translates to the science classroom. His second interview provides more explanation of ideas he has already explained, and it provides examples of the application of SFA lessons of respect, communication, cooperation, and trust to science situations. However, the specific recognition that Kari was able to provide does not exist within Beau’s responses.
Beau also joins the others in providing descriptions of connections to the ELC. Specifically, he explains that “you gain trust [during SFA] and you get to know more about other people, so you apply it to your life then” which describes the active experimentation phase. Beau also provides an example of reflective observation in saying that the discussion part of the program that occurs after the actual activity is the part he feels he gets the most out of; that is when he pays attention to the lessons behind the challenges. It becomes evident in his writing and during the interview that SFA, in addition to the Honor Code, were big factors in Beau establishing himself and becoming comfortable within his new surroundings this year although his scores for the specific vignettes were analyzed at a lower level than the responses to the initial vignette.

![Beau's Overall Results](image)

Figure 4.9. Beau’s overall results for the set of 4 vignettes
Connections between the ELC and Respect, Communication, Cooperation, and Trust in the SFA Program

<table>
<thead>
<tr>
<th>Concept</th>
<th>Concrete Experience</th>
<th>Reflective Observation</th>
<th>Abstract Conceptualization</th>
<th>Active Experimentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respect</td>
<td></td>
<td>All students describe this occurring during discussions of SFA activities</td>
<td>Kari’s example of supporting others during her public performance</td>
<td></td>
</tr>
<tr>
<td>Communication</td>
<td>Chocolate River</td>
<td>All students describe this occurring during discussions of SFA activities</td>
<td>Chloe’s examples of communication being key to maintaining safety in the science classroom</td>
<td></td>
</tr>
<tr>
<td>Cooperation</td>
<td>Chocolate River</td>
<td>All students describe this occurring during discussions of SFA activities</td>
<td>Joe’s projection of working with others during the monsters project</td>
<td></td>
</tr>
<tr>
<td>Trust</td>
<td>Ready Aim</td>
<td>All students describe this occurring during discussions of SFA activities</td>
<td>Beau’s overall trust in others because of his experience in SFA</td>
<td></td>
</tr>
</tbody>
</table>

Figure 4.10. Connections chart showing examples of the four key concepts and the ELC
CHAPTER 5
DISCUSSION AND IMPLICATIONS

The results of this investigation imply that participants in the SFA program did make translations between the lessons learned during SFA activities and the science classroom. This conclusion is made because the results indicate that some students did not make the connections between the two aspects of their education. Little or no evidence of key words or phrases about the four characteristics being studied was identified in the students’ written responses, which provides the disconfirming evidence needed to establish the pattern of translation. Erickson (1986) describes the pitfalls that can occur in collecting and applying qualitative data as inadequacies of evidence. One of the major points stemming from this is that the exception proves the rule; in application for this study, the lack of translation by some students proves that translation is actually occurring for others that can be credited to the SFA program. Another inadequacy identified by Erickson (1986) is the “faulty interpretive status of evidence” which means the researcher “fails to have understood the key aspects of the complexity of action or meaning perspectives held by actors in the setting” (p. 140). This may happen when the researcher does not spend enough time with or was not intense enough in dealing with key components of study or could even occur when participants lie about or fake responses because they do not trust the researcher or agree with the researcher’s goals. This aspect can be disregarded in this investigation since the researcher is both the SFA facilitator and science teacher for the participants in the study. Therefore, there is an established relationship of trust between the researcher and participants that allows the participants to respond honestly and openly and to believe that the researcher is attempting to improve the program for the students.
After ensuring that the inadequacies identified by Erickson (1986) have been addressed, the real significance of the data can be discussed in detail. The overall results from the written responses to the initial vignettes by all participants, the written responses to the set of four vignettes by the four selected students, and the data collected from the interviews suggest that cooperation and trust are characteristics that need better development since there is a lack of evidence of connections with these two themes between the two areas of education. This may be due in part to the fact that the students have not fully completed the 7th grade SFA program, and therefore, have not actually been able to experience the activities that aid in developing these areas to the highest potential this year. It is also reasonable that respect and communication were more common in the responses since those characteristics are focused on during the first half of the year since they provide a basis to establish cooperation and trust within the participants. With these aspects in mind, any future studies that wish to incorporate trust and cooperation should be conducted after completion of the 7th grade year in order to obtain accurate data.

In reviewing all data from the investigation, it is apparent that adventure character education has a positive influence on the science classroom experience, which answers the main research question of the investigation. The majority of students provided evidence that translation of knowledge from the adventure area of their education to the science classroom area of their education does occur and aids in providing an optimal learning environment. This evidence is seen in the overall group responses to the initial vignette and most definitely in written responses and interview answers provided by the four selected students. The data collected from the four students provides the evidence needed to answer the first sub-question regarding the application of their understanding of respect, communication, cooperation, and trust to their science classroom experience. It illustrates students' definite transfer of experience and lessons from one realm of their education to the other. The students describe direct connections between the two, providing specific examples of how they have applied what
they have learned about the four key concepts of this investigation during SFA to types of situations particular to a science classroom. The second sub-question is answered by the data collected throughout the interviews. With regard to recognition of the connections, the students do realize the link between the two areas but may not be able to articulate specific, direct links between part of SFA and the science classroom. This may be because the students are not able to convey their thoughts completely accurately or because they generalize their experiences rather than recognizing the “aha” moment connections.

In trying to contribute concrete information to the field of adolescent adventure education, Hamilton’s (1979, 1980) experiential education evaluation is also being applied to this study. He believed that studying the how rather than finding out the effects was more valuable for the education programs. Hamilton’s (1979) four-tiered hierarchy of questions of research questions progress from the least convincing to the most compelling evidence. The four tiers are: (a) Do participants say they have been affected? (b) Is there other evidence of effects? (c) Is there evidence that the program was responsible for the effects? And (d) What about the program was responsible for the effects? Not all the questions are answered by the design of this study, but this heuristic study does set the foundation for more in-depth investigation in the future. The first tier of hierarchy is answered by the students’ responses to the interview questions because they openly admit that the lessons learned in SFA have been applied to and affect not just their everyday lives, but their science classroom experiences as well. The interview responses also provide some evidence to answer the third question because the selected students make direct references to specific activities completed in SFA that helped them in other situations. The next level of research based on Hamilton’s (1979) experiential education evaluation should investigate not just participant descriptions but also parent and instructor assessments and should go on to directly give credit to participation in the experiential education program under investigation. Once these ideas are discovered and
established, then the separate components of the program should be studied and their effects measured.

In comparing this research investigation to others already conducted, this research takes data one step further by making connections between the effects and outcomes to a specific theory. Rather than just searching for the outcomes or the effects of the SFA program, it establishes research regarding the process of how those lessons are learned by the participants. This is done by labeling descriptions or phrases as one of the phases of the ELC: concrete experience, reflective observation, abstract conceptualization, and active experimentation. This research attempts to design an investigation that does not rely on “folk pedagogies” which are often “highly idiosyncratic, lack specificity, and rarely provide direct implications for measurement”, but instead rises to the demand made by Baldwin, et al. (2004) in their paper titled The Role of Theory, Research, and Evaluation in Adventure Education. This research also joins previous studies in reporting positive effects due to participation in an adventure education program; however, this report looks at the development of respect, communication, cooperation, and trust as the focus of the study.

There are several possible limitations for this research. First, choosing written responses to be collected from 7th grade students may not be the best way to ascertain their true responses. Also, analyzing these types of responses includes some interpretation of answers that may not always be correct. Also, for this study in particular, the researcher was a novice interviewer and was not the most effective in retrieving thorough answers and explanations from the participants which is evident in reviewing the transcriptions of the interviews. Other limitations include the students’ understanding of what was needed as a response to the vignettes; however, being vague was somewhat necessary so as not to influence the participants’ natural thinking. Another limitation was whether or not all participants were completely honest in describing their thoughts and intentions. This concern was
addressed for the four students selected to continue the research but not for the group as a whole.

In making suggestions for future research on adolescent adventure education programs, the researcher suggests exploring the effects of the individual components of the program to determine what makes it “click” for the students. This can be done not only by revealing connections between evidence and theory, but also by researching particular parts of the experiential process like the planning, the discussions, or by looking at other adventure models. Programs should also be evaluated in a holistic manner that investigates all areas of a participants’ moral education. The ultimate goal of this research was to begin the investigation into the SFA program and its influences in other areas of the students’ lives based on Kolb’s ELT.
REFERENCES


APPENDICES

Appendix A

Acid Rain Project
Inspired by a webquest from Computer Integration Activities

Introduction
Why are plants dying? How come there are dead fish in the lake? Why does the paint on my mom’s SUV look so dull now? And what is that awful smell in the break area sometimes? Acid rain is the answer. It is to be blamed for so many of our environmental issues today. Finding a way to clean up our waterfall is not an easy task.

The Task
Ogeechee County has hired you and a few other researchers to investigate acid rain. You and your group members will take on the jobs of chemists, biologists, health scientists, and economists. You will research information about acid rain based on your area of expertise. If you’re the chemist, you’ll search for the chemistry behind acid rain; if you’re the health scientist, you’ll search for the health issues associated with acid rain, and so on. You will work with this group to complete an information pamphlet that can be given to community members that details problems caused by acid rain and recommending ways that these problems can be lessened. Each member will provide the information for his area of concern (chemistry, biology, health, or economy) and is also responsible for writing that portion of the pamphlet.

You and your group members will decide who is going to become the different “experts”, each of you should assume a different job. After deciding upon this, each of you should use the questions listed below to help you with your research. You are not only responsible for answering the questions in your section, but you are also responsible for offering recommendations to the county that you, along with your group members, have decided would be good steps to take to alleviate acid rain.

(For the purposes of this research project, choose one of the following jobs and read the questions so that you understand the amount of work needed to complete the assignment.)

CHEMIST

• What is acid rain?
• What chemicals make rain acidic, and how does it happen?
• Where do these chemical come from?
• How do we measure the acidity of rain?
• What is ph?
• Describe the ph range and list various things that correspond to the various ph levels.
• What is the ph of normal rain, and at what level does the ph become dangerous?

BIOLOGIST
- What effect does acid rain have on trees and soil?
- How does the effect of acid rain on trees and soil affect us?
- What happens when lakes and aquatic systems become acidic?
- How do acidic water systems affect us?
- Are the aquatic systems in our area being affected by acid rain? If yes, to what extent?
- What are the danger signs of the effect of acid rain on aquatic systems?

**HEALTH SCIENTIST**

- How does acid rain affect humans?
- What are some of the direct effects of acid rain on humans? Are there any health problems associated with acid rain?
- What are some of the indirect effects of acid rain on humans? Does acid rain affect our sources of food, water, and air?
- What are the consequences of the effects of acid rain on people?

**ECONOMIST**

- Does acid rain affect building materials?
- Does acid rain have an effect on architecture?
- What does acid rain do to our roads, highways, and bridges?
- What is the effect of acid rain on things made from metal such as automobiles, trains, buses, and other means of transportation?
- What does the effect of acid rain cost us in terms of money?
- What are the economic consequences of acid rain on fisheries, forestry, and agriculture?

Do not forget to look for solutions to the problems that cause acid rain while you are researching your area of expertise. Remember, the final part of your pamphlet needs to include recommendations for the county, although they will be from the entire group, you will need to be prepared to offer your own input about your specific area of concern.

Your teacher has given you this assignment and placed you in a group with three (3) other students from your class. She tells you that the group has two (2) weeks (ten (10) class days) to complete their finalized pamphlet to turn in for a test grade. You will be turning in one (1) pamphlet for the entire group which will be graded and each member of the group will receive the same test grade.

As you and your group begin to read through the requirements of the project, two (2) members of the group really want to become the expert biologist. The group decides to flip a coin to decide who will take on the roll of biologist. The coin falls in Laura’s favor making her the biologist and Ben the economist. Ben is not happy about the decision and makes several comments throughout the first week about his dissatisfaction with being the economist. Ben even lost his laptop privileges for two (2) days for playing a game during class while he should have been researching.

At the end of class on the sixth day of the project, the group decides to check in with each other’s progress. The group discovers that Ben has completed very little work and is not prepared to start writing his portion of the pamphlet while all the other members have answered all questions and are ready to begin writing. The group is very upset by Ben’s actions since the entire group’s grade depends on the quality of the final packet.
Explain in detail what you believe your thoughts would be in this situation. Write down everything you can think of like how you would feel and what actions you think you might take in this situation. Put yourself into the different characters of this scenario and write from different perspectives as well. Also, include an explanation as to why you believe you would feel the way you do and explain why you may respond the way you have described. No answer is a wrong answer, so be as honest and truthful as you can when writing your answer down.
Appendix B

Evolution vs. Intelligent Design

Scenario

On a Wednesday during science class, your teacher began to discuss the structures of different types of organisms and how they relate to each other. For example, how a bird’s wings could match up to a person’s arms or the fins on a dolphin. The teacher begins to talk about how species change based on their surroundings when another student in the class raises his hand and asks, “What is evolution? I’ve heard a lot about it, but I don’t really know what the big deal is with it and creationism or whatever.”

Your teacher realizes the opportunity for a teaching moment and wants to have a class discussion, so she urges the class to contribute their thoughts and opinions about the topic. Quickly, another student in the class chimes in, “Evolution isn’t right, God made everything.”

Your teacher still wants to continue with the discussion so she further persuades students for contributions to add to the discussion. Some students state they do not really understand what each topic means and that they need further explanation. The teacher asks one student to look up the definition for evolution and another student to look up the definition for intelligent design.

The student reports that evolution is a change in something that usually changes it for the better. The teacher goes on to clarify it as a theory in science teachings of how organisms naturally change on their own from something simple to their complex forms today. By now, the other student is ready to report intelligent design as being another theory that the stuff in the universe was created by an intelligent being rather than by chance or through natural processes.

Naturally, this starts a very long and opinionated discussion in the classroom amongst the students who have different beliefs on this topic. Some students are interrupting classmates in the middle of comments while others are making comments underneath their breath about what other students are saying. The teacher has warned about the behavior in the classroom and towards each other if the class wants the discussion to continue.

Explain in detail what you believe your thoughts would be in this situation. Write down everything you can think of like how you would feel and what action you think you might take in this situation. Also, include an explanation as to why you believe you would feel the way you do and explain why you may respond the way you have described. No answer is a wrong answer, so be as honest and truthful as you can when writing your answer down.

Remember, I am not asking how you feel about evolution or intelligent design, I want to know what you believe your thoughts, feelings, and behaviors might be in relation to the tone of the classroom.
## Appendix C

### Respect Rubric

<table>
<thead>
<tr>
<th></th>
<th>Self-respect</th>
<th>Respect for Others</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A lot (3)</strong></td>
<td>3 or more pieces of evidence that relate to self-respect; the evidence may be specific words or what the analyst considers an explanation of self-respecting acts, intentions, or thoughts (3)</td>
<td>3 or more pieces of evidence that relate to respect for others; the evidence may be specific words or what the analyst considers an explanation of acts, intentions, or thoughts that show respect for others (3)</td>
</tr>
<tr>
<td><strong>A little (2)</strong></td>
<td>2 pieces of evidence that relate to self-respect; the evidence may be specific words or what the analyst considers an explanation of self-respecting acts, intentions, or thoughts (2)</td>
<td>2 pieces of evidence that relate to respect for others; the evidence may be specific words or what the analyst considers an explanation of acts, intentions, or thoughts that show respect for others (2)</td>
</tr>
<tr>
<td><strong>Not much (1)</strong></td>
<td>1 piece of evidence that relates to self-respect; the evidence may be specific words or what the analyst considers an explanation of a self-respecting act, intention, or thought (1)</td>
<td>1 piece of evidence that relates to respect for others; the evidence may be specific words or what the analyst considers an explanation of an act, intention, or thought that shows respect for others (1)</td>
</tr>
<tr>
<td><strong>Nothing (0)</strong></td>
<td>No evidence that relates to self-respect or what the analyst could consider an explanation of self-respecting acts, intentions, or thoughts (0)</td>
<td>No evidence that relates to respect for others or what the analyst could consider an explanation of acts, intentions, or thoughts that show respect for others (0)</td>
</tr>
</tbody>
</table>
Appendix D

Humpty Dumpty sat on a wall... Humpty Dumpty had a great fall... 

Materials
✓ 3 ft. of masking tape
✓ 1 piece of poster board
✓ 2 pieces of construction paper
✓ 2 cotton balls
✓ 1 egg

Challenge
You and 3 other students (4 students in a group chosen by the teacher) are challenged to build a container that will protect a raw egg during a 50 foot drop and landing! You are only allowed to use the materials listed above. You are only allowed to have 1 set of materials, so be careful not to make mistakes! You will not be allowed any practice drops!

Everyone in the group must contribute an idea or thought as to how your container may be built to keep your Humpty Dumpty safe during its plunge to the pavement. Also, everyone must take part in constructing your egg container. You will have 4 school days to construct your contraption, and on the fifth day we will test your designs by dropping them from the top of the bleachers in the gymnasium.

Your group needs to keep a journal of everything you do while making decisions as a group. Keep any brainstorming lists, drawing plans, or lists of tasks that each group member is in charge of. Anything your group does that you might consider evidence of group planning and decision making should be kept during the assignment.

Your grade on this assignment will be based on several different aspects as listed below:

- 10% based on egg survival
- 50% based on your group members evaluation of you
- 20% based on your self-evaluation
- 20% based on your group evidence of planning

Here are examples of what the evaluations might look like:

Self-evaluation – Circle the number you feel best fits each category.

<table>
<thead>
<tr>
<th>I worked with all members of the group</th>
<th>Very well (5)</th>
<th>Fairly Well (4)</th>
<th>Somewhat well (3)</th>
<th>Not well (2)</th>
<th>Poorly (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I contributed to the designing and building of the container</td>
<td>Very well (5)</td>
<td>Fairly Well (4)</td>
<td>Somewhat well (3)</td>
<td>Not well (2)</td>
<td>Poorly (1)</td>
</tr>
</tbody>
</table>
Group Member Evaluation – Circle the number you felt best fits each category for the group member you are evaluating.

Name of Group Member: ___________________________

<table>
<thead>
<tr>
<th></th>
<th>Very well (5)</th>
<th>Fairly Well (4)</th>
<th>Somewhat well (3)</th>
<th>Not well (2)</th>
<th>Poorly (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Worked with all members of the group</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contributed to the designing and building of the container</td>
<td>Very well (5)</td>
<td>Fairly Well (4)</td>
<td>Somewhat well (3)</td>
<td>Not well (2)</td>
<td>Poorly (1)</td>
</tr>
<tr>
<td>Assisted in the organization of our planning</td>
<td>Very well (5)</td>
<td>Fairly Well (4)</td>
<td>Somewhat well (3)</td>
<td>Not well (2)</td>
<td>Poorly (1)</td>
</tr>
</tbody>
</table>

Explain in detail your thoughts about how you would try to communicate with the members of your group to ensure that your group was successful during this assignment. Write down how you think you would feel and what you believe your actions might be during this experiment. Also, include why you believe you might respond the way you describe. No answer is a wrong answer, so be as honest and truthful as you can when writing your answer down.

Remember, I do not want you to tell me about the container you would build or how you feel about grading, or things like that. I want to know what you think you would do in order to complete the assignment. How would you work with your group to organize tasks? How would you decide what ideas to use? How would you contribute to the group?
<table>
<thead>
<tr>
<th></th>
<th>Listens to other members of the group</th>
<th>Able to provide clear explanation of thoughts and feelings to other members of the group</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A lot</strong> (3)</td>
<td>3 or more pieces of evidence that relate to listening to others; the evidence may be specific words or what the analyst considers an explanation of listening acts, intentions, or thoughts (3)</td>
<td>3 or more pieces of evidence that relate to clear explanation of thoughts and feelings to others; the evidence may be specific words or what the analyst considers a description of acts, intentions, or thoughts that clearly explain a person’s thoughts and feelings (3)</td>
</tr>
<tr>
<td><strong>A little</strong> (2)</td>
<td>2 pieces of evidence that relate to listening to others; the evidence may be specific words or what the analyst considers an explanation of listening acts, intentions, or thoughts (2)</td>
<td>2 pieces of evidence that relate to clear explanation of thoughts and feelings to others; the evidence may be specific words or what the analyst considers a description of acts, intentions, or thoughts that clearly explain a person’s thoughts and feelings (2)</td>
</tr>
<tr>
<td><strong>Not much</strong> (1)</td>
<td>1 piece of evidence that relates to listening to others; the evidence may be specific words or what the analyst considers an explanation of a listening act, intention, or thought (1)</td>
<td>1 piece of evidence that relates to clear explanation of thoughts and feelings to others; the evidence may be specific words or what the analyst considers a description of an act, intention, or thought that clearly explains a person’s thoughts and feelings (1)</td>
</tr>
<tr>
<td><strong>Nothing</strong> (0)</td>
<td>No evidence that relates to listening to others or what the analyst could consider an explanation of listening acts, intentions, or thoughts (0)</td>
<td>No evidence that relates to clear explanation of thoughts and feeling to others; or what the analyst could consider a description of acts, intentions, or thoughts that clearly explain a person’s thought and feelings (0)</td>
</tr>
</tbody>
</table>
Appendix F

Crazy Monsters, Inc.
Introduction
You have just been chosen as the newest employee of Gisney Jixar Movie Studios! Their most recent project is to create the sequel to their best selling movie Crazy Monsters, Inc. The new movie will be called Crazier Monsters, Inc., and the boss has decided the movie needs a new main character.

Task
The boss wants his employees to design their own new monsters; the best monster will be the new main character in the sequel movie. The boss wants you to be able to describe the genotype of your monster and the genotypes of the monster’s parents. He wants you to be able to describe the phenotypes of the monster and its parents as well. The boss also wants you to sketch a picture of each of the 3 monsters and build a replica of each of the 3 monsters to show the phenotypes to give him a better idea of what the monsters would really look like.

Use the knowledge you recently learned during your genetics unit to create a possible new main character for the movie. Remember, genotype is the genetic makeup of an organism, and the phenotype is what the organism looks like. If you are creating a monster and its parents, then the genetics between them should match up in some way. You may include things like dominant and recessive traits, co-dominant characteristics, incompletely dominant traits, or even sex-linked traits. You can let your imagination run wild!!

Rules

1. You may use any materials that are student craft supplies (glue, construction paper, poster board, markers, colored pencils, pipe cleaners, etc.) within the classroom.
2. You may only use two articles of material that you already have at home.
   a. A piece of felt = one article
   b. Popsicle sticks = one article
3. You may NOT spend more than $5 dollars on new supplies from the store.
4. You may collaborate with other students on or for ideas, but the final drawings and replicas of the monsters must be created on your own.

You will have 7 school days to complete this assignment. Your grade will be based on the effort your finished products show.

Explain in detail what you believe your thoughts might be while completing this assignment. Write down how you think you would feel and what you believe your actions might be during this experiment. Also, include why you believe you might respond the way you describe. No answer is a wrong answer, so be as honest and truthful as you can when writing your answer down.

Remember, I do not want you to do the project or tell me how you feel about creating a monster. I want to know how you would go about completing this assignment. Would you get help from others? Would you work alone? Would you try to help others?
### Appendix G

#### Cooperation Rubric

<table>
<thead>
<tr>
<th>Offers assistance or information to others</th>
<th>Accepts assistance or information from others</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A lot</strong> (3)</td>
<td></td>
</tr>
<tr>
<td>3 or more pieces of evidence that relate to a person offering assistance or information; the evidence may be specific words or what the analyst considers an explanation of acts, thoughts, or intentions of offering assistance or information to others</td>
<td>3 or more pieces of evidence that relate to a person accepting assistance or information; the evidence may be specific words or what the analyst considers an explanation of acts, thoughts, or intentions of accepting assistance or information from others</td>
</tr>
<tr>
<td><strong>A little</strong> (2)</td>
<td></td>
</tr>
<tr>
<td>2 pieces of evidence that relate to a person offering assistance or information; the evidence may be specific words or what the analyst considers an explanation of acts, thoughts, or intentions of offering assistance or information to others</td>
<td>2 pieces of evidence that relate to a person accepting assistance or information; the evidence may be specific words or what the analyst considers an explanation of acts, thoughts, or intentions of accepting assistance or information from others</td>
</tr>
<tr>
<td><strong>Not much</strong> (1)</td>
<td></td>
</tr>
<tr>
<td>1 piece of evidence that relates to a person offering assistance or information; the evidence may be specific words or what the analyst considers an explanation of an act, thought, or intention of offering assistance or information to others</td>
<td>1 piece of evidence that relates to a person accepting assistance or information; the evidence may be specific words or what the analyst considers an explanation of an act, thought, or intention of accepting assistance or information from others</td>
</tr>
<tr>
<td><strong>Nothing</strong> (0)</td>
<td></td>
</tr>
<tr>
<td>No evidence that relates to offering assistance or information or what the analyst could consider an explanation of acts, intentions, or thoughts of offering assistance or information to others</td>
<td>No evidence that relates to accepting assistance or information or what the analyst could consider an explanation of acts, intentions, or thoughts of accepting assistance or information from others</td>
</tr>
</tbody>
</table>
Appendix H

DNA . . .

Materials
- Card stock paper
  - One of each color – blue, red, yellow, green, and black
- Glue
- Scissors
- Markers
- Pipe cleaners
- Yarn

Task
Your group must build a flat model of DNA and an RNA strand. The DNA strand must be at least 6 base pairs long and the RNA strand must be able to match up with one side of the DNA strand. Your group may use creativity in building the model, but must follow the rules for how base pairs match up in DNA and RNA. Each of the 5 possible nitrogen bases must look different than the others, and the backbones for the DNA and RNA strands must look different as well.

You may use any resources you have access to (textbook, internet, handouts, etc) to help you build the model.

Each part of the model must be labeled correctly and be in the right places to receive full credit for the assignment.

Your teacher gave you this assignment at the beginning of class on Friday and assigned your class to groups. Unfortunately, your group took too much time planning what the models should look like, so the group did not finish building the model during class time. The teacher has granted your group permission to work on the assignment over the weekend which means that you will have to split up the tasks of making the different parts of the model. Since there are three members in your group, you each decide to take a strand home to finish; the other two members in the group split the DNA strand while you take on the task of making the RNA strand. Your group had enough time to organize the order of the DNA nitrogen bases that you will follow to build the models, and you had enough time to gather the needed materials. Now, it’s just a matter of actually completing the building of the model on your own at home over the weekend.

Explain in detail what you believe your thoughts would be in this situation. Write down everything you can think of like how you would feel and what action you think you might take in this situation. Also, include an explanation as to why you believe you would feel the way you do and explain why you may respond the way you have described. No answer is a wrong answer, so be as honest and truthful as you can when writing your answer down.

Remember, I do not want you to tell me how you feel about DNA or building the model. I want to know how you would feel about having to split the work up and take it home to finish it. Do you believe your group members will finish the assignment? Are you worried they may not? Are you worried about your grade? Are you worried about how you’ll complete your part?
## Appendix I

### Trust Rubric

<table>
<thead>
<tr>
<th>Trust Rubric</th>
<th>Being Trustworthy – others ability to trust in a person</th>
<th>Entrustment – person’s ability to put trust in others</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A lot</strong></td>
<td>3 or more pieces of evidence that relate to being trustworthy; the evidence may be specific words or what the analyst considers an explanation of trustworthy acts, intentions, or thoughts (3)</td>
<td>3 or more pieces of evidence that relate to entrustment; the evidence may be specific words or what the analyst considers an explanation of entrusting acts, intentions, or thoughts (3)</td>
</tr>
<tr>
<td><strong>A little</strong></td>
<td>2 pieces of evidence that relate to being trustworthy; the evidence may be specific words or what the analyst considers an explanation of trustworthy acts, intentions, or thoughts (2)</td>
<td>2 pieces of evidence that relate to entrustment; the evidence may be specific words or what the analyst considers an explanation of entrusting acts, intentions, or thoughts (2)</td>
</tr>
<tr>
<td><strong>Not much</strong></td>
<td>1 piece of evidence that relates to being trustworthy; the evidence may be specific words or what the analyst considers an explanation of a trustworthy act, intention, or thought (1)</td>
<td>1 piece of evidence that relates to entrustment; the evidence may be specific words or what the analyst considers an explanation of an entrusting act, intention, or thought (1)</td>
</tr>
<tr>
<td><strong>Nothing</strong></td>
<td>No evidence that relates to being trustworthy or what the analyst could consider an explanation of trustworthy acts, intentions, or thoughts (0)</td>
<td>No evidence that relates to entrustment or what the analyst could consider an explanation of entrusting acts, intentions, or thoughts (0)</td>
</tr>
</tbody>
</table>
Appendix J

Interview Questions

1. Do you believe you learned more about (1) respect, (2) trust, (3) communication, and (4) cooperation throughout the year?

(When? Where? How?)

(Do you feel as though you are applying what you’ve learned in SFA to other parts of your life other than SFA? If so, can you give me an example.)

2. Do you believe there have been moments when you made a connection between a lesson you learned in SFA and other parts of your life, specifically during something in science class?

(What made you realize the connection between the two?)

3. How do you feel about the SFA program?

4. What do you like most about SFA?

OPTIONAL

5. What part of SFA do you think you get the most out of, for example, is it when you are trying to complete the challenge I give you, is it when we talk about it after class, or is it when you see yourself applying it to other areas?
Appendix K

Examples of Full Value Contracts

- Every Full Value Contract must include
  1. Be Safe
  2. Be Fair
  3. Be Here
  4. Have Fun

SFA FVC Example 1

- Honesty
- Appreciative
- Trust
- Respect
- Cooperate
- Good Attitude
- Citizenship
- Responsible
- Caring
- Kind Language

SFA FVC Example 2

- Trust
- Work Hard
- Don’t Stop Believing
- Cooperate
- Open-minded
- Be Kind
- Speak Your Mind
- Selfless
- Leadership