AN EXAMINATION OF TWO DIFFERING EXPERIENTIAL APPROACHES TO ALL-TERRAIN VEHICLE (ATV) SAFETY TRAININGS AMONG YOUTH IN OKLAHOMA

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AN EXAMINATION OF TWO DIFFERING EXPERIENTIAL APPROACHES TO ALL-TERRAIN VEHICLE (ATV) SAFETY TRAININGS AMONG OKLAHOMA YOUTH

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Title of Study: AN EXAMINATION OF TWO DIFFERING EXPERIENTIAL APPROACHES TO ALL-TERRAIN VEHICLE (ATV) SAFETY TRAININGS AMONG OKLAHOMA YOUTH

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Abstract: Each year in the United States, hundreds of fatalities and thousands of accidents are reported related to all-terrain vehicle (ATV) usage. Youth are considered an especially at-risk population, predominantly children 16 years of age or younger, because they tend to ride without helmets or safety gear, carry passengers, ride on public roads and/or highways, and operate machines much too large and powerful for their size. This study examined two types of experiential approaches to ATV safety trainings: (a) an interactive training conducted at the Oklahoma Wildlife Expo, which included both a classroom segment and a riding segment, and (b) a school-based training, which included a PowerPoint presentation, coupled with static demonstrations using both youth- and adult-model ATVs and safety equipment, and a short film. Kolb's (1984, 2015) experiential learning theory served as the theoretical framework for this study.

A non-experimental, one-group survey research design was utilized to examine youth 10-18 years of age who participated in an interactive ATV safety training held at the 2017 Oklahoma Wildlife Expo. Prior to participation in the training, youth completed a self-reported questionnaire about their ATV usage behaviors and knowledge. Participants demonstrated mixed results pertaining to their level of ATV-related safety knowledge and behaviors, indicating that there is substantial room for improvement in terms of altering unsafe riding behaviors.

A one-group pre-test/post-test research design was utilized to examine youth participating in a school-based ATV safety training at a rural middle/high school in Oklahoma. Students completed a pre-test survey instrument designed to measure ATV usage behaviors and knowledge prior to participation in the training, and a post-test survey instrument approximately three months after the training was completed. Similar to the findings of participants from the Wildlife Expo, students in the school-based training demonstrated mixed results pertaining to their level of ATV-related safety knowledge and behaviors, indicating that the training was marginally effective at increasing ATV safety knowledge, and was largely ineffective at changing ATV-related behaviors. Continued research efforts are called for in order to improve existing training efforts.

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CHAPTER I

INTRODUCTION

Each year in the United States, hundreds of fatalities and thousands of accidents are reported related to all-terrain vehicle (ATV) usage. Youth are considered an especially at-risk population, predominantly children 16 years of age or younger, because they tend not to use helmets, ride with passengers, ride without adult supervision, ride after dark, and ride ATVs too large or powerful for their age and size (Campbell, Kelliher, Borrup, Corsi, Saleheen, Bourque & Lapidus, 2010; Brown, Koepplinger, Mehlman, Gittelman, & Garcia, 2002; Tormoehlen & Sheldon, 1996).

According to the 2016 Annual Report of ATV-Related Deaths and Injuries, published by the U.S. Consumer Product Safety Commission (U.S. CPSC, 2017), 14,653 ATV-related fatalities, occurring between 1982 and 2016, were reported in the U.S. In the same reporting period (1982 to 2016), 3,163 (22%) reported ATV-related fatalities occurred with children younger than 16 years of age. Of the 3,163 reported fatalities, 1,380 (44%) were younger than 12 years of age. Reporting for 2013 and 2014 is currently ongoing, but it is estimated that 674 ATV-related fatalities were reported to CPSC in 2014, and 657 in 2013 (U.S. CPSC, 2017).

In Oklahoma, 142 ATV-related deaths were reported between 1982 and 2007

(25-year period), of which 53 children were under the age of 16 (U.S. CPSC, 2013). Within the following three years (2008-2011), 50 additional deaths were reported in Oklahoma (U.S. CPSC, 2013). In a study conducted by the Oklahoma State Department of Health during a ten-year period from 1992-2002, 391 people were hospitalized due to injuries sustained from riding an ATV, 38 of whom died due to head injuries (Oklahoma State Department of Health, 2016). In that same time frame (1992-2002), the average number of injuries tripled from 23 injuries per year prior to 1998, to an average of 69 injuries per year thereafter. The highest rates of injury reported were among males ranging from five to 24 years of age (Oklahoma State Department of Health, 2016).

Researchers at the University of Oklahoma's Trauma Center (Kirkpatrick, Puffinbarger, & Sullivan, 2007), found that of the four children who died in ATV-related accidents in 2001, all four deaths were caused by severe head injury and none of the children were found to be wearing helmets. Of the children who experienced ATV-related injuries, the most common injuries reported were related to head trauma, followed by injuries to the upper extremity (fractures most common), face, lower extremity (femur fractures most common), abdomen, chest, pelvis, and spine (Kirkpatrick et al., 2007).

An additional population at risk for ATV-related injuries and fatalities are youth and adults within the agricultural industry. According to the 2011 Farm and Ranch Safety Survey, an estimated 1,580,000 ATVs were in use on farms and ranches in 2011, of which 88% were used for work. Over 119,000 farming and/or ranching operations reported having youth younger than 16 years of age who had operated an ATV (NASS, 2011). In a study conducted by Goldcamp, Myers, Hendricks, Layne, and Helmkamp (2006), an estimated 2,246 non-fatal ATV-related injuries were reported as having occurred to youths younger

than 20 years of age on U.S. farms in 2001. Males accounted for 69% of the injuries reported and 70% of the injuries occurred with youth 10 to 15 years of age. Fifty-eight percent of the ATV injuries reported were a result of recreational activities and many of the injuries involved youth riding without a helmet or operating an ATV too large for such riders (Goldcamp et al., 2006).

Literature suggests that many youth lack any formal ATV riding/safety instruction. Campbell et al. (2010) found that of 228 survey participants, less than 5% of the children who rode ATVs received any type of formal ATV riding/safety instruction. Similar results were reported by Brown et al. (2002), who found that only 14% of children (of 109 survey participants) who had been injured in an ATV-related accident had received any formal training prior to operating such a vehicle. Tormoehlen and Sheldon (1996) found only 1% of youth who rode ATVs (of 2,098 survey participants), were taught by certified, professional ATV instructors.

According to Yuma, Maxson, and Brown (2006), injury prevention reactions have not been quick enough to offset accelerated pediatric ATV use and there is concern that prevention efforts may be met with opposition from ATV manufacturers and users. There have been numerous legislative efforts targeted at pediatric ATV usage in several states, such as Utah (Cvijanovich, Cook, Mann, & Dean, 2001), North Carolina (Beidler, Kromhout-Schiro, Douillet, Riesenman, & Rich, 2009), and Florida (Winfield, Mozingo, Armstrong, Hollenbeck, Richards, Martin, Beierle, & Lottenberg, 2010). Despite these efforts, legislation has been largely ineffective at preventing ATV-related injuries and fatalities (Novak, Hafner, Aldag, & Getz, 2013).

Several studies have examined strategies for effectively implementing injury prevention interventions related to ATV usage (Aitkin, Graham, Killingsworth, Mullins, Parnell, & Dick, 2004; Novak et al., 2013; Burgus, Madsen, Sanderson, & Rautiainen, 2009). Using a focus group methodology, Aitken et al. (2004) reported several suggestions for increasing public awareness about the potential dangers of ATVs, including improved access to ATV videos, education from ATV dealers, expanded hunter education and driver's education courses, public media, print media, and testimonials and group forums. Other suggestions have included offering initial trainings for beginning operators, as well as gender-targeted awareness campaigns (Burgus et al., 2009). Novak et al. (2013) suggested that ATV safety educational interventions should be community-based and should not only target youths, but should additionally target parents and community leaders.

Background

The ATV Ride Safe Oklahoma program is dedicated to promoting safe ATV use (ATV Ride Safe Oklahoma, 2017). The organization is a coalition comprised of the Children's Center for Rehabilitation Hospital, Trauma One at Oklahoma University Medical Center, Oklahoma Cooperative Extension Service 4-H and Youth Development, and Injury Prevention Service through the Oklahoma State Department of Health. The purpose of the ATV Ride Safe Oklahoma program is to promote safe and effective ATV riding practices and to reduce the number of ATV-related injuries and fatalities of youth. Both practical and classroom training is used to specifically target populations at a particularly high risk for ATV injury and is designed to reach children and families in communities where ATV use is common. The program seeks to have a meaningful impact on the knowledge, attitudes, and behaviors of ATV users by 1) educating youth and adults through the hands-on, 5-hour ATV

Safety Institute (ASI) ATV *RiderCourse*^{SM} training (ATV Safety Institute, 2016); and 2) educating youth, using school-based ATV safety curriculum, through schools, clubs, camps, and other youth programs (ATV Ride Safe Oklahoma, 2017).

The following are the identified goals/objectives of the ATV Ride Safe Oklahoma program:

- Educate and inform youth and adult ATV riders about safe riding techniques and practices by disseminating high impact educational materials and programs;
- Help communities address issues related to safe use of ATVs;
- Modify behavior in the following risk factor areas:
    - Not wearing a proper helmet and/or other protective riding gear;
    - Carrying passengers on ATVs not specifically designed for more than one person;
    - Operating/riding ATVs on pavement and/or public roads and highways; and
    - Operating/riding an ATV that is not an appropriate size and power for the rider (ATV Ride Safe Oklahoma, 2017).

As part of the ATV Ride Safe Oklahoma program, the Oklahoma 4-H ATV Safety program (Oklahoma State 4-H Program, n.d.) is able to disseminate educational materials and programs through myriad outlets, including the hands-on ASI ATV *RiderCourse*℠ training and through ATV safety programs delivered to schools, clubs, camps, and other youth programs. The ASI ATV *RiderCourse*℠ training is taught by ASI certified instructors, who have completed a week-long training and demonstrated competency in instructing youth and adults on how to safely and effectively operate all-terrain vehicles. The *RiderCourse*℠ is a 4 to 5 hour, hands-on training, offered in class sizes of four to eight students. The

participants are given the opportunity to increase their safety knowledge and to practice basic riding skills in a controlled environment under the direct supervision of a licensed instructor. In addition to the hands-on components of the training, participants also learn about proper safety gear, local regulations, places to ride, and environmental concerns.

Additionally, the ATV Ride Safe Oklahoma program has three mobile training trailers, which can be utilized by educators anywhere in the state to offer the hands-on *RiderCourse*℠ training. Each trailer accommodates up to 10 ATVs, plus equipment, so participants do not have to bring, or even own, an ATV to complete the training. In addition to being used for *RiderCourse*℠ trainings, the trailers have been utilized at farm safety days, the Oklahoma Wildlife Expo, county and state fairs, and various other events throughout the state with high attendance by youth and adults. The Oklahoma 4-H ATV Safety Program is also able to provide community-based, in-school ATV safety educational programs, taught by trained Cooperative Extension Service educators and volunteers. Instructors are able to utilize ASI resources, such as the ASI online E-course, as well as the National 4-H ATV Safety Leader's Guide classroom curriculum. Presentations can be given to individual classes or to large, school-wide assemblies.

Purpose of the Study

Injuries and fatalities related to ATV usage among youth has been identified as an ongoing concern for not only the state of Oklahoma, but also the nation. While studies related specifically to ATV usage behaviors have been conducted, little is known about how ATV safety-related trainings impact youths' ability to exhibit safe and responsible riding behaviors. This study will seek to examine ATV usage behaviors among youth in Oklahoma

and will also determine the impact ATV safety trainings have on youths' knowledge and behaviors related to ATV safety.

Research Objectives

The research objectives for this study are divided based on the two studies that comprise Chapters 4 and 5 of this document. Study I (Chapter 4), *An examination of ATV usage behaviors and knowledge of youth participating in an interactive ATV safety training*, is guided by the following research objectives:

1. Describe the demographic characteristics of youth participating in an interactive ATV safety training, based on level of ATV-related experience;
2. Describe prevalence of ATV usage, ATV-related injuries, and previous participation in an ATV-related safety training;
3. Describe ATV usage behaviors of participants with ATV-related experience pertaining to:
    a. Helmet use
    b. Safety equipment/riding gear use
    c. Riding and/or operating ATVs with passengers
    d. Riding on public roads and/or highways
    e. Riding inappropriately sized machines;
4. Describe and compare participants' level of ATV-related knowledge, based on level of ATV-related experience, pertaining to:
    a. Helmet use
    b. Safety equipment/riding gear use
    c. Riding and/or operating ATVs with passengers

d. Riding on public roads and/or highways

e. Riding inappropriately sized machines.

5. Compare pre- and post-test results for participants' ATV-related behaviors and knowledge prior to and after participation in an interactive ATV safety training.

Study II (Chapter 5), *An examination of ATV usage behaviors and knowledge of youth participating in a School-Based ATV safety training,* is guided by the following research objectives:

1. Describe the demographic characteristics of students participating in a school-based ATV safety training;
2. Describe prevalence of ATV use, injury prevalence, and prior participation in an ATV-related safety training;
3. Determine if ATV usage behaviors - pertaining to prevalence of helmet use, safety equipment/riding gear use, riding and/or operating ATVs with passengers, riding on public roads or highways, and riding inappropriately sized machines – changed after participation in an ATV safety training;
4. Determine if knowledge related to ATV safety changed after participation in an ATV safety training.

Significance of the Study

The increasing popularity and use of all-terrain vehicles correlates with increasing evidence of ATV-related injuries and fatalities (Bansal, Fortlage, Lee, Kuncir, Potenza, Coimbra, 2008; CPSC, 2017). The utilization of two differing experiential ATV safety trainings could shed light on the best instructional approaches to employ when attempting to

increase knowledge retention related to safe and effective ATV riding behaviors. The findings of this study could serve as a guideline for conducting ATV safety educational interventions with youth.

Limitations

1. A primary limitation of this study, as a whole, pertains to the single populations utilized for Study I and Study II, and the limited size of said populations. The results obtained have limited generalizability beyond the scope of this study.
2. Reliability coefficients were not established for Novak et al.'s (2013) original survey instrument, which served as the basis for this particular study. The need for continued psychometric refinement of the instrument is acknowledged.

Definition of Terms

All-Terrain Vehicle (ATV) – The Specialty Vehicle Institute of America (2017) defines an ATV as a "motorized, off-highway vehicle designed to travel on four low-pressure or non-pneumatic tires, having a seat designed to be straddled by the operator and handlebars for steering control" (para. 1). ATVs are subdivided into two categories: Type I ATVs and Type II ATVs. Type I ATVs are intended for use with a single operator and no passengers. Type II ATVs are intended for use by an operator and one passenger, and is equipped with a designated seating position behind the operator (Specialty Vehicle Institute of America, 2017).

CC – Cubic centimeters (cc), refers to how the engine size of an all-terrain vehicle is measured (Ryczkowski, 2018). The cc "measures the volume of fuel mixed with air that moves through the engine system (displacement) during one rotation of an engine cycle, which is each piston moving from top to bottom" (Ryczkowski, 2018, para. 1).

ATV Safety Institute (ASI) – The All-Terrain Vehicle Safety Institute (ASI) (2017), a "not-for-profit division of the Specialty Vehicle Institute of America (SVIA), was formed in 1988 to implement an expanded national program for all-terrain vehicle (ATV) safety education and awareness" (para 1). The primary goal of ASI is to promote safe and responsible use of ATVs.

ASI RiderCourse – An ATV RiderCourse training is a "hands-on, half-day class conducted by ATV Safety Institute instructors. The course offers students an opportunity to increase their safety knowledge and practice basic riding skills in a controlled environment under the supervision of a licensed instructor" (ATV Safety Institute, 2017, para 1).

ATV Ride Safe Oklahoma – a coalition comprised of The Children's Center Rehabilitation Hospital, Trauma One at OU Medical Center, Oklahoma State University Extension/4-H Youth Development, and Injury Prevention Service through the Oklahoma State Department of Health (ATV Ride Safe Oklahoma, 2018). The purpose of the coalition is to promote safe ATV use through the use of educational interventions.

Experiential Learning – the operational definition of experiential learning utilized for this study is Kolb's (2015) definition: "the process whereby knowledge is created through the transformation of experience" (p. 49).

CHAPTER II

REVIEW OF LITERATURE

The prevalence of injuries and/or fatalities related to unsafe all-terrain vehicle (ATV) behaviors is an issue of increasing concern. Youth are considered an especially at-risk population, predominantly children 16 years of age or younger. Educational interventions targeted specifically at ATV usage behaviors and knowledge could serve as a means to potentially reduce the number of youth injured due to ATV-related accidents.

This chapter provides an in-depth review of the literature related to ATV usage in the United States. The chapter outlines several variables related to ATV use, specifically examining the history of ATVs in the United States, the prevalence of ATV-related injuries among youth populations, ATV use within the agricultural industry, ATV-related legislation, and educational interventions. The theoretical framework utilized for this study, Kolb's (1984, 2015) Experiential Learning Theory, is also described.

Literature Related to ATV Use

History of ATVs in the United States

The first ATV in the United States was introduced in 1970 by Honda Motor Company and was a seven-horsepower, three-wheeled vehicle known as the US90, or ATC90 (All-Terrain Cycle) (Honda Media Newsroom, 2004). ATVs at this time were

considered purely recreational, but farmers soon began to realize the potential for the machines (Tuttle, 2014). Honda, and other ATV manufacturers, such as Kawasaki, Polaris, and Suzuki, were soon offering numerous variations of three-wheeled vehicles, followed shortly thereafter by the first four-wheeled vehicles in the 1980s (Tuttle, 2014).

The new four-wheeled vehicles helped initiate the decline of the three-wheeler era, which ended in 1987 when the Consumer Product Safety Commission (CPSC) sued ATV manufacturers due to safety concerns with the vehicles (Tuttle, 2014; Yuma, Maxson, & Brown, 2006). This lawsuit resulted in a ten-year ban, which "mandated that manufacturers would halt the production of three-wheeled ATVs, recommend engine size and rider restrictions, ensure that dealers comply with age recommendations, and promote public awareness of the hazards of ATVs" (Yuma et al., 2006, p. 67-68). While the consent decree expired in 1998, evaluations have revealed that the decree was largely unsuccessful in reducing ATV-related injuries (Yuma et al., 2006). According to the American Academy of Pediatrics (2000), an effective outcome of the decree was the attendant publicity leading up to its passing, as well as the push for ATV safety educational campaigns afterwards. After the expiration of the decree in 1998, the CPSC entered into a voluntary ATV Action Plan with ATV manufacturers, which stipulates strategies similar to those outlined in the original decree (Bansal, Fortlage, Lee, Kuncir, Potenza, & Coimbra, 2008).

While preliminary ATV models were typically classified as sport models, built for performance, by the mid to late 1980s, utility-type ATVs were becoming increasingly popular among hunters, farmers, ranchers, and at construction sites (ATV Quad News, 2017). With interest in the use of ATVs for both recreation and racing, engine sizes

quickly grew from the 70 cc and 90 cc models of the 1970s, to the 700 cc and higher engine models available today (Yuma et al., 2006). Today's models continue to be designated as either "sport" or "utility." Sport models are generally small and light, with manual transmissions that allow the vehicle to accelerate quickly up to speeds of 90 miles per hour (ATV Quad News, 2017). Utility-type ATVs are often large, four-wheel drive vehicles that are capable of speeds up to 70 miles per hour and can also be used for hauling small loads with attached racks or trailers (ATV Quad News, 2017).

By today's standards, an ATV is defined as "a motorized off-highway vehicle designed to travel on four low-pressure or non-pneumatic tires, having a seat designed to be straddled by the operator and handlebars for steering control" (ATV Safety Institute, 2017). Due to the machine's having low-pressure tires (usually between 2-10 psi, depending on the manufacturer's recommendations), it is critical for riders to understand that ATVs are not designed to be used on paved surfaces, as pavement may seriously affect the machine's handling ability and level of rider control (Specialty Vehicle Institute of America, 2014). As the name implies, ATVs are intended for off-road, all-terrain use (Jones & Bleeker, 2005).

ATV-Related Injuries in Youth Populations

According to the most recently published Consumer Product Safety Commission 2015 Annual Report of ATV-Related Deaths and Injuries (2017), from 1982 to 2015, 3,163 ATV-related fatalities of children younger than 16 years of age were reported, representing 22% (14,129) of the total number of reported ATV-related fatalities during that same time period. As of 2012, the most recent year where reporting is considered

complete, 12% of the reported 573 ATV-related fatalities occurred with children younger than 16 years of age (CPSC, 2017).

In a study conducted by Cvijanovich, Cook, Mann, and Dean (2001), the researchers found that "children had significantly higher injury rates than adults, indicating that operating or riding on ATVs carries a particularly high risk of injury to children" (p. 634). According to Jones and Bleeker (2005), many of the ATV-related injuries among youth have occurred when "the operator lost control, the vehicle rolled over, the operator or passenger was thrown off, or there was a collision with a fixed object" (p. 70).

In a report from the Oklahoma State Department of Health (Wendling, 2007) on hospitalized and fatal ATV-related injuries in Oklahoma for the year 2007, 198 youth sustained ATV-related injuries, 12 of whom died. Of the survivors, only 13% of youth were documented to be wearing a helmet. The highest number of injuries and fatalities occurred with youth 16 years of age and older. Of the cases where the accident circumstances were known, over one-quarter collided with a fixed/stationary object and 7% collided with a moving object, such as another ATV or a licensed motor vehicle. Fifty-two percent of the reported injuries involved the ATV rolling over and more than a third of those individuals were struck or crushed by the ATV (Wendling, 2007).

According to literature produced by the Specialty Vehicle Institute of America – ATV Safety Institute (2014) regarding "Parents, Youngsters, and All-Terrain Vehicles," there are several variables to take into consideration before allowing youth to operate ATVs. It is important to assess young riders' degree of readiness, specifically pertaining to physical size, strength, coordination, visual perception, emotional maturity, and the

ability to make good decisions. Youth should only operate vehicles that are recommended for the child's age group, based on the manufacturer's minimum age recommendation warning label posted on the ATV. Although a child may be the appropriate age to operate a particular size ATV, supervising adults should remain cognizant that not all youth have the ability to safely operate the vehicle (SVIA-ASI, 2014).

In order to determine if a youth is big enough for a particular ATV, a supervising adult can have the child stand on the footrests with their hands gripping the handlebars, and can determine if there is at least three inches of clearance between the seat of the child's pants and the ATV seat (SVIA-ASI, 2014). ATVs are considered "rider active" machines and riders must be able to shift their body forward or backward and side to side in a "seat-off-seat" motion (ATV Safety Institute, 2015). Therefore, riders must also be able to comfortably reach and work all controls, such as the steering, throttle and brake levers, and gearshift lever (SVIA-ASI, 2014).

In addition to physical capabilities, youth must also possess the social and emotional skills necessary to safely and effectively operate an ATV (SVIA-ASI, 2014). Youth must be willing to follow rules and should exhibit safety-conscious attitudes toward ATV operation. Youth must also understand what can result from improper ATV operation and of the serious consequences that can be associated with reckless behavior or poor decision-making. Lastly, youth should possess necessary visual perceptions, such as the ability to "see objects 90 degrees to the side while looking straight ahead" (SVIA-ASI, 2014, p. 5) and the ability to judge distance, as well as sufficient motor development, specifically related to hand, foot, and body movements.

ATV Use in Agriculture

While ATVs are a popular form of transportation and recreation among youth populations, they are also commonly used for farm-related activities (Jones & Bleeker, 2005). ATVs are often used for checking cattle, hauling feed to horses, spraying pesticides in fence lines, and hunting (Burgus, Madsen, Sanderson, & Rautiainen, 2009; Goldcamp, Myers, Hendricks, Layne, & Helmkamp, 2006). With the advent of a "large number of special attachments, the ATV has become a practical work machine" (Tormoehlen & Sheldon, 1996, p. 147), capable of serving in numerous work-related capacities.

According to a 2001 Childhood Agricultural Injury Survey, there were an estimated 857,665 ATVs in use on farms in the United States, with 60% of the ATVs being used 10 or more times per month by someone on the farm (Goldcamp, Myers, Hendricks, Layne, & Helmkamp, 2006). Of the estimated 1,075,759 youth living on farms in 2001, 51% of youths between the ages of 16-19 years of age had operated an ATV, the majority being male operators (Goldcamp et al., 2006). In the same reporting year, there were an estimated 1,667 ATV-related injuries to farm youth, yielding an injury rate of 4.3 injuries for every 1,000 youths who operated ATVs (Goldcamp et al., 2006).

Similar to findings of other studies that have examined ATV usage behaviors among youth populations, youths living on farms and in rural areas tend to mirror national trends. In an examination of ATV safety and use patterns of 4-H members in central Illinois, youth reported operating adult-sized ATVs, carrying passengers, and not wearing helmets and/or other appropriate safety equipment (Hafner, Hough, Getz,

Whitehurst, & Pearl, 2010). These same youth were found to rarely have participated in any form of ATV safety training and accidents were numerous, indicating a key area for educational intervention (Hafner et al., 2010). In a comparison of ATV-related behaviors, exposures, and injuries between farm youth and nonfarm youth (Jones & Bleeker, 2005), the results of the study suggest that while a higher percentage of farm youth operate ATVs than their nonfarm counterparts, their use does not result in a statistically significant increase in injuries.

In 2000, the Committee on Agricultural Safety and Health Research and Extension by the United States Department of Agriculture Cooperative State Research, Education, and Extension Service (USDA-CSREES) North Central Regional (NCR) Administrators was formed (Committee on Agricultural Safety and Health Research and Extension, 2009). In 2003, the North Central Education/Extension Research Activity (NCERA) 197 Committee created a landmark publication titled, "*National Land Grant Research and Extension Agenda for Agricultural Safety and Health: National Agenda for Action*," (p. iii) which outlined twelve priorities for action.

1. "Sensors and Guarding Systems
2. Agricultural Equipment on Public Roads
3. Agriculture Confined Spaces
4. Emerging Technologies
5. Human Factors Engineering and Design
6. Management of Agricultural Emergencies
7. Livestock Handling and Housing Systems
8. Public Policy Issues

9. Capital and Management Intensive vs. Family Labor Intensive Operations
10. Fire Detection and Suppression
11. Agricultural Safety Education and Training
12. Special Populations and Enterprises" (Committee on Agricultural Safety and Health Research and Extension, 2009, p. iii)

The purpose of this report, and subsequent research pertaining to each of the 12 priorities for action, was to "help identify research, policy, and Extension/outreach priorities," as well as "identify possible design and practice standards, goals, or guidelines for farm equipment manufacturers, standard setting organizations, and government agencies" (Committee on Agricultural Safety and Health Research and Extension, 2009, p. iii). The priorities for action which pertain specifically to this study include *Operating Agricultural Equipment on Public Roads*; *Agricultural Safety Education and Training*; and *Special Populations and Enterprises*.

Priority for Action #2: *Operating Agricultural Equipment on Public Roads*, highlights the mix of rapid urbanization in traditional agricultural production areas with licensed motor vehicles and agricultural equipment on public roads, including tractors and specialized vehicles such as ATVs, snowmobiles, and horse-drawn buggies (NCR-197, 2003). In the case of ATVs, the potential for public road crashes has increased with the development of machines that are capable of significantly faster speeds (NCR-197, 2003).

In Oklahoma alone, numerous instances of fatal crashes involving licensed motor vehicles and specialized recreational vehicles have been documented. In 2017 in Paden, Oklahoma, a fatal crash was reported between a 16-year old youth operating an ATV

who struck a pickup truck (NewsOK, 2017). The boy, who was not wearing a helmet, died at the scene (NewsOK, 2017). In another fatal instance in Poteau, Oklahoma, a 10-year old boy operating an ATV was struck by another ATV carrying three children between the ages of five and 14 (Simon & Meyers, 2017). According to the Oklahoma Department of Safety, 12 ATV accidents occurred in LeFlore County (the same county the aforementioned accident occurred) between 2014 and 2016, two of which were fatal (Simon & Meyers, 2017).

Priority for Action #11: *Agricultural Safety Education and Training*, pertains to the vital role that land-grant universities and the Cooperative Extension Service play in disseminating safety and health education and trainings for agricultural producers, families, and employees (NCR-197, 2003). By offering trainings via the nationwide network of county-level Extension educators, the report claims that it is "the most effective mechanism available for delivery of research-based information and training on preventing agricultural workplace-related injuries and illnesses" (NCR-197, 2003, p. 8). In addition to land-grant universities and Extension offering agriculturally-related safety trainings, the report also identifies Priority for Action #12: *Special Populations and Enterprises*, which specifically examines the prevalence of injuries to children and youth (NCR-197, 2003).

Educational Interventions

When examining educational interventions related to childhood injury prevention, community-based approaches have been found to be effective (DiGuiseppi, Rivara, Koepsell, & Polissar, 1989; Towner & Dowswell, 2002). According to Towner and Dowswell (2002), "the use of multiple interventions implemented over a period of time

can allow injury prevention messages to be repeated in different forms and contexts and can begin to develop a culture of safety within a community" (p. 282). Important elements of community-based programs include having a long-term strategy, effective and focused leadership, and multi-agency collaboration (Towner & Dowswell, 2002).

In an evaluation of a community-wide bicycle helmet campaign conducted in Seattle, Washington, researchers found that the campaign, which sought to increase parental awareness, promote helmet use by children, and reduce financial barriers to the purchasing of helmets, resulted in a significant increase in helmet use (DiGuiseppi et al., 1989). To raise parental awareness, the campaign utilized public service announcements on both TV and radio, press conferences, television programs, print articles and pamphlets, and numerous presentations at community-based events (DiGuiseppi et al., 1989). To promote helmet use by children, a bicycle safety program was taught in numerous Seattle elementary schools, which included incentives for children who wore helmets at various bicycling events, such as posters, stickers, and coupons for McDonald's french fries and Seattle Mariners baseball tickets (DiGuiseppi et al., 1989). To offset helmet costs, the campaign distributed coupons to physicians' offices, schools, youth groups, and various community events (DiGuiseppi et al., 1989).

In a similar examination of bicycle helmet use among youth, Morris and Trimble (1991) compared three schools that received either no educational intervention (the control school), a helmet awareness program intervention (the education-only school), or an intervention plus an opportunity to purchase bicycle helmets at a substantially reduced price (the subsidized school). The researchers concluded that while education and awareness-raising alone did not effect any change in bicycle helmet use, the subsidized

school exhibited a significant increase in helmet use after the program, as compared to the control school, who received no training or helmet subsidy.

ATV-Related Legislation

While educational interventions are critically important for decreasing childhood injury rates, literature suggests they may not be enough (Warda, Klassen, Buchan, & Zierler, 1998; Morris & Trimble, 1991). According to Yuma et al. (2006), injury prevention reactions have not been quick enough to offset accelerated pediatric ATV use and there is concern that prevention efforts may be met with opposition from ATV manufacturers and users. While there have been numerous legislative efforts targeted at pediatric ATV usage in several states, such as Utah (Cvijanovich, Cook, Mann, & Dean, 2001), North Carolina (Beidler, Kromhout-Schiro, Douillet, Riesenman, & Rich, 2009), and Florida (Winfield, Mozingo, Armstrong, Hollenbeck, Richards, Martin, Beierle, & Lottenberg, 2010), legislation has been largely ineffective at preventing ATV-related injuries and fatalities (Novak, Hafner, Aldag, & Getz, 2013).

Oklahoma House Bill 1686 (Nations, Sullivan, Roan, Collins, Wesselhoft, McAffrey, Lindley, & Rice, 2007) currently stipulates that it is unlawful for anyone under the age of 18 to operate or be a passenger on an ATV without a helmet. The bill also states it is unlawful for the operator of an ATV to carry a passenger unless the ATV is specifically designed to carry more than one person (Nations et al., 2007). The fine and court costs associated with violating these laws shall not exceed $25 and may be enforced by any peace officer of the state of Oklahoma (Nations et al., 2007).

Additionally, Senate Bill 1356 (Bass, 2012) stipulates that ATVs are not to be operated on public roads and/or highways with the following exceptions: 1) if the vehicle

needs to make a direct crossing of a street or highway, the ATV may cross at approximately a ninety-degree angle, 2) if the vehicle needs to travel on a public road in order to cross a train track, 3) if the operator crossing a street or highway has a valid driver's license, or 4) if the operator makes a crossing during daylight hours. The same bill stipulates numerous guidelines for the operation of golf carts by youth, stating that youth who are at least 12 years of age but are not yet 16 years of age shall not operate a golf cart unless they have successfully completed a golf cart safety education course or have passed a proctored equivalency exam, and have received a golf cart education certificate (Bass, 2012). However, no such stipulations appear in the same bill pertaining to ATV usage (Bass, 2012).

ATV Safety Training Effectiveness

Several studies have examined strategies for effectively implementing injury prevention interventions related to ATV usage (Aitkin, Graham, Killingsworth, Mullins, Parnell, & Dick, 2004; Novak et al., 2013; Burgus, Madsen, Sanderson, & Rautiainen, 2009). Novak et al. (2013) utilized a one-group pre-test/post-test design to survey participants' knowledge related to ATV safety, personal safety practices, ATV use, and prevalence of ATV-related accidents and injuries. An ATV safety educational intervention was presented at two high schools and one middle school, consisting of a PowerPoint lecture highlighting ATV usage, injury statistics, and recommended safety practices, coupled with static demonstrations using a full-sized ATV and safety equipment. Pre- and post-test analysis determined that the safety program effectively increased safety knowledge, yet demonstrated little impact on altering unsafe riding behaviors (Novak et al., 2013).

In an examination of youth participating at the National FFA Convention, Burgus et al. (2009) administered a survey to describe ATV-related behaviors, perceptions of hazards when operating an ATV, prevalence of previous participation in an ATV safety training, and the frequency of ATV-related injuries. The results revealed that relatively low compliance with ATV Safety Institute (ASI) best safety practices were adhered to and a low percentage of participants had previously attended an ATV safety training. Univariable logistic regression analysis indicated that participation in an ATV safety training had a significant positive association with helmet usage, as well as behaviors related to never carrying passengers, never riding as a passenger, and never operating an ATV on paved roads. Conversely, participation in an ATV safety training was associated with an increase in injuries (Burgus et al., 2009).

Using a focus group methodology, Aitken et al. (2004) reported several suggestions for increasing public awareness about the potential dangers of ATVs, including improved access to ATV videos; education from ATV dealers; expanded hunter education and driver's education courses; public media, print media, and testimonials; and group forums. Youth populations interviewed for the study suggested that they would be more likely to listen to peers speak about ATV safety in a school assembly, as well as celebrity-type figures or ATV injury patients, as opposed to being attracted to posters or other print media (Aitken et al., 2004). Both adult and youth populations interviewed disliked draft PSA's which included a reference to an age limit of 16 years or older for ATV use, and preferred messages which emphasized that ATVs should be used according to the manufacturer's guidelines and are not toys (Aitken et al., 2004).

A research study report prepared for the National 4-H Council (2003), examining the 4-H Community ATV Safety Program from 2002-2003, indicated that the program has been successful in terms of positively influencing the attitudes and behaviors of youth engaging in ATV-related activities. Pre- and post-test analysis indicated that the program positively influenced attitudes and behaviors among youth in terms of: 1) "wearing helmets; 2) wearing protective clothing; 3) wearing eye protection or goggles; 4) carrying passengers or riding double; 5) riding on pavement; 6) riding on or alongside the road; and 7) being injured or involved in ATV-related accidents" (National 4-H Council, 2003, p. 2). Statistically significant differences between pre- and post-test scores were observed for all seven ATV-related behaviors, indicating that risky behaviors decreased and protective factors increased (National 4-H Council, 2003).

An important qualitative finding of the study related to the prevalence of helmet use indicated that the majority of youth who do not wear a helmet do so simply because they do not have a helmet and cannot afford to purchase one, even when they recognize the importance of wearing one (National 4-H Council, 2003). Therefore, many of the ATV safety coordinators were able to negotiate agreements with helmet manufacturers to purchase helmets at a wholesale cost, or sought grant funding through the National 4-H Council to purchase helmets for program participants (National 4-H Council, 2003). Additionally, the study revealed that many parents recognize the need for an ATV safety program, as well as the need for parents to supervise their children when operating ATVs (National 4-H Council, 2003).

In a pre- and post-test comparison of youth who participated in two versions of the interactive ASI *RiderCourse* training - either the Standard Course or an abbreviated

version known as the S-Course - a significant difference was seen in knowledge test scores for both groups (Bocksnick, 2016). When comparing knowledge scores between groups, no statistically significant difference was found, indicating that knowledge scores increased regardless of which training youth participated in (Bocksnick, 2016).

Other suggestions pertaining to ATV-related safety education have included offering initial trainings for beginning operators and more advanced continuing education opportunities for experienced operators, as well as gender-targeted awareness campaigns (Burgus et al., 2009). Novak et al. (2013) suggested that ATV safety educational interventions should be community-based and should not only target youths, but should additionally target parents and community leaders. This sentiment was echoed by findings from the evaluation of the 4-H Community ATV Safety Program (National 4-H Council, 2003), stating "there needs to be a change in attitude from complacency to awareness on the part of both parents and youth" (p. 15).

Theoretical Framework

Experiential Learning Theory

All learning is experiential (Dewey, 1938; Joplin, 1981, Kolb, 2015), but not all experiences can be considered experiential. Merely participating is not enough to constitute experiential learning (Mazurkewicz, Harder, & Roberts, 2012) – it is the process of reflection which turns experiences into experiential education (Joplin, 1981). Dewey (1938) asserted that "some experiences are mis-educative. Any experience is mis-educative that has the effect of arresting or distorting the growth of further experience" (p. 13-14). Likewise, some experiences can even "narrow rather than expand pedagogical possibilities" (Glazier, Bolick, & Stutts, 2017). It is important to distinguish also between

true, deliberately planned experiential activities and those activities that are "experiential" only in name (Glazier et al., 2017).

Kolb (2015) defined learning as "the process whereby knowledge is created through the transformation of experience" (p. 49). His experiential learning theory is called thus to emphasize "the central role that experience plays in the learning process" (Kolb, Boyatzis, & Mainemelis, 1999, p. 2). The process is described as "a dynamic view of learning based on a learning cycle driven by the resolution of the dual dialectics of action/reflection and experience/abstraction" (Kolb, 2015, p. 50-51).

Theoretical Foundations of Experiential Learning Theory

The intellectual origins of Kolb's (1984, 2015) experiential learning theory can be traced to the seminal works of Kurt Lewin's (1951) social psychology, John Dewey's (1938) philosophical pragmatism, and Jean Piaget's (1970) cognitive-developmental genetic epistemology (Kolb et al., 1999). The Lewinian experiential learning model (Figure 2.1) purports that learning is a four-stage cycle, consisting of an immediate concrete experience, followed by observations and reflections upon said experience. These observations are then assimilated through the formation of abstract concepts and generalizations. The learner then tests the implications of their theories or hypotheses in new experiences. Kolb (2015) noted that two elements of this model are particularly noteworthy, the first being "the emphasis on the here and now concrete experience to validate and test abstract concepts" (p. 32), and the second being the concept of feedback processes, which allows for the continual process of "goal-directed action and evaluation of the consequences of that action" (p. 33).

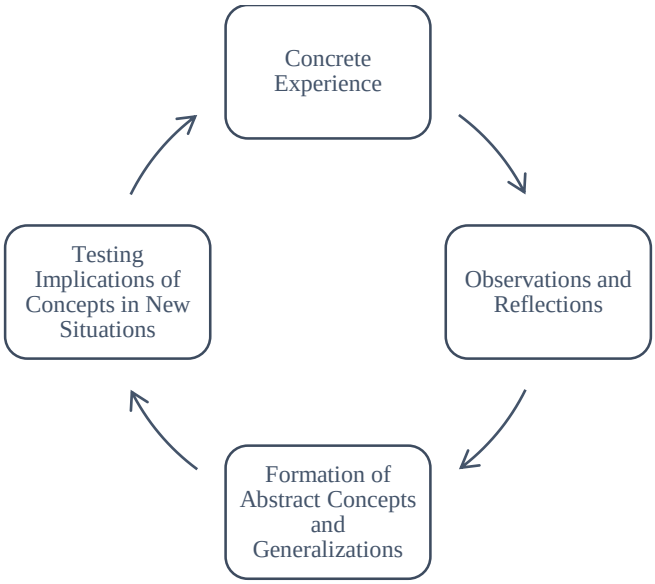

Figure 2.1. The Lewinian Experiential Learning Model. Reprinted from Experiential Learning: Experience as the Source of Learning and Development, 2nd, (p. 32), by David A. Kolb, 2015, Upper Saddle River, NJ: Pearson Education, Inc. Copyright 2015 by Pearson Education, Inc. Reprinted with permission

Dewey's (1938) model of experiential learning (Figure 2.2) is similar to Lewin's in that both are cyclical, four-stage processes, but Dewey's model makes more explicit the developmental nature of learning by describing how "learning transforms the impulses, feelings, and desires of concrete experience into higher-order purposeful action" (Kolb, 2015, p. 33). In Dewey's model, learners are guided by an initial impulse, followed by observation, knowledge, and judgement, ultimately leading to a "sophisticated, mature purpose" (Kolb, 2015, p. 33). Also similar to Lewin's model, which juxtaposes the dialectically opposed forces of experience/theory and observation/action, Dewey's model integrates the "opposing but symbiotically related processes" (Kolb, 2015, p. 33) of impulse/knowledge and observation/judgement.

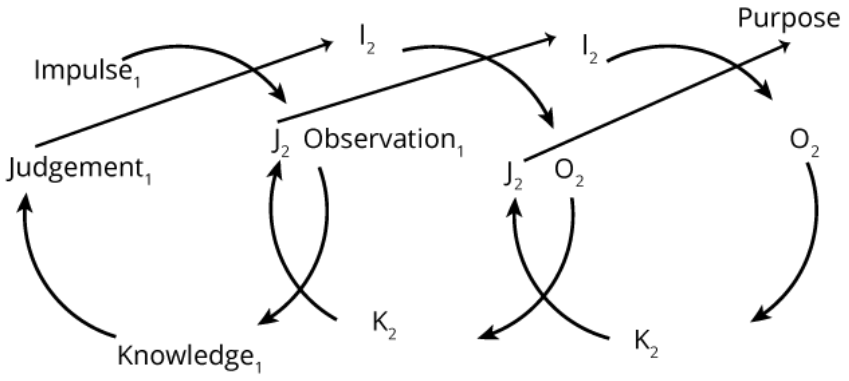

Figure 2.2. Dewey's model of experiential learning. Reprinted from Experiential Learning: Experience as the Source of Learning and Development, 2nd, (p. 34), by David A. Kolb, 2015, Upper Saddle River, NJ: Pearson Education, Inc. Copyright 2015 by Pearson Education, Inc. Reprinted with permission.

Jean Piaget (1970) (Figure 2.3) echoes Lewin's and Dewey's dimensions of experience/concept and reflection/action by postulating that human development moves from a concrete phenomenal view of the world to an abstract constructionist view, from an active egocentric view to a reflective internalized mode of knowing" (Kolb, 2015, p. 34). Piaget believed that the learning cycle occurs in an interaction between the individual and their environment and that the key to learning lies in the mutual interaction between the processes of accommodation and assimilation. He purported that cognitive growth is based on the continual interaction and balance between these two processes, which occurs in successive stages and builds upon existing experiences to create higher levels of cognitive functioning (Kolb, 2015).

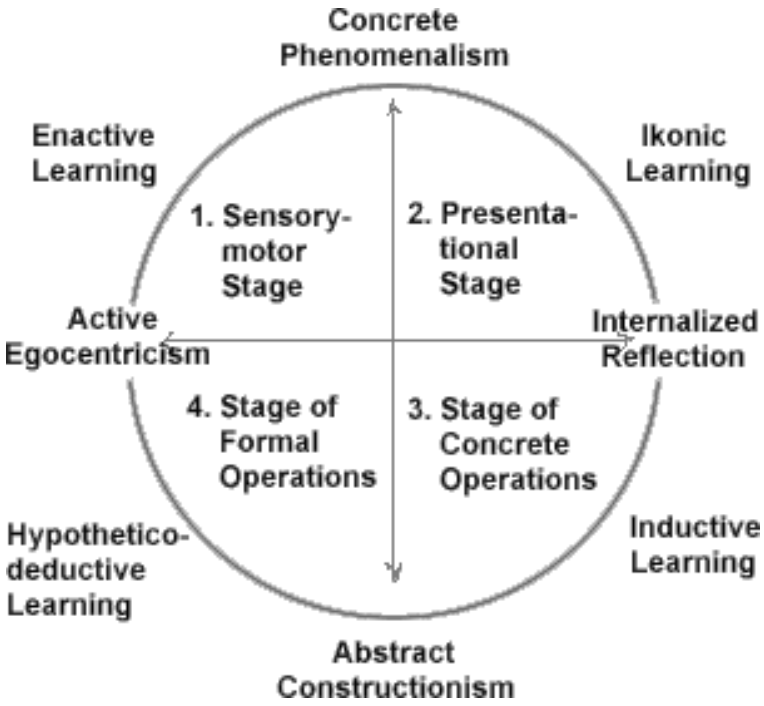

Figure 2.3. Piaget's Model of Learning and Cognitive Development. Reprinted from Experiential Learning: Experience as the Source of Learning and Development, 2nd, (p. 36), by David A. Kolb, 2015, Upper Saddle River, NJ: Pearson Education, Inc. Copyright 2015 by Pearson Education, Inc. Reprinted with permission.

Kolb's (1984, 2015) model (Figure 2.4) of experiential learning serves as an integration of the aforementioned foundational scholars' models of learning. The outer cyclical portion of the model, comprising the four learning modes of concrete experience, reflective observation, abstract conceptualization, and active experimentation, is attributed to Lewin and Dewey's models. Piaget's influence is seen in the two dialectically opposed dimensions of prehension, or grasping, and transformation, resulting in four equal adaptive learning modes: prehension via apprehension ("reliance on the tangible, felt qualities of immediate experience" p. 67) or comprehension ("reliance on conceptual interpretation and symbolic representation" p. 67); and transformation via intention ("internal reflection" p. 67) or extension ("active external

manipulation of the external world" p. 67). Kolb stated that the premise behind these dimensions is that learning requires "both a grasp or figurative representation of experience and some transformation of that representation" (p. 68). The simple perception of an experience is not enough, something must be done with it for learning to occur.

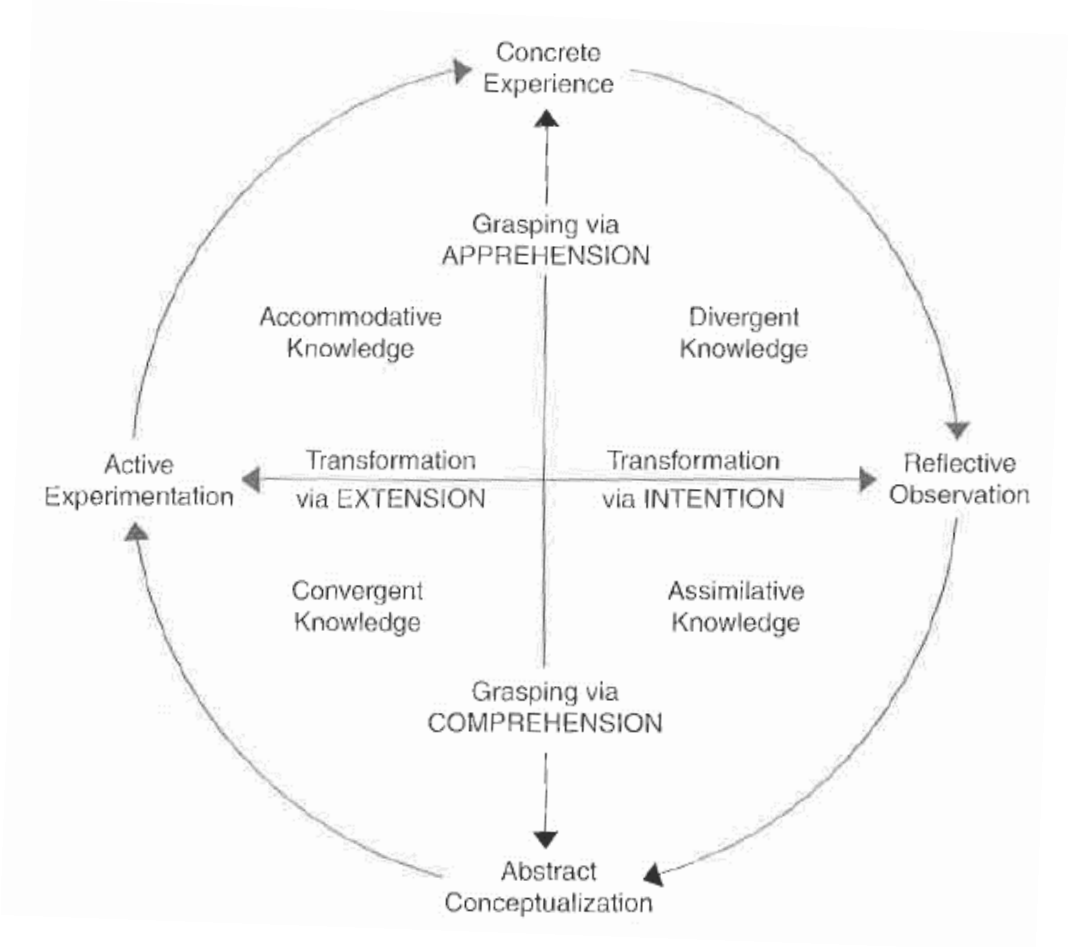

Figure 2.4. Kolb's (1984, 2015) Experiential Learning Cycle. Reprinted from Experiential Learning: Experience as the Source of Learning and Development, 2nd, (p. 68), by David A. Kolb, 2015, Upper Saddle River, NJ: Pearson Education, Inc. Copyright 2015 by Pearson Education, Inc. Reprinted with permission.

The Process of Experiential Learning

Kolb's (1984/2015) theory is built on six assumptions of learning: 1) "learning is best conceived as a process, not in terms of outcomes" (p. 37); 2) all learning is relearning (Kolb & Kolb, 2005, p. 194); 3) "the process of learning requires the resolution of conflicts between dialectically opposed modes of adaptation to the world" (Kolb, 1984/2015, p. 40); 4) "learning is an holistic process of adaptation to the world" (p. 43); 5) "learning involves transactions between the person and the environment" (p. 45); and 6) "learning is the process of creating knowledge" (p. 48).

Rogers (1969) asserted "there is such a thing as significant, meaningful experiential learning" (p. 4). He further defined the elements of experiential learning, stating that learning has a quality of personal involvement, is self-initiated, is pervasive, is evaluated by the learner, and has meaning (Rogers, 1969). In experiential education, students are treated as "active participants in their own education," and are "encouraged to take the initiative to seek and learn from the expertise of those around them" (Carver, 1996, p. 153). As outlined in the principles of experiential education, defined by the Association for Experiential Education, throughout the learning process, learners should be "actively engaged in posing questions, investigating, experimenting, being curious, solving problems, assuming responsibility, being creative, and constructing meaning" (para. 2).

It is important to note that experiential learning is often misunderstood and misapplied as a set of tools and techniques (Kolb & Kolb, 2005; Roberts, 2005), or as a term merely used to describe the recording of an experience, when in actuality, experiential learning "is above all a philosophy of education" based on experience (Kolb

& Kolb, 2005, p. 193). For an educator who wishes to embody an experiential approach to teaching, it is important to distinguish the exact role that an educator must exemplify. In experiential learning, the teacher is viewed as a facilitator, who helps lead students in the construction of knowledge (Carver, 1996). This is in opposition to the role of an instructor or lecturer, which is often represented by the more traditional, behaviorist approach to education, or what Paulo Freire describes as the "banking concept of education," where ideas are "deposited" into learners' heads (Kolb, 2015, p. 29) and students are passive recipients of knowledge (Carver, 1996).

Therefore, it is the role of the educator to cultivate an environment which nurtures the development of a physical and social context for learning, to introduce resources into the learning environment, and to make decisions on how said resources are utilized (Carver, 1996). It is important to consider that the educator is also a student in the reciprocal process of learning, as well as a role model who can "influence the experiences of students by the way they react, respond, and take action in the combination of settings in which they are viewed by students" (Carver, 1996, p. 154). Zull (2004) postulated that in order for learning to be intrinsically rewarding to students, classwork should foster progress toward a level of mastery or success and should be naturally appealing to students.

Zull (2004) stated that "students will not practice in a meaningful way unless they care" and that "ultimately, the learner is in control" (p. 73). In order to foster a learning environment conducive to experiential learning, Kolb (2015) proffered three goals to aid in the quest to becoming an experiential educator: 1) to create spaces for learning, 2) to match individual's preferred learning styles with subject matter

requirements, and 3) to focus on the development of learning skills (p. 288). Further elucidating upon the concept of learning spaces, Kolb and Kolb (2005) advocated that learning spaces should be hospitable; should encourage conversational learning, expertise development, and inside-out learning; should provide opportunities for acting, reflecting, feeling, and thinking; and should allow for students to take charge of their own learning. Learners construct their own knowledge, but the role of educators is integral for effectively facilitating and stimulating the learning process.

The Spiral of Experiential Learning

According to Kolb (2015), successful educators are able to organize their educational activities in such a way that all four learning modes are addressed – experiencing, reflecting, thinking, and acting – and are thereby able to "teach around the learning cycle" (p. 301). Often, this cycle is completed in a recursive fashion, effectively becoming a learning spiral (Figure 2.5) where each new experience created becomes "richer, broader, and deeper. Further iterations of the cycle continue the exploration and transfer to experiences in other contexts" (Kolb, 2015, p. 301; Kolb & Kolb, 2009). Each trip through the learning cycle reiterates the experiential process, thus leading to learning development (Kolb & Kolb, 2012).

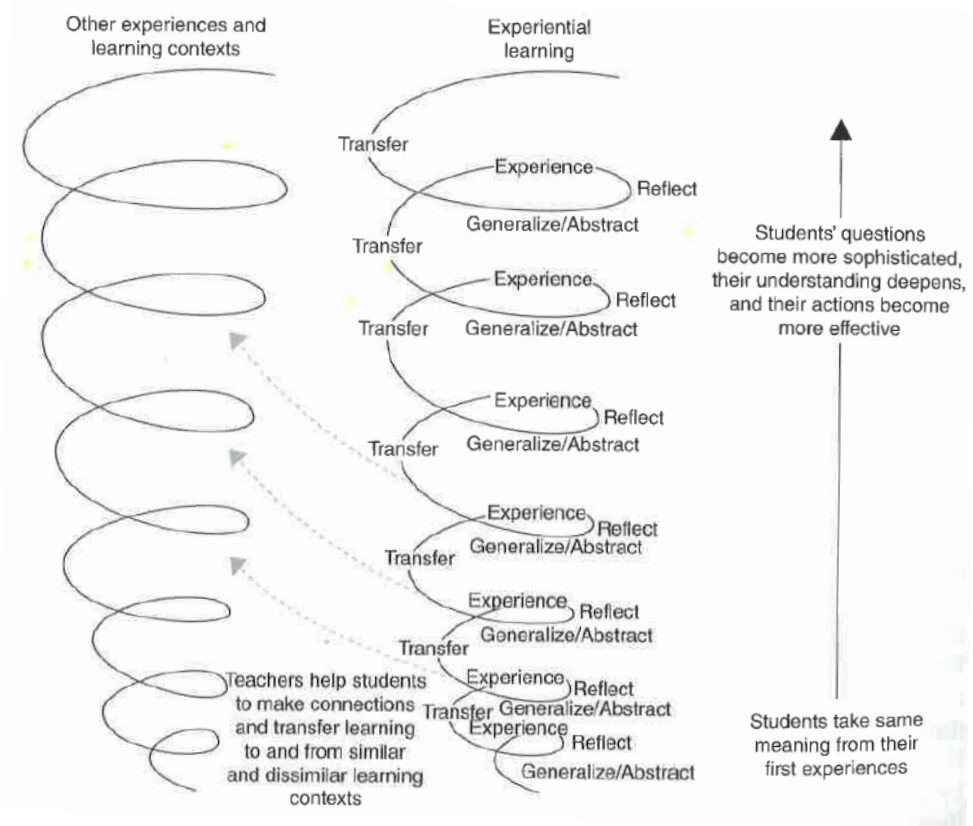

Figure 2.5. The Experiential Learning Teaching and Learning Spiral. Reprinted from Experiential Learning: Experience as the Source of Learning and Development, 2nd, (p. 302), by David A. Kolb, 2015, Upper Saddle River, NJ: Pearson Education, Inc. Copyright 2015 by Pearson Education, Inc. Reprinted with permission.

Experiential Learning in Agricultural Education

Since its inception, agricultural education has been rooted in experiential learning (Baker, Robinson, & Kolb, 2012; Knobloch, 2003; Roberts, 2006; Smith & Rayfield, 2017). Epistemologically, experiential learning aligns with constructivism, which posits that knowledge is constructed by the learner through experience (Doolittle & Camp, 1999; Phipps, Osborne, Dyer, & Ball, 2008; Roberts, 2006). Phipps et al. (2008) posited that in order for students to construct their own knowledge of a topic, "students must become emotionally engaged (curious, motivated, puzzled, determined)," (p. 223) and must "think deeply, raise questions, seek answers and solutions, experiment, draw

conclusions, make decisions, evaluate, and engage in many other thinking and analysis processes" (p. 223).

Experiential learning is considered an important pedagogical approach used within the broad family of secondary agricultural education, as the discipline lends itself so naturally to experiential opportunities (Baker & Robinson, 2016; Baker, Robinson, & Kolb, 2012; Roberts, 2006). Baker et al. (2012) postulated that Kolb's (1984) experiential learning model naturally aligns with the traditional three-circle agricultural education model, comprised of instruction, FFA, and SAE (supervised agricultural experience). Within the context of agricultural education, experiential learning should: "(a) encompass each of the three components of the agricultural education model, (b) require purposeful and planned support from the agricultural education instructor, (c) lead to the development of important meta-cognitive skills, and (d) include curriculum planning and assessment" (Baker et al., 2012, p. 6).

While a relatively limited sphere of research exists within the discipline of agricultural education related to the effects of experiential learning methods on learning (Baker, Robinson, & Kolb, 2012), several studies have emerged within recent years that contribute to this body of knowledge (Baker & Robinson, 2016, 2018; Baker, Brown, Blackburn, & Robinson, 2014; Mabie & Baker, 1996; Smith & Rayfield, 2017). Baker and Robinson (2016) analyzed agricultural education students participating in a wind energy day camp, who were grouped by exposure to either an experiential learning or direct instruction instructional approach. Both treatment groups were measured across three domains – practical, analytical, and creative intelligence. The researchers found that students who received the experiential learning treatment produced higher creativity

scores and practical knowledge scores than did their direct instruction counterparts. However, similar analytical knowledge scores were achieved for both groups, regardless of treatment. In order to achieve balanced growth and development in learning, it was recommended that a blended approach of instruction, combining both experiential and direct instructional approaches, be utilized (Baker & Robinson, 2016).

Building on their previous work, Baker & Robinson (2018) again examined the effects of utilizing the contrasting pedagogies of experiential learning and direct instruction, but specifically analyzed students' retention of agricultural knowledge over time. Utilizing a six-week deferred post-test to examine analytical scores associated with participation in a wind energy day camp, the researchers found that scores increased significantly for both treatment groups after participation in the training, with those participants receiving the direct instruction approach outperforming the experiential learning group. This was followed by a significant decrease in analytical scores for both treatment groups six-weeks after participation in the training, implying that special attention should be paid to mastery of content learned (Baker & Robinson, 2018).

Baker, Brown, Blackburn, and Robinson (2014) utilized an experimental design to determine the effects of the order of abstraction (either pre-abstraction or post-abstraction) and type of reflection (reflection-in-action or reflection-on-action) have on students' knowledge acquisition scores. The researchers found that order of abstraction did not have a significant effect on students' knowledge scores, yet the type of reflection, specifically reflection-in-action, by providing continuous opportunities for reflection during the teaching process, did produce a significant effect.

In a similar approach, Smith and Rayfield (2017) examined cognitive sequencing of instruction within the dimension of grasping information through experiential learning theory. Utilizing a quasi-experimental crossover design, students participated in two STEM-based lessons; one beginning with a concrete experience followed by abstract conceptualization, and the other following in the opposite sequence. The researchers found significant interactions for both units of instruction between students' identified preference for grasping information (either grasping via apprehension or grasping via comprehension) and the cognitive sequencing of instruction (Smith & Rayfield, 2017).

In a comparison of two differing agriculturally-oriented experiential instructional strategies, where one treatment group participated in an ongoing gardening project for ten weeks and another group participated in three short, in-class projects (bread-baking, chick rearing, and seed germination), Mabie and Baker (1996) found that students participating in the experiential activities had greater increases in science process skills then did students in a control group. Additionally, participation in the short, in-class projects group resulted in greater gains in science process skills than the ongoing gardening project group (Mabie & Baker, 1996).

CHAPTER III

METHODOLOGY

The purpose of this chapter is to describe the methods and procedures followed to conduct the study. This chapter is segmented based on the two separate populations examined for this study; a description of each population and the research design utilized for each group is provided. The chapter also includes a detailed description of the survey instrument utilized for data collection, in addition to the data collection processes and the methods utilized for data analysis. The chapter concludes with a discussion of controlling threats to both internal and external validity.

Purpose of the Study

Injuries and fatalities related to ATV usage among youth has been identified as an ongoing concern for not only the state of Oklahoma, but also the nation. While studies related specifically to ATV usage behaviors have been conducted, there is less literature related to the effects ATV safety-related trainings have on youths' ability to exhibit safe and responsible riding behaviors. This study will seek to examine ATV usage behaviors among youth in Oklahoma and will also determine the impact ATV safety trainings have on youths' knowledge and behaviors related to ATV safety.

Survey Instrument

The questionnaire utilized for this study was adapted, with permission, from a survey instrument developed by Novak, Hafner, Aldag, and Getz (2013), who utilized a one-group pre-test/post-test design to examine students who had participated in an ATV safety presentation. Due to the survey's use and subsequent analysis within the field of medicine, the questionnaire was modified slightly for use in this study. The modified survey contained five sections that were designed to describe: a) demographic characteristics, b) ATV usage behaviors, c) ATV-related injury prevalence, d) previous attendance of ATV-related safety trainings, and e) knowledge related to ATV safety. Item response format varied, using multiple choice, fill-in-the-blank, and Likert-type items based on a scale where 1 = "I did not ride an ATV during the past 3 months," 2 = "Never [performed behavior] (0 out of 10 rides)," 3 = "Rarely [performed behavior] (1-2 out of 10 rides)," 4 = Sometimes [performed behavior] (3-6 out of 10 rides)," 5 = Most of the time [performed behavior] (7-9 out of 10 rides)," and 6 = "Always [performed behavior] (10 out of 10 rides)."

Face and content validity of the instrument were established through review by an expert panel (Litwin, 2003), consisting of five university faculty members (four from Oklahoma State University and one from the University of Arkansas), two ASI-certified ATV safety instructors (one from the Oklahoma State University Cooperative Extension Service and one from the Oklahoma State Department of Health), an epidemiologist from Injury Prevention Service of the Oklahoma State Department of Health, and the Oklahoma 4-H ATV Safety Program state coordinator. Owing to Novak et al.'s (2013) study being conducted in Illinois, several of the ATV-related behavior questions were

modified to reflect machines that are more commonly used in Oklahoma, (i.e. "snowmobiles" were replaced with "side-by-sides").

Litwin (2003) recommended incorporating the use of graphics to vary survey response sets. Visual images were added of each motorized vehicle (ATVs, side-by-sides, and minibikes/trailbikes/dirt-bikes) to not only vary response sets, but to also increase visual readability for the youth populations under study. Radhakrishna (2007) advised conducting a readability test to enhance questionnaire validity. The Flesch-Kincaide readability value for the initial instrument was 6.8. Several questions were reworded for clarity; the final version of the questionnaire had a Flesch-Kincaide grade level score of 6.2. Several questions were added to the sections on ATV usage behaviors and ATV safety knowledge to reflect the five key behaviors examined for this study (helmet use, safety equipment/riding gear use, riding and/or operating with passengers, riding on public roads and/or highways, and riding inappropriately sized machines).

Prior to conducting the pre-test data collection phase, a pilot test was conducted at Ripley Elementary School in Ripley, Oklahoma. According to Litwin (2003), pilot-testing serves as an opportunity to pre-test a survey instrument with a small sample population and has the benefit of allowing the researcher to: 1) identify any potential errors in the survey, 2) determine where the instrument may need redesigning, and 3) can predict potential problems that may be encountered when administering the instrument. Pilot-testing allows the researcher to correct any errors before the survey is "mass-produced or used on a wider-scope to gather real data" (Litwin, 2003, p. 58).

Ripley Elementary School was purposively chosen based on its proximity to both the researcher and the upcoming Oklahoma Wildlife Expo (Study I). A school-based

ATV safety training, the same format that was utilized for the Coyle Middle/High school population (Study II), was conducted at Ripley Elementary School on September 18, 2017. Prior to participating in the training, students completed the pre-test survey instrument during their homeroom class period.

After reviewing the surveys collected during the pilot-test phase, several formatting errors were corrected. Two questions were deemed as non-essential for the purposes of this particular study and were removed. The final survey instrument consisted of 25 questions.

Reliability of the instrument pertaining specifically to behavioral questions was determined post hoc using Cronbach's alpha coefficient for reliability estimates. Creswell (2008) advised looking for positive coefficients of at least .60 or above. Cronbach's alpha indicates high reliability for questions designed to measure the construct of ATV-related behaviors ($\alpha = .809$). Reliability of the instrument pertaining specifically to knowledge-related questions was determined post hoc using the Kuder-Richardson 20 (*KR20*) formula, a test for internal consistency used commonly with dichotomous level data (Gregory, 2011). The instrument produced the following reliability coefficients (*KR20*) for the five knowledge-related questions: (a) .368 for the pre-test, and (b) .449 for the post-test. An alpha level of .05 was established *a priori* for all statistical tests.

Despite the relatively low *KR20* values established for the knowledge-related questions in the instrument, the researcher elected to proceed with data collection due to a potential concern with response fatigue. As the instrument was designed to capture several aspects of ATV usage, the amount of time necessary for youth to complete the 25-question instrument was approximately 15 minutes. For the youth populations

examined for this study, it was believed that taking additional time to administer a separate knowledge exam would be met with higher attrition rates.

Population

The target population (Dillman, Smyth, & Christian, 2014) for this study consisted of all youth aged 18 years and younger who potentially operate all-terrain vehicles in the state of Oklahoma. The population (Dillman et al., 2014) was narrowed to two units between youth who participated in an ATV safety training with an actual riding component and youth who participated in a school-based ATV safety training, minus the riding component. The two units selected for this study included: 1) youth who voluntarily elected to participate in an ATV safety training held at the 2017 Oklahoma Wildlife Expo (n = 95), and 2) youth in grades 6 – 12 who participated in a school-based ATV safety training at Coyle Middle/High School (n = 155) (Table 1). A detailed description of each population, as well as the research design and data analysis methods used for each group follows.

Table 3.1

Study Population by Group (N = 250)

	Frequency
Study 1: Oklahoma Wildlife Expo	95
Study 2: Coyle Public Schools, 6^{th} – 12^{th} Grade	155

Study I: Youth Participating in an Interactive ATV Safety Training at the Oklahoma Wildlife Expo

Description of Population

The first population examined for this study consisted of youth from across the state of Oklahoma who voluntarily elected to participate in an ATV safety training

offered at the 2017 Oklahoma Wildlife Expo, held September 23rd and 24th in Guthrie, Oklahoma. Over a two-day period, 112 participants completed the two-hour training. Prior to the beginning of the training, participants completed a self-reported questionnaire designed to measure ATV-related behaviors and knowledge. Several parents completed the ATV safety training with their children, as well as several other adults (n = 8) who had not previously operated an ATV before. As the focus of this study was to examine ATV-related behaviors and knowledge of youth populations, all surveys completed by participants older than age 18 (n = 5) were excluded from analysis. Of the 104 youth participants, nine youth did not complete a survey in its entirety and were excluded from analysis, yielding a total of 95 usable questionnaires.

Research Design

This population was examined using a non-experimental, one-group survey research design (Privitera, 2017). Non-experimental research is utilized to make observations in which a behavior or event is observed without an intervention or manipulation (Privitera, 2017). According to Privitera (2017), a survey research design is a type of non-experimental research used "to describe an individual or a group by having participants complete a survey or questionnaire" (p. 238). While surveys are utilized in many types of research designs within the social sciences, the survey research design is used specifically to "quantify, describe, or characterize an individual or a group" (Privitera, 2017, p. 238).

Data Collection

Presented by the Oklahoma Department of Wildlife Conservation, the Oklahoma Wildlife Expo allows youth from across the state to participate in a wide variety of

outdoor-related activities, ranging from camping and outdoor survival, to shooting sports, fishing, and bird watching (Oklahoma Department of Wildlife Conservation, 2017). A large array of outdoor and wildlife conservation agencies and educational organizations are present each year at the Expo, giving youth the opportunity to participate in interactive experiences and gain useful life skills.

The ATV Ride Safe Oklahoma Coalition has participated in the Expo since 2015, by providing an interactive ATV safety training where youth can learn to operate an ATV in a safe and controlled environment. The training offered at the Expo was an abbreviated version of the ATV Safety Institute (ASI) *RiderCourse* training, which typically lasts five hours and covers 16 lessons. The abbreviated version offered at the Expo lasted approximately two hours and was offered in four sessions each day throughout both days of the Expo. The lessons included: Lesson 1 - Introduction to the ATV *RiderCourse*, Lesson 2 - Range Signals, Rules, and Warm-Up Exercises, Lesson 3 - Controls/Starting the Engine, Lesson 4 - Starting Out, Shifting Gears and Braking, and Lesson 5 – Turning. During the first lesson, special attention was given to outlining the five key risk factor areas associated with ATV use, and which served to guide the research objectives of this study: (a) helmet use, (b) carrying passengers, (c), riding on public roads and/or highways, (d) safety gear use, and (e) riding adult-sized ATVs. Similar to the full-scale *RiderCourse* training, the abbreviated training was conducted by ASI-licensed ATV instructors; several licensed instructors from across the state assisted with conducting the trainings during the Expo.

The Wildlife Expo was chosen as a unit of analysis for this study owing to the ability to reach a large number of youth from across the state at one time. In the full-scale

RiderCourse training, each instructor can oversee eight students at a time, i.e. two instructors can oversee a class size of 16. Because of the detailed logistics associated with offering a full-scale course, one training will reach only a relatively small number of students at a time. In order to reach a larger population, while still offering the riding component of the *RiderCourse* training, it was determined that the Wildlife Expo would serve as an appropriate training opportunity.

Prior to each two-hour training session, participants completed a youth assent form (Appendix E), along with the pre-test survey instrument adapted from Novak et al. (2013), titled "Pre-Intervention Off-Road Vehicle Survey" (Appendix A), where participants self-reported their behaviors and knowledge related to ATV use. The survey took approximately ten minutes to complete. Parents were required to complete a parent consent form (Appendix F), allowing their child to complete the pre-test survey instrument and also provide additional contact information in the form of an address and/or e-mail address, indicating that they would allow their child to complete a post-test survey instrument three months after the completion of the ATV training.

Post-test survey data were collected approximately three months after the training took place. As the survey instrument was designed to measure a change in ATV-related behaviors and retention of ATV-related knowledge, the researcher elected to test participants after a three-month interval, as opposed to immediately following completion of the trainings.

For participants who had completed the ATV training held at the Wildlife Expo, post-test data were collected following Dillman et al.'s (2014) mixed-mode questionnaire and survey implementation recommendations. As opposed to using a single-mode survey

method, a mixed-mode survey method often has the benefit of lower costs, improved timeliness, reduced coverage error, improved response rates, and reduced nonresponse and measurement errors (Dillman et al., 2014).

Owing to the diversity of the population sampled at the Expo, it was determined that a mixed-mode approach would be beneficial for several reasons, the first being that respondents had the option to provide a mailing and/or e-mail address as their preferred method of contact for the post-test survey distribution. As some participants only indicated one mode of contact, it was necessary to distribute the post-test survey via a Qualtrics web survey, as well as a mailed paper survey, known as a *web-first* or *web+mail* design (Dillman et al., 2014). As per Dillman et al.'s (2014) guidelines, this method has been shown to increase response rates substantially, as opposed to a *mail-first* design.

Utilizing a mixed-mode approach was also beneficial for this study due to reduced survey costs. Dillman et al. (2014) noted that "many mixed-mode survey designs begin with less expensive modes and then move to more costly modes for those who do not respond initially" (p. 401). Due to low response rates via the initial and subsequent Qualtrics web-link, a mailed copy with a postage paid return envelope was distributed, followed by a mailed copy with a postage paid return envelope and a $2 cash incentive (Table 3.2). When using monetary incentives, Dillman et al. (2014) recommended an amount between $1 and $5, as small cash incentives have been shown to increase survey response rates.

Table 3.2

Timeline for Distribution of Post-Test Survey for Wildlife Expo Population

Week	Procedure
Week One	Online Qualtrics survey
Week Three	Online Qualtrics survey
Week Four	Mailed survey
Week Twelve	Mailed survey with $2 cash incentive

In accordance with several of the guidelines proposed by Dillman et al. (2014), the same question format and wording, as well as visual format, were used across both the web-based and paper-based surveys. For the web-based survey, steps were taken to ensure that respondents were not forced to answer any question they did not wish to respond to and respondents had the option to stop the survey and complete it at a later time. For both the web- and paper-based surveys, all correspondence was personalized to each respondent.

Analysis

Data were input and analyzed using the *Statistical Package for the Social Sciences v. 21.0*. Data associated with all research objectives were analyzed using descriptive statistics, including frequencies and percentages.

Study II: Youth Participating in a School-Based ATV Safety Training at Coyle Middle/High School

Description of Population

After data were collected for all participants who completed the ATV safety training at the Wildlife Expo, the average age of the participants was calculated, yielding a mean age of 12.30 (i.e. 7^{th} grade). This mean was then utilized to determine what age group should be targeted for the second data collection phase of the study: a middle

school-aged population who would participate in a school-based ATV safety training. Considering the training schedule for the Oklahoma ATV Safety Coordinator, who schedules and facilitates the majority of ATV trainings in the state, several centrally-located middle schools who would have a population size approximate to the number of participants who completed the ATV safety training at the Oklahoma Wildlife Expo, were approached as potential participants for the study. Coyle Middle/High School agreed to host an ATV safety training and allow students to complete the pre- and post-test survey instruments.

Coyle Middle/High School is a rural public school system located in northeastern Oklahoma. The district population consists of 3,940 inhabitants (Oklahoma School Profiles, 2016). Students are reported as being predominantly Caucasian (70%) or Black (30%). Over half of the school's population (52%) is considered eligible for free/reduced lunch (Oklahoma School Profiles, 2016).

All students in grades 6 – 12 who were in school that day attended the ATV safety training (N = 155) and completed a self-reported pre-test questionnaire. A post-test questionnaire was completed approximately three months after the ATV safety training took place. A total of 148 pre-test questionnaires (95.5% response rate) were returned prior to the beginning of the training. Seven students either did not complete a survey or did not complete the pre-test survey in its entirety, thereby resulting in exclusion from analysis. One hundred twenty-nine post-test questionnaires (83.2% response rate) were returned. A total of 122 questionnaires (both pre- and post-test responses collected) were deemed usable for analysis, yielding an overall response rate of 79.0%.

Research Design

This population was examined using a quasi-experimental one-group pre-test/post-test design (Privitera, 2017). According to Creswell (2009), in quasi-experiments, "the investigator uses control and experimental groups but does not randomly assign participants to groups (e.g., they may be intact groups available to the researcher)" (p. 159). In a one-group pre-test/post-test design, the researcher is able to measure scores both before and after a treatment, then compare the difference between the pre- and post-test scores (Privitera, 2017). This type of design is advantageous in that a researcher can compare scores after a treatment to scores measuring the same dependent variable before a treatment in the effort of determining whether or not a treatment caused a difference in behavior, knowledge, attitudes, etc. However, a disadvantage with this design is the lack of a no-treatment control group, which can pose potential threats to internal validity, such as those attributed to testing the same participants over time (Privitera, 2017). Table 2 depicts the research design utilized for examining this population.

Table 3.3

One-Group Pre-Test/Post-Test Design for Participants in a School-Based ATV Training (N = 155)

Coyle Middle/High School Students	O_1	X	O_2

O_1: Measurement (pre-test) before completing ATV safety training
X: Treatment – School-based ATV safety training
O_2: Measurement (post-test) approximately three months after completing ATV safety training

Data Collection

The ATV safety training conducted at Coyle Middle/High School took place on October 23, 2017. The training consisted of a Microsoft PowerPoint presentation,

highlighting the definitions of various types of ATVs and side-by-side machines, appropriate safety gear, machine fit guidelines and age/size recommendations, and safe riding strategies. The PowerPoint was coupled with examples of appropriate riding gear, static demonstrations using an adult-model ATV, two Public Service Advertisements (PSA's) related to the "Golden Rules of ATV Safety," (ATV Safety Institute, 2016), and a short film highlighting a local ATV accident survivor. At the conclusion of the training, students received a "Safe Riding Tips" brochure and were encouraged to complete the online ASI ATV safety e-course (ATV Safety Institute, 2016). The training was conducted on school property, during school hours.

Unlike data collection for the Wildlife Expo participants, where both a child-assent form and a parent-consent form were completed, data collection for the Coyle population entailed the distribution of a parent opt-out form (Appendix G), which was distributed to parents by the school superintendent via the Remind app the same week the ATV safety training took place. Parents were required to complete the form only if they did not wish for their child to participate in the study. Prior to the training, students in grades 6 - 12 completed the youth assent form (Appendix E) and the self-reported pre-test questionnaire (Appendix A) adapted from Novak, Hafner, Aldag, and Getz (2013), titled "Pre-Intervention Off-Road Vehicle Survey," during their homeroom class periods.

Post-test survey data were collected approximately three months after the training took place. As the survey instrument was designed to measure a change in ATV-related behaviors and retention of ATV-related knowledge, the researcher elected to test participants after a three-month interval, as opposed to immediately following completion

of the trainings. The researcher administered the post-test survey on school property, during school hours.

Analysis

Data were input and analyzed using the *Statistical Package for the Social Sciences v. 21.0*. Data associated with objectives one and two were analyzed using descriptive statistics, including frequencies and percentages. Paired-sample t-tests were employed to analyze the third and fourth objectives of this study.

Controlling Threats to Validity

According to Litwin (2003), "in any set of data you collect, there will be some amount of error" (p. 5). As a researcher, it is important to minimize this error as thoroughly as possible in order to provide an accurate reflection of the truth (Litwin, 2003). When examining internal and external validity, Privitera (2017) recommended thinking of research design "along a gradient of control" (p. 174), where experimental designs have the highest degree of control (internal validity), and non-experimental designs have the lowest amount of control. External validity refers to the extent to which observations are generalizable beyond the confines of the study (Privitera, 2017).

Internal Validity

According to Creswell (2008), internal validity threats are "experimental procedures, treatments, or experiences of the participants that threaten the researcher's ability to draw incorrect references from the data about the population in an experiment" (p. 162). Factors that threaten a study's internal validity include history, maturation, regression, testing effects, selection, mortality, heterogeneous attrition, and instrumentation and measurement (Creswell, 2009; Privitera, 2017).

History effects refer to unanticipated events that can occur during the course of the experiment, which can unduly influence the outcome of the study (Creswell, 2009). Maturation effects refer to changes that can occur which alter a participant's psychological or physiological state over time (Privitera, 2017). For the Wildlife Expo population, history and maturation effects were controlled by only collecting data at one point in time. For the Coyle school-based population, history and maturation effects were controlled by administering the pre- and post-test instruments over a relatively short amount of time.

Regression effects occur when participants with extreme scores at one point in time shift toward a score or closer to a mean that is more indicative of the individual's true ability a second time (Privitera, 2017). Testing effects refer to improved performance on a test due to having already seen the same test previously (Privitera, 2017). Selection effects refer to participants who are selected based on certain characteristics (Creswell, 2009). For the Wildlife Expo population, participants voluntarily elected to participate in the ATV training; a census sample was utilized for the Coyle population, where every student present the day of the ATV training attended. Regression effects were controlled as extreme behavior or knowledge scores were not known prior to participation in the training. Participants were not selected based on certain characteristics. Testing effects were controlled by administering the post-test survey approximately three months after the training was completed in the hope that student responses reflected knowledge gained and behaviors changed.

Mortality effects, also known as attrition, occur when participants fail to show up for a study or drop out during the course of the experiment (Creswell, 2009; Privitera,

2017). A specific type of attrition that this study was susceptible to is known as heterogeneous attrition, "which occurs when attrition rates in one group are more or less than attrition rates in another group" (Privitera, 2017, p. 186-187). As a census population was utilized for the Coyle population, all students who were present the day of the training completed a pre-test. Owing to a school-based population being sampled, a high post-test response rate was expected. As Wildlife Expo participants were asked to complete the survey instrument before participating in the ATV safety training, a high-response rate was also expected.

Instrumentation and measurement effects can occur when the instrument utilized to measure the dependent variable changes due to error, thereby effecting the outcome of the experiment (Creswell, 2009; Privitera, 2017). Instrumentation effects pertaining to the Coyle population were controlled by using the same survey instrument for both the pre- and post-tests.

External Validity

According to Creswell (2009), "external validity threats rise when experimenters draw incorrect inferences from the sample data to other persons, other settings, and past or future situations" (p. 162). External validity threats are attributable to the characteristics of the participants selected for the study, the setting, and the timing of the experiment (Creswell, 2009). These threats can limit the extent to which the results of the experiment are generalizable beyond the confines of the study (Privitera, 2017). Threats to external validity include population, ecological, and temporal validity (Privitera, 2017).

Population validity refers to the extent to which the results of a study are generalizable to the target population from which the sample population was selected (Privitera, 2017). In the case of this study, the target population consisted of youth who operate ATVs in the state of Oklahoma. Two sample populations were examined: 1) youth who voluntarily elected to participate in an interactive ATV safety training, and 2) youth who participated in a school-based ATV safety training. Youth from across the state of Oklahoma attended the Wildlife Expo, making this group relatively generalizable to the target population. The school-based population, however, was limited to one school in the state of Oklahoma, thereby limiting generalizability to the target population. It is recommended that replications of this study be conducted at multiple schools across the state of Oklahoma to enhance population generalizability.

Ecological validity refers to "the extent to which results observed in a study will generalize across settings or environments" (Privitera, 2017, p. 190). Ecological validity is considered high when the research is conducted in a natural setting and is not dependent on, or limited to, specific features of the research setting itself (Privitera, 2017). Data collection for the Wildlife Expo occurred in a natural setting – participants already in attendance at the Expo voluntarily elected to participate in the ATV safety training. While the researcher organized the ATV safety training held at Coyle Middle/High School specifically for the purposes of this study, the school-based ATV safety training has been offered at many schools across the state and lends itself well to future replication.

Lastly, temporal validity refers to the extent to which results are generalizable across time (Privitera, 2017). When examining temporal validity, results are considered

generalizable when they are stable, constant, or steady over time, or at different points in time (Privitera, 2017). To enhance the temporal validity of this study, the researcher elected to administer the same pre- and post-test survey instruments over a three-month interval in order to measure if participant behaviors and knowledge related to ATV usage changed.

CHAPTER IV

STUDY I

AN EXAMINATION OF AN EXPERIENTIAL ALL-TERRAIN VEHICLE (ATV) SAFETY TRAINING AMONG SELECTED OKLAHOMA YOUTH

Introduction

The first ATV in the United States was introduced in 1970 by Honda Motor Company and was a seven-horsepower, three-wheeled vehicle known as the US90, or ATC90 (All-Terrain Cycle) (Honda Media Newsroom, 2004). Other ATV manufacturers, including Honda, soon offered variations of three-wheeled vehicles, followed shortly thereafter by the first four-wheeled vehicles in the 1980s (Tuttle, 2014). With their low cost and wide versatility, ATV sales skyrocketed, with approximately two million machines in use nationwide in 1993, and over 10 million machines by 2010 (Yuma, Maxson, & Brown, 2006; U.S. CPSC, 2005; U.S. GAO, 2010).

Because three-wheeled ATVs have a high center of gravity and lack of stability, they were found to be unstable and dangerous (DeLisle, Laberge-Nadeau, & Brown, 1988). The new four-wheeled vehicles helped initiate the decline of the three-wheeler era, which ended in 1987 when the Consumer Product Safety Commission (CPSC) sued ATV manufacturers due to safety concerns with the vehicles (Tuttle, 2014; Yuma et al., 2006). This lawsuit resulted in a 10-year ban, which "mandated that manufacturers would halt

the production of three-wheeled ATVs, recommend engine size and rider restrictions, ensure that dealers comply with age recommendations, and promote public awareness of the hazards of ATVs" (Yuma et al., 2006, p. 67-68). Evaluations have revealed that the decree was largely unsuccessful in reducing the prevalence of ATV-related injuries (Yuma et al., 2006). A positive outcome of the decree, however, was the resulting push for ATV safety educational campaigns (American Academy of Pediatrics, 2000). When the decree expired in 1998, the CPSC entered into a voluntary ATV Action Plan with ATV manufacturers, which stipulated strategies similar to those outlined in the original decree (Bansal, Fortlage, Lee, Kuncir, Potenza, & Coimbra, 2008).

While preliminary ATV models were typically classified as sport models, built for performance, by the mid to late 1980s, utility-type ATVs were becoming increasingly popular in the agricultural industry as a substitute for pick-up trucks and horses (ATV Quad News, 2017; Tuttle, 2014; Murphy & Harshman, n.d.). According to a 2008 industry survey of ATV owners, 79% of respondents reported using ATVs for recreation, while 21% used ATVs for work or chores (U.S. GAO, 2010). In remote areas, such as Alaska, ATVs were even reported as being the predominant method of transportation (U.S. GAO, 2010).

With interest in the use of ATVs for both recreation and racing, engine sizes quickly grew from the 70 cc and 90 cc models of the 1970s, to the 700 cc and higher engine models (Yuma et al., 2006). Today's models continue to be designated as either "sport" or "utility." Sport models are generally small and light, with manual transmissions that allow the vehicle to accelerate quickly up to speeds of 90 miles per hour (ATV Quad News, 2017). Utility-type ATVs are often large, four-wheel drive

vehicles that are capable of speeds up to 70 miles per hour and can also be used for agricultural and ranching activities, such as hauling small loads with attached racks or trailers (ATV Quad News, 2017).

The ATV Safety Institute (2017) defines an ATV as "a motorized off-highway vehicle designed to travel on four low-pressure or non-pneumatic tires, having a seat designed to be straddled by the operator and handlebars for steering control" (para 1). Due to the machine's having low-pressure tires (usually between 2-10 psi, depending on the manufacturer's recommendations), ATVs are not designed to be used on paved surfaces, as pavement may seriously affect the machine's handling ability and level of rider control (Specialty Vehicle Institute of America, 2014). As the name implies, ATVs are intended for off-road, all-terrain use (Jones & Bleeker, 2005).

According to the most recently published Consumer Product Safety Commission 2016 Annual Report of ATV-Related Deaths and Injuries (2017), from 1982 to 2016, 3,232 ATV-related fatalities of children younger than 16 years of age were reported, representing 22% (14,653) of the total number of reported ATV-related fatalities during that same time period. As of 2013, the most recent year where reporting is considered complete, 12% of the reported 590 ATV-related fatalities occurred with children younger than 16 years of age (U.S. CPSC, 2017). In a study conducted by Cvijanovich, Cook, Mann, and Dean (2001), the researchers found that "children had significantly higher injury rates than adults, indicating that operating or riding on ATVs carries a particularly high risk of injury to children" (p. 634). According to Jones and Bleeker (2005), many of the ATV-related injuries among youth have occurred when "the operator lost control, the

vehicle rolled over, the operator or passenger was thrown off, or there was a collision with a fixed object" (p. 70).

In a report from the Oklahoma State Department of Health (Wendling, 2007) on hospitalized and fatal ATV-related injuries in Oklahoma for the year 2007, 198 youth sustained ATV-related injuries, 12 of whom died. Of the survivors, only 13% of youth were documented to be wearing a helmet. The highest number of injuries and fatalities occurred with youth 16 years of age and older. Of the cases where the accident circumstances were known, over one-quarter collided with a fixed/stationary object and 7% collided with a moving object, such as another ATV or a licensed motor vehicle. Fifty-two percent of the reported injuries involved the ATV rolling over and over a third of those individuals were struck or crushed by the ATV (Wendling, 2007).

When examining educational interventions related to childhood injury prevention, community-based approaches have been found to be effective (DiGuiseppi, Rivara, Koepsell, & Polissar, 1989; Towner & Dowswell, 2002). According to Towner and Dowswell (2002), "the use of multiple interventions implemented over a period of time can allow injury prevention messages to be repeated in different forms and contexts and can begin to develop a culture of safety within a community" (p. 282). Important elements of community-based programs include having a long-term strategy, effective and focused leadership, and multi-agency collaboration (Towner & Dowswell, 2002).

In an evaluation of a community-wide bicycle helmet campaign conducted in Seattle, Washington, researchers found that the campaign, which sought to increase parental awareness, promote helmet use by children, and reduce financial barriers to the purchasing of helmets, resulted in a significant increase in helmet use (DiGuiseppi et al.,

1989). To raise parental awareness, the campaign utilized public service announcements on both TV and radio, press conferences, television programs, print articles and pamphlets, and numerous presentations at community-based events (DiGuiseppi et al., 1989). To promote helmet use by children, a bicycle safety program was taught in numerous Seattle elementary schools, which included incentives for children who wore helmets at various bicycling events, such as posters, stickers, and coupons for McDonald's french fries and Seattle Mariners baseball tickets (DiGuiseppi et al., 1989). To offset helmet costs, the campaign distributed coupons to physicians' offices, schools, youth groups, and various community events (DiGuiseppi et al., 1989).

In a similar examination of bicycle helmet use among youth, Morris and Trimble (1991) compared three schools that received either no educational intervention (the control school), a helmet awareness program intervention (the education-only school), or an intervention plus an opportunity to purchase bicycle helmets at a substantially reduced price (the subsidized school). The researchers concluded that while education and awareness-raising alone did not affect any change in bicycle helmet use, the subsidized school exhibited a significant increase in helmet use after the program, as compared to the control school, who received no training or helmet subsidy (Morris & Trimble, 1991).

Background

The ATV Ride Safe Oklahoma program is dedicated to promoting safe ATV use (ATV Ride Safe Oklahoma, 2017). The organization is a coalition comprised of the Children's Center for Rehabilitation Hospital, Trauma One at University of Oklahoma Medical Center, Oklahoma Cooperative Extension Service 4-H and Youth Development, and Injury Prevention Service through the Oklahoma State Department of Health. The

purpose of the ATV Ride Safe Oklahoma program is to promote safe and effective ATV riding practices and to reduce the number of ATV-related injuries and fatalities of youth. Both interactive and classroom-based trainings are used to have a meaningful impact on the knowledge and behaviors of ATV users by targeting the following risk factor areas: not wearing a helmet, not wearing safety gear, carrying passengers on ATVs not specifically designed for more than one person, operating ATVs on pavement and/or public roads and highways, and operating ATVs that are an inappropriate size for the rider (ATV Ride Safe Oklahoma, 2017).

As one of the main partners of the ATV Ride Safe Oklahoma program, the Oklahoma Cooperative Extension Service 4-H ATV Safety program is able to disseminate educational materials and programs through myriad outlets, including the hands-on ASI ATV *RiderCourse*^{SM} training and through ATV safety programs delivered to schools, clubs, camps, and other youth programs. The ASI ATV *RiderCourse*^{SM} training is taught by ASI certified instructors, who have completed a week-long training and demonstrated competency in instructing youth and adults on how to safely and effectively operate all-terrain vehicles. The *RiderCourse*^{SM} is a five-hour, interactive training, offered in class sizes of four to eight students. The participants are given the opportunity to increase their safety knowledge and to practice basic riding skills in a controlled environment under the direct supervision of a licensed instructor. In addition to the interactive components of the training, participants also learn about proper safety gear, local riding regulations, places to ride, and environmental concerns.

In an effort to reach a statewide audience, the Oklahoma 4-H ATV Safety program has three mobile training trailers, which can be utilized by educators anywhere

in the state to offer the interactive *RiderCourse*^{SM} training. Each trailer accommodates up to 10 ATVs, plus equipment, so participants do not have to bring, or even own, an ATV to complete the training. In addition to being used for *RiderCourse*^{SM} trainings, the trailers have been utilized at farm safety days, the Oklahoma Wildlife Expo, county and state fairs, and various other events throughout the state with high attendance by youth and adults. The Oklahoma 4-H ATV Safety Program is also able to provide community-based, in-school ATV safety educational programs, taught by trained Cooperative Extension Service educators and volunteers. Instructors are able to utilize ASI resources, such as the ASI online E-course, as well as the National 4-H ATV Safety Leader's Guide classroom curriculum. Presentations can be given to individual classes or to large, school-wide assemblies.

Theoretical Framework

Since its inception, agricultural education has been rooted in experiential learning (Baker, Robinson, & Kolb, 2012; Knobloch, 2003; Roberts, 2006; Smith & Rayfield, 2017). Experiential learning is considered an important pedagogical approach used within the broad family of secondary agricultural education, as the discipline lends itself so naturally to experiential opportunities (Baker & Robinson, 2016; Baker, Robinson, & Kolb, 2012; Roberts, 2006).

Kolb (2015) defined learning as "the process whereby knowledge is created through the transformation of experience" (p. 49). His experiential learning theory is called thus to emphasize "the central role that experience plays in the learning process" (Kolb, Boyatzis, & Mainemelis, 1999, p. 2). The process is described as "a dynamic view

of learning based on a learning cycle driven by the resolution of the dual dialectics of action/reflection and experience/abstraction" (Kolb, 2015, p. 50-51).

The intellectual origins of Kolb's (1984, 2015) experiential learning theory can be traced to the seminal works of Kurt Lewin's (1951) social psychology, John Dewey's (1938) philosophical pragmatism, and Jean Piaget's (1970) cognitive-developmental genetic epistemology (Kolb et al., 1999). Kolb's (1984, 2015) model (Figure 4.1) of experiential learning serves as an integration of the aforementioned foundational scholars' models of learning. The outer cyclical portion of the model, comprising the four learning modes of concrete experience, reflective observation, abstract conceptualization, and active experimentation, is attributed to Lewin and Dewey's models. Piaget's influence is seen in the two dialectically opposed dimensions of prehension, or grasping, and transformation, resulting in four equal adaptive learning modes: prehension via apprehension ("reliance on the tangible, felt qualities of immediate experience" p. 67) or comprehension ("reliance on conceptual interpretation and symbolic representation" p. 67); and transformation via intention ("internal reflection," Kolb, 2015, p. 67) or extension ("active external manipulation of the external world," Kolb, 2015, p. 67). Kolb (2015) stated that the premise behind these dimensions is that learning requires "both a grasp or figurative representation of experience and some transformation of that representation" (p. 68). The simple perception of an experience is not enough, something must be done with it for learning to occur.

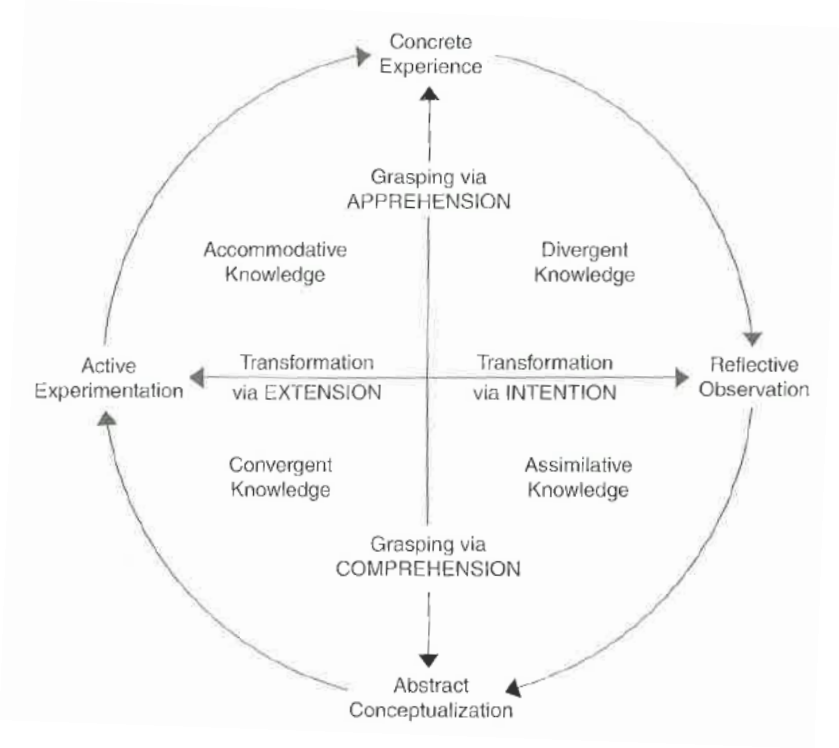

Figure 4.1. Kolb's (1984, 2015) Experiential Learning Cycle. Reprinted from Experiential Learning: Experience as the Source of Learning and Development, 2nd, (p. 68), by David A. Kolb, 2015, Upper Saddle River, NJ: Pearson Education, Inc. Copyright 2015 by Pearson Education, Inc. Reprinted with permission.

Kolb's (1984, 2015) theory is built on six assumptions of learning: 1) "learning is best conceived as a process, not in terms of outcomes" (p. 37); 2) all learning is relearning (Kolb & Kolb, 2005, p. 194); 3) "the process of learning requires the resolution of conflicts between dialectically opposed modes of adaptation to the world" (Kolb, 2015, p. 40); 4) "learning is an holistic process of adaptation to the world" (p. 43); 5) "learning involves transactions between the person and the environment" (p. 45); and 6) "learning is the process of creating knowledge" (p. 48).

Rogers (1969) asserted "there is such a thing as significant, meaningful experiential learning" (p. 4). He further defined the elements of experiential learning, stating that learning has a quality of personal involvement, is self-initiated, is pervasive,

is evaluated by the learner, and has meaning (Rogers, 1969). In experiential education, students are treated as "active participants in their own education," and are "encouraged to take the initiative to seek and learn from the expertise of those around them" (Carver, 1996, p. 153). As outlined in the principles of experiential education, defined by the Association for Experiential Education (n.d.), throughout the learning process, learners should be "actively engaged in posing questions, investigating, experimenting, being curious, solving problems, assuming responsibility, being creative, and constructing meaning" (para. 2).

The justification for using Kolb's experiential learning theory for this study is the emphasis placed on the experiences associated with an ATV safety training. According to Kolb (2015), successful educators are able to organize their educational activities in such a way that all four learning modes are addressed – experiencing, reflecting, thinking, and acting – and are thereby able to "teach around the learning cycle" (p. 301). Often, this cycle is completed in a recursive fashion, effectively becoming a learning spiral (Figure 4.2) where each new experience created becomes "richer, broader, and deeper. Further iterations of the cycle continue the exploration and transfer to experiences in other contexts" (Kolb, 2015, p. 301; Kolb & Kolb, 2009).

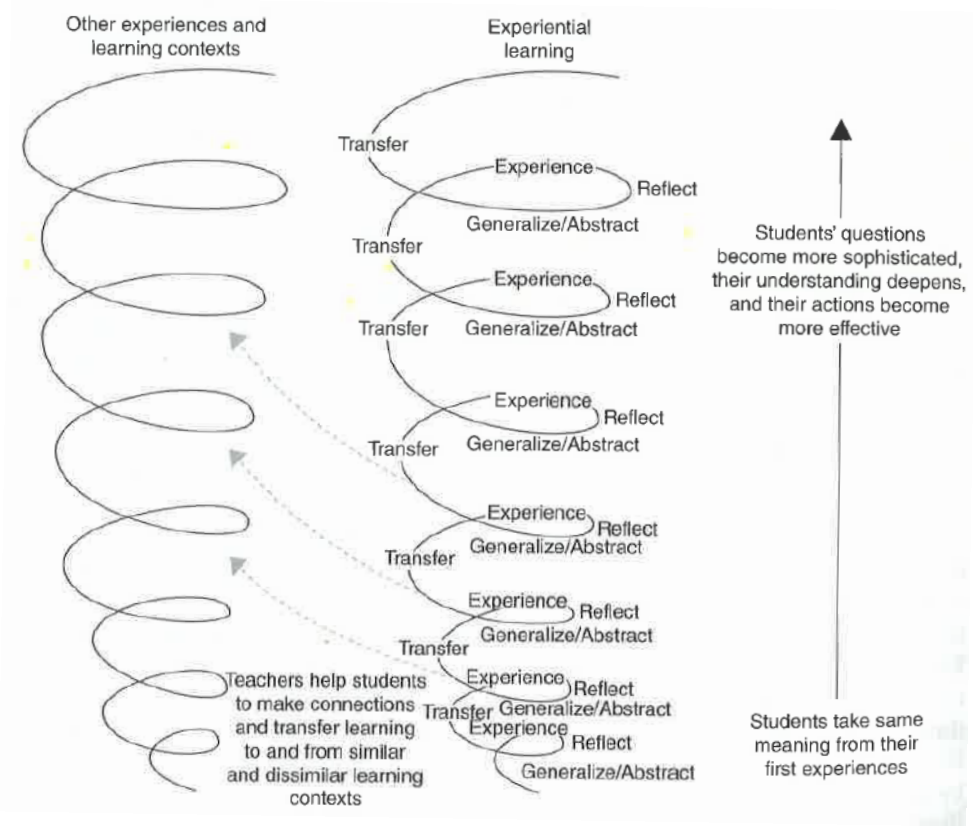

Figure 4.2. The Experiential Learning Teaching and Learning Spiral. Reprinted from Experiential Learning: Experience as the Source of Learning and Development, 2nd, (p. 302), by David A. Kolb, 2015, Upper Saddle River, NJ: Pearson Education, Inc. Copyright 2015 by Pearson Education, Inc. Reprinted with permission.

This study consisted of an interactive ATV training, where participants learned how to safely operate an ATV in a controlled learning environment by watching demonstrations before performing the experience themselves. Dale (1946) posited that "direct, purposeful experiences" are those that can be "seen, handled, tasted, felt, touched, smelled" (p. 38). Based on his Cone of Experience model, these types of experiences fall within the "observing" and "doing" categories (Dale, 1946). According to Anderson (n.d.), people generally remember 90% of what they *do* when performing a task.

Purpose and Objectives

The purpose of this study was to describe ATV usage behaviors and ATV-related knowledge of youth participating in an interactive ATV safety training. The research objectives for this study were answered using a non-experimental, one-group survey research design and were guided by the following objectives:

1. Describe the demographic characteristics of youth participating in an interactive ATV safety training, based on level of ATV-related experience;
2. Describe prevalence of ATV usage, ATV-related injuries, and previous participation in an ATV-related safety training;
3. Describe and compare participants' level of ATV-related knowledge, based on level of ATV-related experience, pertaining to:
    a. Helmet use
    b. Safety equipment/riding gear use
    c. Riding and/or operating ATVs with passengers
    d. Riding on public roads and/or highways
    e. Riding inappropriately sized machines;
4. Describe ATV usage behaviors of participants with ATV-related experience pertaining to:
    a. Helmet use
    b. Safety equipment/riding gear use
    c. Riding and/or operating ATVs with passengers
    d. Riding on public roads and/or highways
    e. Riding inappropriately sized machines;

5. Compare pre- and post-test results for participants' ATV-related behaviors and knowledge prior to and after participation in an interactive ATV safety training.

Methods and Procedures

The population for this study consisted of youth aged 10 – 18 years of age, who voluntarily elected to participate in an interactive ATV safety training offered at the 2017 Oklahoma Wildlife Expo, held September 23rd and 24th in Guthrie, Oklahoma. The Expo is an annual event sponsored by the Oklahoma Department of Wildlife Conservation, where youth can experience a wide range of outdoor-related activities. Over a two-day period, 112 participants completed the two-hour training. Before the training, participants completed a self-reported questionnaire designed to measure ATV-related behaviors and knowledge. As the focus of this study was to examine ATV-related behaviors and knowledge of youth populations, all surveys completed by participants older than age 18 were excluded from analysis. Of the 104 youth participants, nine youth did not complete a survey in its entirety and were excluded from analysis, yielding a total of 95 usable questionnaires. This study was part of a larger study to examine the impact of differing experiential ATV safety trainings on youth ATV usage behaviors and knowledge.

Instrument

The questionnaire utilized for this study was adapted, with permission, from a survey instrument created by Novak, Hafner, Aldag, and Getz (2013), who utilized a one-group pre-test/post-test design to examine students who had participated in an ATV safety presentation. The modified questionnaire utilized for this study contained five sections that were designed to describe (a) demographic characteristics, (b) ATV usage behaviors, (c) ATV-related injury prevalence, (d) previous attendance of ATV-related

safety trainings, and (e) knowledge about ATV safety. Item response format varied, using multiple choice, fill-in-the-blank, and Likert-type items based on a scale where 1 = "I did not ride an ATV during the past 3 months," 2 = "Never [performed behavior] (0 out of 10 rides)," 3 = Rarely [performed behavior] (1-2 out of 10 rides)," 4 = "Sometimes [performed behavior] (3-6 out of 10 rides)," 5 = "Most of the time [performed behavior] (7-9 out of 10 rides)," and 6 = "Always [performed behavior] (10 out of 10 rides)."

Face and content validity of the modified instrument were established through review by an expert panel (Litwin, 2003), consisting of five university faculty members, two certified ASI ATV safety instructors, an epidemiologist from Injury Prevention Service of the Oklahoma State Department of Health, and the Oklahoma 4-H ATV Safety program state coordinator. Owing to Novak et al.'s (2013) study being conducted in Illinois, several of the ATV behavior questions were modified to reflect machines that are more commonly used in Oklahoma, (i.e. "snowmobiles" were replaced with "side by sides," also known as "utility task vehicles" or UTVs).

Litwin (2003) recommended incorporating the use of graphics to vary survey response sets. Visual images were added of each motorized vehicle (ATVs, side by sides, and minibikes/trailbikes/dirt-bikes) to not only vary response sets, but to also increase visual readability for the youth populations under study. Radhakrishna (2007) advised conducting a readability test to enhance questionnaire validity. After revising several questions for clarity, the final version of the questionnaire had a Flesch-Kincaide grade level score of 6.2. Several questions were added to the sections on ATV usage behaviors and ATV safety knowledge to reflect the five key behaviors examined for this study

(helmet use, safety equipment/riding gear use, riding and/or operating with passengers, riding on public roads and/or highways, and riding inappropriately sized machines).

Prior to conducting data collection at the Wildlife Expo, a pilot test was conducted at a rural Oklahoma elementary school. A school-based ATV safety training was taught on September 18, 2017. Prior to participating in the training, students completed the survey instrument during their homeroom class period. After reviewing the surveys collected during the pilot-test phase, several formatting errors were corrected. Two questions were deemed as non-essential for the purposes of this particular study and were removed. The final survey instrument consisted of 25 questions.

Reliability coefficients were not established for Novak et al.'s (2031) initial instrument. Reliability of the instrument was established for this study using Cronbach's alpha coefficient for reliability estimates. Creswell (2008) advised looking for positive coefficients of at least .60 or above. Cronbach's alpha indicates high reliability for questions designed to measure the construct of ATV-related behaviors ($\alpha = .809$). Reliability of the instrument pertaining specifically to knowledge-related questions was determined post hoc using the Kuder-Richardson 20 (*KR20*) formula, a test for internal consistency used commonly with dichotomous level data (Gregory, 2011). The instrument produced the following reliability coefficients (*KR20*) for the five knowledge-related questions: (a) .368 for the pre-test, and (b) .449 for the post-test. The reader should interpret the results pertaining to ATV-related knowledge with caution; the need for exploration of this finding is acknowledged.

Data Collection

The ATV safety training offered at the Wildlife Expo was an abbreviated version of the ASI *RiderCourse*^{SM} training. The abbreviated version lasted approximately two hours and was offered in four sessions each day throughout both days of the Expo. The first hour of the training consisted of an introduction to the ATV *RiderCourse*^{SM}, where participants were taught safe riding behaviors; range signals and riding rules; and how to operate the machine's controls and start the engine. For the second half of the lesson, participants actively operated the machines and learned to start and stop, drive forward in a straight line, and drive an oblong pattern. The training was conducted by several ASI licensed instructors from across the state, including the state ASI ATV Safety Training Coordinator and the researcher.

The Wildlife Expo was chosen as a unit of analysis for this study owing to the ability to reach a large number of youth from across the state at one time. In the full-scale *RiderCourse*^{SM} training, each instructor can oversee eight students at a time, i.e. two instructors can oversee a class size of 16. Owing to the often detailed logistics associated with offering a full-scale course, one training will reach only a relatively small number of students at a time. In order to reach a larger population, while still offering the riding component of the *RiderCourse* training, it was determined that the Wildlife Expo would serve as an appropriate training opportunity.

Prior to each two-hour training session, participants completed a youth assent form, along with the survey instrument adapted from Novak et al. (2013), titled "Pre-Intervention Off-Road Vehicle Survey," where participants self-reported their behaviors and knowledge related to ATV use. The survey took approximately ten minutes to

complete. Parents were required to complete a parent consent form, allowing their minor child to complete the survey instrument and participate in the training.

Post-test survey data were collected approximately three months after the training took place. As the survey instrument was designed to measure a change in ATV-related behaviors and retention of ATV-related knowledge, the researcher elected to test participants after a three-month interval, as opposed to immediately following completion of the trainings. Post-test data were collected following Dillman et al.'s (2014) mixed-mode questionnaire and survey implementation recommendations. As opposed to using a single-mode survey method, a mixed-mode survey method often has the benefit of lower costs, improved timeliness, reduced coverage error, improved response rates, and reduced nonresponse and measurement errors (Dillman et al., 2014).

Owing to the diversity of the population sampled at the Expo, it was determined that a mixed-mode approach would be beneficial for several reasons, the first being that respondents had the option to provide a mailing and/or e-mail address as their preferred method of contact for the post-test survey distribution. As some participants only indicated one mode of contact, it was necessary to distribute the post-test survey via a Qualtrics web survey, as well as a mailed paper survey, known as a *web-first* or *web+mail* design (Dillman et al., 2014). As per Dillman et al.'s (2014) guidelines, this method has been shown to increase response rates substantially, as opposed to a *mail-first* design.

Utilizing a mixed-mode approach was also beneficial for this study due to reduced survey costs. Dillman et al. (2014) noted that "many mixed-mode survey designs begin with less expensive modes and then move to more costly modes for those who do not

respond initially" (p. 401). Due to low response rates via the initial and subsequent Qualtrics web-link, a mailed copy with a postage paid return envelope was distributed, followed by a mailed copy with a postage paid return envelope and a $2 cash incentive (Table 3.2). When using monetary incentives, Dillman et al. (2014) recommended an amount between $1 and $5, as small cash incentives have been shown to increase survey response rates.

Table 4.1

Timeline for Distribution of Post-Test Survey for Wildlife Expo Population

Week	Procedure
Week One	Online Qualtrics survey
Week Three	Online Qualtrics survey
Week Four	Mailed survey
Week Twelve	Mailed survey with $2 cash incentive

In accordance with several of the guidelines proposed by Dillman et al. (2014), the same question format and wording, as well as visual format, were used across both the web-based and paper-based surveys. For the web-based survey, steps were taken to ensure that respondents were not forced to answer any question they did not wish to respond to and respondents had the option to stop the survey and complete it at a later time. For both the web- and paper-based surveys, all correspondence was personalized to each respondent.

A primary limitation of this study pertains to the single population utilized and the limited size of said population. The results obtained have limited generalizability beyond the scope of this study. Additionally, since reliability coefficients were not established for Novak et al.'s (2013) initial instrument, the need for continued psychometric refinement of the instrument is acknowledged.

Data were input and analyzed using the *Statistical Package for the Social Sciences v. 21.0*. Data associated with all research objectives were analyzed using descriptive statistics, including frequencies and percentages.

Results

Research objective one sought to describe the demographic characteristics of youth participating in an interactive ATV safety training at the 2017 Oklahoma Wildlife Expo, based on their current level of ATV-related experience (Table 4.2). Based on responses to selected behavioral questions, participants were classified as either "experienced" (n = 36, 38.3%), indicating that they had previous experience with operating ATVs, or "non-experienced" (n = 59, 61.7%) indicating they had little or no experience with operating ATVs. Close to two-thirds of the participants were reported as being male for both the experienced and non-experienced groups (63.9% and 66.1%, respectively). The majority of participants were either elementary (grades 3-5) or middle (grades 6-8) school students and ages of the participants ranged from 10 to 17 years old, with the average age being 11.67. Participants primarily reported living in town (38.9% experienced, 42.4% non-experienced) or in a city (38.9% experienced, 54.2% non-experienced).

Table 4.2

Demographic Characteristics of Students Participating in an Interactive ATV Safety Training (N = 95)

	Experienced		Non-Experienced	
	f	%	*f*	%
Gender				
Male	23	63.9	39	66.1
Female	13	36.1	20	33.9
Missing	0	0.0	1	1.7
Total	36	100.0	59	100.0
Age				
10-13	32	88.9	50	84.7
14-17	4	11.1	8	13.6
Missing	0	0.0	1	1.7
Total	36	100.0	59	100.0
Grade				
3-5	15	41.7	19	32.2
6-8	19	52.8	33	55.9
9-12	2	5.6	6	10.2
Missing	0	0.0	1	1.7
Total	36	100.0	59	100.0
Domicile				
Farm	8	22.2	1	1.7
Town	14	38.9	25	42.4
City	14	38.9	32	54.2
Missing	0	0.0	1	1.7
Total	36	100.0	59	100.0

Note. f indicates frequency.

Table 4.3 describes the prevalence of family ownership of ATVs (both youth and adult models), side by sides, and minibikes, trailbikes, and dirt-bikes. Additionally, questions were asked related to the prevalence of operating (as the driver) and riding (as a passenger) ATVs, side by sides, and minibikes, trailbikes, and dirt-bikes. The highest percentage reported for family ownership of the aforementioned motorized vehicles was for adult-model ATVs (16.8%), followed by minibikes, trailbikes, and dirt-bikes (15.8%),

side-by-sides (10.5%), and youth-model ATVs (8.4%). Similar to family ownership, the highest percentage reported was for operating adult-sized ATVs (40.0%). Pertaining to riding as a passenger, the highest percentage reported was for youth who rode on side-by-sides (49.5%), followed by adult-model ATVs (38.9%).

Table 4.3

Prevalence of Motorized Vehicle Ownership, Operation as the Driver, and Riding as a Passenger for Participants in an Interactive ATV Safety Training (N = 95)

	Youth-Model ATV		Adult-Model ATV		Side-by-Side		Minibike, Trailbike, or Dirt-bike	
	f	%	*f*	%	*f*	%	*f*	%
Family Ownership								
Own	8	8.4	16	16.8	10	10.5	15	15.8
Do not own	87	91.6	79	83.2	85	89.5	80	84.2
Operated (as the driver)								
Yes	24	25.3	38	40.0	25	26.3	26	27.4
No	71	74.7	57	60.0	70	73.7	69	72.6
Ridden (as passenger)								
Yes	15	15.8	37	38.9	47	49.5	14	14.7
No	80	84.2	58	61.1	48	50.5	81	85.3

Research objective two sought to describe the prevalence of ATV usage, ATV-related injuries, and previous participation in an ATV-related safety training (Table 4.4). While over half of participants reported that they had not ridden an ATV within the past three months, of those who had ridden ATVs, the highest percentage reported was for riding 1-10 times within the past three months (29.5%). Participants most commonly reported using ATVs for fun (67.4%). When asked if participants own helmets to ride ATVs, 21.1% reported owning a helmet, 6.3% of whom reported that they both own and borrow helmets, while 2.1% reported owning but not borrowing helmets. The highest

percentage reported for helmet ownership/use was for participants who do not own a helmet, but borrow one (40.0%).

Table 4.4

Reported Pre-Test ATV Usage, ATV Safety Training Prevalence, and Injury Prevalence for Youth Participating in an Interactive ATV Safety Training (N = 95)

	Frequency	Percentage
Operating and/or riding an ATV (in the past 3 months)		
0 times	52	54.7
1-10 times	28	29.5
11-20 times	8	8.4
21-39 times	3	3.2
40 or more times	2	2.1
Missing	2	2.1
ATV Use		
For fun (Yes)	64	67.4
For work on the farm/ranch (Yes)	6	6.3
Both (Yes)	14	14.7
Other (Yes)	9	9.5
Missing	7	7.4
Owning and/or borrowing a helmet (in the past 3 months)		
Yes	20	21.1
Yes, and borrow a helmet	6	6.3
Yes, and do not borrow a helmet	2	2.1
No	7	7.4
No, and borrow a helmet	38	40.0
No, and do not borrow a helmet	19	20.0
Missing	3	3.2
ATV training		
Have previously attended an ATV training	13	13.7
Have not previously attended an ATV training	77	81.1
Missing	5	5.3
Injured while operating and/or riding an ATV		
No	86	90.5
Yes	6	6.3
Missing	3	3.2
Number of times injured		
1	3	3.2
2	2	2.1

When asked about the prevalence of injuries sustained due to ATV-related accidents and/or crashes, 6.3% of participants reported having been injured (Table 4.4). Of those participants who reported being injured, 3.2% reported having been involved in at least one accident and 2.1% were injured twice. The majority of participants (81.1%) had not previously attended any type of ATV safety training.

Research objective three sought to describe participants' level of ATV-related knowledge related to helmet use, carrying passengers, riding on public roads and/or highways, safety gear/riding equipment use, and riding appropriately sized machines (Table 4.5). The majority of both experienced (55.6%) and non-experienced riders (47.5%) correctly identified a Department of Transportation (DOT) compliant helmet as the most appropriate type of headgear to wear when operating an ATV. For the non-experienced riders, a relatively large proportion of participants also identified that they were unsure ("I don't know," 30.5%) as to what type of helmet is appropriate to wear. When asked about how many passengers it is appropriate to carry on an ATV, 50% of the experienced riders correctly indicated that only one person should operate an ATV and that no passengers should be carried; however, 38.9% of experienced riders also incorrectly believed that it is ok to carry at least one passenger. The reverse appeared true for non-experienced riders, who were more likely to indicate that carrying at least one passenger is ok (50.8%), as opposed to those who indicated that no passengers should be carried (33.9%).

Table 4.5

Reported Pre-Test ATV Safety Knowledge of Youth Participating in an Interactive ATV Safety Training (n = 95)

	Experienced		Non-Exp.	
	f	%	*f*	%
Appropriate Type of Helmet to Wear				
A bicycle helmet	4	11.1	6	10.2
A sports helmet (football, baseball, etc.)	-	-	1	1.7
Anything that covers my head is OK	5	13.9	1	1.7
DOT compliant helmet	20	55.6	28	47.5
I don't know	5	13.9	18	30.5
Missing	2	5.6	5	8.5
Appropriate Number of Passengers				
Me + 1 passenger	14	38.9	30	50.8
Me + 2 passengers	-	-	1	1.7
Me + as many as the ATV will hold is OK	1	2.8	3	5.1
Me only	18	50.0	20	33.9
Missing	2	5.6	5	8.5
Inappropriate Riding Location				
ATV trails	1	2.8	3	5.1
Public roads or highways	30	83.3	49	83.1
Off-road locations	3	8.3	1	1.7
Private property where I have permission to ride	-	-	1	1.7
Missing	2	5.6	5	8.5
Single most important piece of protective gear				
Long-sleeved shirt and long pants	2	5.6	2	3.4
Helmet	31	85.0	51	86.4
Gloves	-	-	-	-
Goggles	-	-	1	1.7
Close-toed shoes	1	2.8	-	-
Missing	2	5.6	5	8.5
Inappropriate Method for Determining Rider-Fit				
3 inches of space between pants' seat and ATV	6	16.7	7	11.9
Look at the minimum age label on the ATV	6	17.7	11	18.6
Grip handlebars and move left/right	7	19.4	15	25.4
Size doesn't matter, if I can operate ATV	14	38.9	19	32.2
Missing	3	8.3	7	11.9

Note. Correct answers bolded.

The majority of both experienced (83.3%) and non-experienced riders (83.1%) correctly identified public roads and/or highways as being an inappropriate location for operating ATVs. The majority of both groups also correctly understood that a helmet is

the most important piece of protective equipment to wear when operating an ATV (85.0% experienced, 86.4% non-experienced). While responses pertaining to appropriate ATV-fit guidelines were more varied, a relatively large percentage of both experienced (38.9%) and non-experienced riders (32.2%) were correctly able to determine that the answer "size doesn't matter, as long as I can operate the ATV" is not an appropriate way to determine if an ATV is the correct size for a rider. An independent samples t-test indicated that no statistically significant differences were found between experienced and non-experienced riders related to ATV knowledge $t(93) = 1.127$, $p > .05$.

Research objective four sought to describe participants' ATV usage behaviors, specifically pertaining to the prevalence of helmet use, safety equipment/riding gear use, riding and/or operating ATVs with passengers, riding on public roads and/or highways, and riding inappropriately sized machines. Of the students who reported riding ATVs within the past three months ("experienced" riders), relatively good compliance with the best safety practices as suggested by ASI was demonstrated (Table 4.6). Pertaining to helmet usage, 40.9% reported "always" wearing a helmet (10 out of 10 rides), and an additional 15.9% reported wearing a helmet "most of the time" (7-9 out of 10 rides).

Table 4.6

Reported Pre-Test ATV-Related Behaviors for Experienced Riders Participating in an Interactive ATV Safety Training

	Frequency	Percentage
When you drove or rode an ATV during the past 3 months, how often did you wear a helmet?		
Never or rarely wore a helmet	15	34.1
Sometimes, Most of the time, or Always wore a helmet	29	65.9
Total	44	100.0
When you drove or rode an ATV during the past 3 months, how often has a passenger ridden with you?		
Always, Most of the Time, or Sometimes carried a passenger	15	37.5
Rarely or Never carried a passenger	25	62.5
Total	40	100.0
During the past 3 months, have you ridden an ATV on a public road or highway?		
Always, Most of the Time, or Sometimes rode on a public road or highway	4	10.0
Rarely or Never rode on a public road or highway	36	90.0
Total	40	100.0
When you rode an ATV during the past 3 months, how often did you wear safety gear (long-sleeved shirt, long pants, close-toed shoes, gloves, and/or goggles)?		
Never or Rarely wore safety gear	19	45.2
Sometimes, Most of the Time, or Always wore safety gear	23	54.8
Total	42	100.0
During the past 3 months, how often have you ridden an adult-sized ATV?		
Always, Most of the Time, or Sometimes rode an adult-sized ATV	22	59.4
Rarely or Never rode an adult-sized ATV	**15**	**40.5**
Total	37	100.0

Note. Bolded items indicate most desirable practice

When asked about carrying passengers, 45.0% reported “never” carrying a passenger (0 out of 10 rides). A high percentage of participants also reported “never”

riding an ATV on public roads and/or highways (77.5%). In terms of safety gear usage, participants were more likely to either "always" wear safety gear (31.0%) or "never" wear safety gear (26.2%). The highest percentages reported for operating an adult-sized ATV were for those participants who "always" or "most of the time" performed the behavior (27.0 for each).

Research objective five sought to compare participants' pre- and post-test scores pertaining to ATV-related knowledge and behaviors, prior to and after participation in the interactive ATV safety training. While post-test data collection yielded a low response rate (n = 19), pre- and post-test results for these participants were compared for the benefit of better understanding the impact of participation in the training.

A McNemar test was conducted to compare pre- and post-test ATV-related knowledge responses (Table 4.7). Test results indicate that the two proportions were different for knowledge question #2, pertaining to carrying passengers, p = .039 (2-sided). While not statistically significant, descriptive statistics do indicate that knowledge related to wearing a helmet, riding on public roads and/or highways, wearing safety gear, and riding adult-sized ATVs increased after participation in the ATV safety training. It is also worth noting that 100% of participants, who completed both the pre- and post-test surveys (n = 19), correctly answered the questions related to riding on public roads and/or highways and wearing safety gear for the post-test, indicating an increase in the percentage of correct responses from the pre-test.

Table 4.7

McNemar Test Comparing Pre- and Post-Test ATV-Related Knowledge Responses

ATV-Related Knowledge	*n*	*M*	*SD*	*p*
Knowledge Question #1: Wearing a Helmet				
Pre-Test	19	0.58	.507	.508
Post-Test	19	0.74	.452	
Knowledge Question #2: Carrying Passengers				
Pre-Test	19	0.47	.513	.039*
Post-Test	19	0.84	3.75	
Knowledge Question #3: Riding on Public Roads and/or Highways				
Pre-Test	19	0.79	.419	.125
Post-Test	19	1.00	.000	
Knowledge Question #4: Wearing Safety Gear				
Pre-Test	19	0.95	.229	1.000
Post-Test	19	1.00	.000	
Knowledge Question #5: Riding an Adult-Sized ATV				
Pre-Test	19	0.53	.513	.754
Post-Test	19	0.63	.496	

Note. * indicates statistical significance at the .05 alpha level.

A paired-samples t-test was conducted to compare the summated pre- and post-test knowledge scores, i.e. the total number of correct responses (Table 4.8). A statistically significant difference was found for participants' summated ATV knowledge score $t(18) = -2.766$, $p < .05$, indicating that their overall knowledge related to ATV use increased significantly.

Table 4.8

Paired Samples t-test Comparing Pre- and Post-Test ATV-Related Knowledge Responses (n = 19)

ATV-Related Knowledge	*n*	*M*	*SD*	*t*	*SE*	*df*	*p*
Summated Knowledge Score							
Pre-Test	19	3.32	1.416	-2.766	.323	18	.013*
Post-Test	19	4.21	1.787				

Note. * indicates statistical significance at the .05 alpha level.

Paired-samples t-tests were conducted to compare pre- and post-test behavior responses for those participants who had ATV riding behaviors to report (Table 4.9). No statistically significant differences were found for any of the five ATV-related behavior responses. While not statistically significant, mean results indicate a decrease in scores for each of the five behaviors, which is likely attributable to the fact that the majority of these participants indicated that they had not recently ridden an ATV during the time of post-test data collection.

Table 4.9

Paired Samples t-test Comparing Pre- and Post-Test ATV-Related Behavior Responses

ATV-Related Behaviors	*n*	*M*	*SD*	*t*	*SE*	*df*	*p*
Behavior #1: Wearing a Helmet							
Pre-Test	8	3.50	1.927	2.143	.875	7	.069
Post-Test	8	1.63	2.120				
Behavior #2: Carrying a Passenger							
Pre-Test	8	1.75	1.581	1.986	.441	7	.087
Post-Test	8	.88	1.126				
Behavior #3: Riding on Public Roads and/or Highways							
Pre-Test	8	1.00	.756	1.000	.375	7	.351
Post-Test	8	.63	.744				
Behavior #4: Wearing Safety Gear							
Pre-Test	6	3.33	2.066	1.437	1.276	5	.210
Post-Test	6	1.50	2.345				
Behavior #5: Riding an Adult-Sized ATV							
Pre-Test	7	3.43	1.813	2.085	.685	6	.082
Post-Test	7	2.00	2.236				

Note. Response values ranged from 1 (poor behavior) to 5 (perfect behavior); a higher mean score indicates better behavior. A response value of 0 indicated that the participant had not ridden an ATV during the past three months.

Conclusions

The results of this study are in accordance with several related previous findings (Brown et al., 2002; Campbell et al., 2010; Goldcamp et al., 2006; Novak et al., 2013; Tormoehlen & Sheldon, 1996), indicating that the ATV safety training was effective at increasing ATV safety knowledge, but was largely ineffective at changing ATV-related behaviors. Youth participating in this study were predominantly male, with the majority of participants being either elementary or middle school-aged students who live in a town or city. Of the four types of recreational motorized vehicles, including youth-model ATVs, adult-model ATVs, sides-by-sides, and minibikes, trailbikes, and dirt-bikes, adult-model ATVs were most commonly reported as being both owned and operated by youth and their families. The machine most commonly reported as being ridden on as a passenger were side-by-sides, followed closely by adult-model ATVs. As side-by-side machines are designed to carry passengers, this statistic appears logical; however, the fact that a large percentage of youth also reported being a passenger on adult-sized ATVs, as well as being an operator of said machines, is cause for concern.

The typical participant rode infrequently and used ATVs primarily for recreation. Two-thirds of participants had little to no experience with operating ATVs. These behaviors could be representative of the majority of participants living in primarily suburban/urban areas, where youth may have more limited access to ATVs. For some participants, the training provided their first opportunity for ATV use. A relatively small percentage of participants reported owning a helmet, yet of those participants who did not own a helmet, it is encouraging that nearly half reported borrowing a helmet when operating and/or riding on ATVs. Very few participants reported being injured in an

ATV-related crash or accident. The vast majority of students reported not having ever attended an ATV safety training, prior to the training offered as part of this study.

Participants demonstrated mixed results pertaining to their level of ATV-related safety knowledge. Nearly half of all participants (both experienced and non-experienced) correctly identified a Department of Transportation (DOT) compliant helmet as the most appropriate type of headgear to wear when operating an ATV. While a third of non-experienced riders indicated not knowing what type of headgear was most appropriate to wear, it is encouraging that nearly half of these same participants, who had little to no prior involvement with operating an ATV, understood what type of headgear is appropriate to wear.

Youth in this study wrongly believe that it is okay to carry passengers. While half of the experienced riders correctly indicated that only one person should operate an ATV at a time, a third of this group also incorrectly indicated that it is okay to carry at least one passenger. For non-experienced riders, the reverse was true, indicating that over half of the non-experienced riders incorrectly believed it is okay to carry at least one passenger.

The overwhelming majority of both experienced and non-experienced riders correctly answered the questions related to inappropriate locations to operate ATVs and wearing safety gear, indicating that youth understand that public roads and/or highways are not an appropriate place to ride ATVs and that wearing a helmet is the most important piece of ATV safety gear. While responses varied for the question related to ATV rider-fit guidelines, the highest percentages reported for both experienced and non-experienced riders were for the correct response, “size doesn’t matter, as long as I can operate the

ATV," indicating that youth generally understood this is not the most appropriate way to determine if an ATV the correct size for a rider.

In terms of overall knowledge, there was no significant difference between experienced and non-experienced riders, indicating that having previous ATV-related experience had little bearing on how well participants comprehended common ATV safety practices. However, when comparing participants' pre- and post-test ATV-related knowledge responses, a significant increase in overall knowledge was observed, indicating that the ATV safety training was effective at increasing ATV safety knowledge. This finding, however, cannot be generalized beyond the very small population who completed both the pre- and post-test survey instruments, and should be interpreted with caution.

While these results are laudable, it is important to acknowledge that participants' knowledge and behaviors indicate that there is still much room for improvement related to safe and effective ATV riding practices. Youth classified as experienced riders achieved a slightly higher overall percentage of correct responses for each of the five risk factor areas, as compared to the non-experienced riders, yet if a letter grade were to be assigned to these percentages, the results for both groups would indicate mixed effectiveness (Figure 4.3).

ATV Safety Report Card – *Knowledge*		
RISK FACTOR AREA	**EXPERIENCED RIDERS**	**NON-EXPERIENCED RIDERS**
Wearing a helmet	F	F
Carrying passengers	F	F
Riding on public roads and/or highways	B-	B-
Wearing safety gear	B+	B+
Riding adult-sized machines	F	F

Figure 4.3. Letter grades assigned for experienced and non-experienced riders' ATV knowledge responses.

Pertaining to the five key areas of ATV usage behaviors examined for this study, and when analyzed in terms of either "never" exhibiting a behavior versus "rarely," "sometimes," "most of the time," or "always," exhibiting a behavior, the results were again mixed. Students who were categorized as "experienced" riders were more likely to "always," "most of the time," or "sometimes" wear a helmet, "rarely" or "never" carry passengers, and "rarely" or "never" ride on public roads and/or highways. Safety gear usage was less common for experienced riders, yet a third of participants still reported "always" wearing safety gear; however, nearly a quarter of participants also reported "never" wearing safety gear. While participants exhibited relatively good compliance with four of the five ATV usage behaviors examined, a high percentage of experienced participants reported "always," "most of the time," or "sometimes" riding an adult-sized ATV.

Similar to the results obtained for participants' ATV-related knowledge, their reported behaviors also indicate that there is still much room for improvement as demonstrated through their "report card" (Figure 4.4). While it is encouraging that youth reported that they generally do not operate ATVs on roads or highways, which is consequently how many youth are being injured and/or killed when operating ATVs (NewsOK, 2017; Simon & Meyers, 2017), these same youth are also not wearing helmets or safety gear, are carrying passengers, and are riding and/or operating adult-sized ATVs, which is serious cause for concern.

ATV Safety Report Card – *Behavior*	
RISK FACTOR AREA	**EXPERIENCED RIDERS**
Wearing a helmet	D+
Carrying passengers	D+
Riding on public roads and/or highways	A-
Wearing safety gear	F
Riding adult-sized machines	D-

Figure 4.4 Letter grades assigned for experienced riders' ATV behavior responses.

Discussion

Overall, several of the findings of this study are considered positive, yet results also indicate there is still much room for improvement related to safe and effective ATV riding practices. Youth appeared to exhibit congruency between their knowledge and behaviors related to wearing a helmet and not operating ATVs on public roads and/or highways. While a relatively small number of youth reported actually owning a helmet, many reported borrowing a helmet, which is encouraging. A high percentage of youth

also reported never operating an ATV on a public road and/or highway, and answered the matching knowledge question in a similarly positive fashion.

Conversely, pre-test results indicate that participants did not exhibit congruency between their behaviors and knowledge related to the prevalence of carrying passengers. While experienced riders were more likely to correctly indicate that only one person should be on an ATV at a time, as compared to non-experienced riders, a substantial number of experienced riders also indicated that it is okay to carry at least one passenger. This indicates that many youth wrongly believe it is an acceptable and commonplace practice to carry passengers. Post-test results reveal that participation in the training significantly altered participants' knowledge related to this behavior, indicating that youth effectively came to understand that carrying passengers while operating an ATV is an extremely dangerous behavior to engage in.

The majority of youth appeared very knowledgeable when asked about proper safety gear and a sizable number of participants were likely to always wear safety gear. However, an equally sizable number of participants also indicated not wearing safety gear. Youth were also more likely to ride adult-sized ATVs and responses were somewhat mixed related to participants' knowledge of this subject.

It could be inferred that while non-experienced riders lacked the actual experience to distinguish negatively associated riding behaviors, experienced riders, on the other hand, were perhaps prone to previous "miseducative" (Dewey, 1938) experiences. In terms of Kolb's (2015) experiential learning theory, whereby learners must grapple with the opposing dual dialectics of action/reflection and experience/abstraction in order for the process of learning to be achieved, riders' perceptions of appropriate riding behaviors

were challenged through participation in the ATV safety training. By providing the opportunity for participants to actively reflect on their riding experiences, and conceptualize how the riding experience at the Expo perhaps differed from their previous experiences and already established norms, participants were able to actively experiment with practicing appropriate riding behaviors.

Youth who had already had experience with ATVs prior to participation in the training were able to add another iteration of ATV-related experience to their learning spiral (Kolb, 2015), thereby creating a richer and more broad base of experience from which to reflect upon. For many of these youth, it could be inferred that improper riding practices were already established prior to the training, either because they lacked appropriate instruction or were provided with inaccurate guidance. Those youth who had little or no prior experience related to ATV use had the opportunity to begin the first iteration of their ATV-related experiential learning cycle, thereby creating an opportunity to learn safe and effective riding practices from the onset.

This group of participants is unique in the sense that youth were from predominantly suburban/urban areas and generally had little to no experience with operating ATVs. Participants voluntarily elected to participate in the training, indicating that they "self-initiated" (Rogers, 1969) the learning process and were genuinely interested in the subject matter. Owing to these characteristics, the training at the Wildlife Expo provided an opportunity to teach several first-time riders, thereby establishing safe riding practices from the onset and potentially correcting any preconceived misconceptions regarding ATV usage.

When examining the training in terms of Kolb's (2015) experiential learning cycle, the training began with instruction delivered via an abstract conceptualization approach, i.e. teacher-centered, direct instruction. This was followed by a concrete experience, i.e. the riding component of the training. As participants began riding the ATVs, opportunities for active experimentation were rife; continual feedback, support, and encouragement were provided, with actions modified and/or corrected as needed. While a brief summary was provided at the end of the training, reiterating the importance of the five risk factor areas, a purposeful opportunity for reflective observation was probably the most lacking component of the experiential learning cycle. As exhibited by the results of this study, the lack of congruency between participants' knowledge and behaviors may be indicative of a need for more purposeful and direct opportunities for reflection (Joplin, 1981).

Baker, Brown, Blackburn, and Robinson (2014) found that the type of reflection provided for students, particularly reflection-in-action, had a significant effect on students' knowledge acquisition scores. In order for youths' behaviors to change, more emphasis may need to be concentrated on implementing correct knowledge. Perhaps more opportunities for reflection *during* the experience itself (reflection-in-action), coupled with purposeful reflection *after* the experience (reflection-on-action), could lead to more significant mastery of content (Baker & Robinson, 2018).

Implications/Recommendations for Future Research

Results from this study indicate that helmet and safety gear usage is lacking, and that many youth operate, or are passengers, on adult-sized ATVs. It should be noted, however, that some of the behaviors exhibited by youth may be somewhat attributable to

factors beyond the youth's control. Pertaining to helmet usage, literature has indicated that the reason why youth don't wear helmets is simply because they don't have helmets (National 4-H Council, 2003). In an effort to increase bicycle helmet usage, Morris and Trimble (1991) found that while education and awareness-raising alone did not affect any change in helmet use, offering a subsidized incentive for helmet purchases did elicit effective change. Similar results were obtained by DiGuiseppi, Rivara, Koepsell, and Polissar (1989), who found that reducing financial barriers to helmet purchases resulted in a significant increase in helmet use. Research related to reducing financial barriers to purchasing helmets for ATV use should continue to be explored.

One factor that may contribute to continued use of inappropriately sized machines is the cost of ATV machines. Aitken et al. (2004) found that both youth and adult populations believed that enforcing size restrictions on ATVs would be ineffective due to the relatively high cost of the vehicles, especially when larger ATVs are needed for farm-related work. Cost can also be a prohibitive factor if purchasing multiple smaller ATVs for children (Aitken et al., 2004). Further inquiry into the factors that determine ATV purchasing decisions should be examined.

As suggested by Novak et al. (2003), additional research should be conducted related to the employment of broader, community-based trainings that involve not only youth, but also parents and community leaders. When examining a promotional campaign to encourage bicycle helmet use by children, adoption was substantially increased when parents were actively involved in the campaign and were influenced to also wear helmets (DiGuiseppi, Rivara, Koepsell, & Polissar, 1989). An evaluation of the 4-H Community ATV Safety Program (National 4-H Council, 2003) found that both parents and youth

recognize the need for adult supervision when operating ATVs and recommend that "there needs to be a change in attitude from complacency to awareness on the part of both parents and youth" (p. 15).

Similar to Aitken et al. (2004), who utilized focus groups to examine recommendations for increasing public awareness related to ATV usage, the researcher recommends utilizing a similar methodology to explore the underlying factors that contribute to unsafe ATV-related behaviors. A mixed-methods approach is suggested to generate a more comprehensive picture of the phenomenon of ATV usage among youth in Oklahoma.

Additional recommendations are to expand the scope of this study to include a substantially larger population of youth across the state of Oklahoma and also to explore additional types of experiential training opportunities, such as through the full-scale ASI ATV *RiderCourse*^{SM} training and the ASI online *e-course*. For future research, in order to increase post-test response rates, the researcher recommends utilizing a retrospective pre-post analysis in order to measure participant responses both prior to and after the training, at one point in time, as opposed to two points in time. Similar to Baker and Robinson (2018), who utilized a six-week deferred post-test to compare direct and experiential learning approaches, the researcher also recommends additional longitudinal post-test data collection.

The need for continued refinement of the study's survey instrument is acknowledged. The low Kuder-Richardson (*KR-20*) coefficients generated for questions related to ATV-knowledge indicates that this portion of the instrument needs to be reevaluated, or that other ATV-related knowledge instruments should be explored. A

more extensive ATV knowledge test may be called for in order to truly measure mastery of content. The reader should interpret the results with caution owing to the limited generalizability of the population examined for this study.

The continued prevalence of injuries and fatalities related to ATV use among youth has been identified as an ongoing concern. It is imperative that continued efforts be made to provide effective educational programming to youth, as well as adults, regarding ATV safety. Research efforts should continue to be explored in the hopes of reducing the number of ATV-related injuries and fatalities.

CHAPTER V

STUDY II

AN EXAMINATION OF ATV USAGE BEHAVIORS AND KNOWLEDGE OF YOUTH PARTICIPATING IN A SCHOOL-BASED ATV SAFETY TRAINING

Introduction

Each year in the United States, hundreds of fatalities and thousands of accidents are reported related to all-terrain vehicle (ATV) usage. Youth are considered an especially at-risk population, predominantly children 16 years of age or younger. Reasons attributed to youth fatalities and/or accidents related to ATV-usage include a lack of helmet use, riding with passengers, riding without adult supervision, riding after dark, and riding ATVs too large or powerful for the child's age and size (Campbell, Kelliher, Borrup, Corsi, Saleheen, Bourque, & Lapidus, 2010; Brown, Koepplinger, Mehlman, Gittelman, & Garcia, 2002; Tormoehlen & Sheldon, 1996; Hargarten, 1991).

According to the 2016 Annual Report of ATV-Related Deaths and Injuries, published by the U.S. Consumer Product Safety Commission (CPSC) (2017), 14,653 ATV-related fatalities, occurring between 1982 and 2016, were reported in the U.S. In 2015 alone, 340 ATV-related fatalities were reported to CPSC. In the reporting period between 1982 and 2016, 22% of the total number of ATV-related fatalities reported occurred with children younger than 16 years of age (CPSC, 2017). According to Jones

and Bleeker (2005), many of the ATV-related injuries among youth have occurred when "the operator lost control, the vehicle rolled over, the operator or passenger was thrown off, or there was a collision with a fixed object" (p. 70).

In Oklahoma, 142 ATV-related deaths were reported between 1982 and 2007 (25-year period), of which 53 were children under the age of 16 (CPSC, 2013). Within the following three years (2008-2011), 50 additional deaths were reported in Oklahoma (CPSC, 2013). In a study conducted by the Oklahoma State Department of Health during a ten-year period from 1992-2002, 391 people were hospitalized due to injuries sustained from riding an ATV, 38 of whom died due to head injuries (Oklahoma State Department of Health, 2016). In that same time frame (1992-2002), the average number of injuries tripled from 23 injuries per year prior to 1998, to an average of 69 injuries per year thereafter. The highest rates of injury reported were among males ranging from 5 to 24 years of age (Oklahoma State Department of Health, 2016).

A lack of helmet use is commonly associated with ATV-related injuries and fatalities. In an analysis of deaths due to ATV usage, Hargarten (1991) found that head injuries accounted for 63% of the deaths. Bowman, Aitkin, Helmkamp, Maham, and Graham (2009) reported that unhelmeted ATV riders had a 62% increased risk for a traumatic brain injury (TBI), were three times more likely to sustain a TBI, 3.5 times more likely to have neck and face injuries, and more than twice as likely to die in the hospital.

Within the agricultural industry, the prevalence of youth operating ATVs and other farming equipment is common. ATVs utilized on farming and ranching operations are often large in size, capable of carrying heavy loads on the machine itself, as well as

pulling trailers and other agriculturally-related attachments. Youth then have access to these adult-sized machines that are often too large and powerful for youth to operate, resulting in injuries (Goldcamp et al., 2006). According to the 2011 Farm and Ranch Safety Survey, distributed by the National Agricultural Statistics Service (NASS; 2013), an estimated 1,580,000 ATVs were in use on farms and ranches in 2011, of which 88% were used for work. Over 119,000 operations reported having youth younger than 16 years of age who had operated an ATV (NASS, 2011). In a study conducted by Goldcamp et al. (2006), an estimated 2,246 non-fatal ATV-related injuries were reported as having occurred to youths younger than 20 years of age on U.S. farms in 2001. Males accounted for 69% of the injuries reported and 70% of the injuries occurred with youth 10 to 15 years of age. Fifty-eight percent of the ATV injuries reported were a result of recreational activities and many of the injuries involved youth riding without a helmet or operating an ATV too large for such riders (Goldcamp et al., 2006).

Similar to findings of other studies that have examined ATV usage behaviors among youth populations, youths living on farms and in rural areas tend to mirror national trends. In an examination of ATV safety and use patterns of 4-H members in central Illinois, youth reported operating adult-sized ATVs, carrying passengers, and not wearing helmets and/or other appropriate safety equipment (Hafner, Hough, Getz, Whitehurst, & Pearl, 2010). These same youth were found to rarely have participated in any form of ATV safety training and accidents were numerous, indicating a key area for educational intervention (Hafner et al., 2010). In a comparison of ATV-related behaviors, exposures, and injuries between farm youth and nonfarm youth (Jones & Bleeker, 2005), the results of the study suggest that while a higher percentage of farm youth operate

ATVs than their nonfarm counterparts, their use does not result in a statistically significant increase in injuries.

Some of the most disturbing statistics, however, are related to a lack of any formal ATV riding/safety instruction. In a study conducted by Campbell et al. (2010), the researchers found that of 228 survey participants, less than 5% of children who rode ATVs received any type of formal ATV riding/safety instruction. Similar results were reported by Brown et al. (2002), who found that 14% of children (of 109 survey participants) who had been injured in an ATV-related accident had received any formal training prior to operating such a vehicle. Tormoehlen and Sheldon (1996) found that only 1% of youth who rode ATVs (of 2,098 survey participants), were taught by certified, professional ATV instructors.

According to Yuma et al. (2006), injury prevention reactions have not been quick enough to offset accelerated pediatric ATV use and there is concern that prevention efforts may be met with opposition from ATV manufacturers and users. While there have been numerous legislative efforts targeted at pediatric ATV usage in several states, including Utah (Cvijanovich, Cook, Mann, & Dean, 2001), North Carolina (Beidler, Kromhout-Schiro, Douillet, Riesenman, & Rich, 2009), and Florida (Winfield, Mozingo, Armstrong, Hollenbeck, Richards, Martin, Beierle, & Lottenberg, 2010), legislation has not been found to be effective at preventing ATV-related injuries and fatalities (Novak, Hafner, Aldag, & Getz, 2013).

Oklahoma House Bill 1686 (Nations, Sullivan, Roan, Collins, Wesselhoft, McAffrey, Lindley, & Rice, 2007) currently stipulates that it is unlawful for anyone under the age of 18 to operate or be a passenger on an ATV without a helmet. The bill

also states it is unlawful for the operator of an ATV to carry a passenger unless the ATV is specifically designed to carry more than one person (Nations et al., 2007). The fine and court costs associated with violating these laws shall not exceed $25 and may be enforced by any peace officer of the state of Oklahoma (Nations et al., 2007).

Additionally, Senate Bill 1356 (Bass, 2012) stipulates that ATVs are not to be operated on public roads and/or highways with the following exceptions: 1) if the vehicle needs to make a direct crossing of a street or highway, the ATV may cross at approximately a ninety-degree angle, 2) if the vehicle needs to travel on a public road in order to cross a train track, 3) if the operator crossing a street or highway has a valid driver's license, or 4) if the operator makes a crossing during daylight hours. The same bill stipulates numerous guidelines for the operation of golf carts by youth, stating that youth who are at least 12 years of age, but are not yet 16 years of age, shall not operate a golf cart unless they have successfully completed a golf cart safety education course or have passed a proctored equivalency exam, and have received a golf cart education certificate (Bass, 2012). However, no such stipulations appear in the same bill pertaining to ATV usage (Bass, 2012).

Several studies have examined strategies for effectively implementing injury prevention interventions related to ATV usage (Aitkin, Graham, Killingsworth, Mullins, Parnell, & Dick, 2004; Burgus, Madsen, Sanderson, & Rautiainen, 2009; Novak et al., 2013). Using a focus group methodology, Aitken et al. (2004) reported several suggestions for increasing public awareness about the potential dangers of ATVs, including improved access to ATV videos; education from ATV dealers; expanded hunter education and driver's education courses; public media, print media, and

testimonials; and group forums. Other suggestions have included offering initial trainings for beginning operators and more advanced continuing education opportunities for experienced operators, as well as gender-targeted awareness campaigns (Burgus et al., 2009). Novak et al. (2013) suggested that ATV safety educational interventions should be community-based and should not only target youths, but should additionally target parents and community leaders.

Background

The ATV Ride Safe Oklahoma program is a coalition comprised of the Children's Center for Rehabilitation Hospital, Trauma One at University of Oklahoma Medical Center, Oklahoma Cooperative Extension Service 4-H and Youth Development, and Injury Prevention Service through the Oklahoma State Department of Health (ATV Ride Safe Oklahoma, 2017). The purpose of the program is to promote safe and effective ATV riding practices and to reduce the number of ATV-related injuries and fatalities of youth. The program seeks to impact the knowledge, attitudes, and behaviors of ATV users by 1) educating youth and adults through the interactive, five-hour ATV Safety Institute (ASI) ATV *RiderCourse*^{SM} training (ATV Safety Institute, 2016); and 2) educating youth using school-based ATV safety curriculum through schools, clubs, camps, and other youth programs (ATV Ride Safe Oklahoma, 2017). The five risk factor areas targeted by the program include: not wearing a helmet and/or other protective riding gear; carrying passengers on ATVs not specifically designed for more than one person; operating/riding ATVs on pavement and/or public roads and/or highways; and operating/riding an ATV that is not an appropriate size and power for the rider (ATV Ride Safe Oklahoma, 2017).

Theoretical Framework

Since its inception, agricultural education has been rooted in experiential learning (Baker, Robinson, & Kolb, 2012; Knobloch, 2003; Roberts, 2006; Smith & Rayfield, 2017). Experiential learning is considered an important pedagogical approach used within the broad family of secondary agricultural education, as the discipline lends itself so naturally to experiential opportunities (Baker & Robinson, 2016; Baker, Robinson, & Kolb, 2012; Roberts, 2006).

The theoretical framework proposed for this study is Kolb's (1984) experiential learning theory (ELT). Kolb (2015) defined learning as "the process whereby knowledge is created through the transformation of experience" (p. 49). His experiential learning theory is called thus to emphasize "the central role that experience plays in the learning process" (Kolb, Boyatzis, & Mainemelis, 1999, p. 2). The process is described as "a dynamic view of learning based on a learning cycle driven by the resolution of the dual dialectics of action/reflection and experience/abstraction" (Kolb, 2015, p. 50-51).

The intellectual origins of Kolb's (1984, 2015) experiential learning theory can be traced to the seminal works of Kurt Lewin's (1951) social psychology, John Dewey's (1938) philosophical pragmatism, and Jean Piaget's (1970) cognitive-developmental genetic epistemology (Kolb et al., 1999). Kolb's (1984, 2015) model (Figure 4.1) of experiential learning serves as an integration of the aforementioned foundational scholars' models of learning. The outer cyclical portion of the model, comprising the four learning modes of concrete experience, reflective observation, abstract conceptualization, and active experimentation, is attributed to Lewin and Dewey's models. Piaget's influence is seen in the two dialectically opposed dimensions of prehension, or grasping,

and transformation, resulting in four equal adaptive learning modes: prehension via apprehension ("reliance on the tangible, felt qualities of immediate experience" p. 67) or comprehension ("reliance on conceptual interpretation and symbolic representation" p. 67); and transformation via intention ("internal reflection" p. 67) or extension ("active external manipulation of the external world" p. 67). Kolb stated that the premise behind these dimensions is that learning requires "both a grasp or figurative representation of experience and some transformation of that representation" (p. 68). The simple perception of an experience is not enough, something must be done with it for learning to occur.

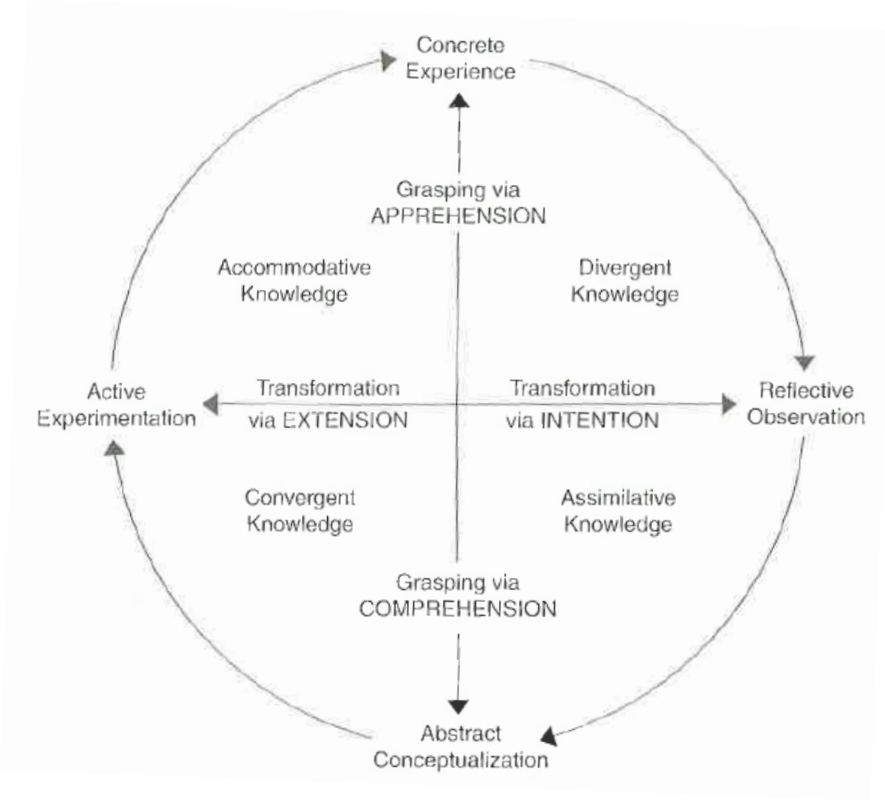

Figure 5.1. Kolb's (1984, 2015) Experiential Learning Cycle. Reprinted from Experiential Learning: Experience as the Source of Learning and Development, 2nd, (p. 68), by David A. Kolb, 2015, Upper Saddle River, NJ: Pearson Education, Inc. Copyright 2015 by Pearson Education Inc. Reprinted with permission.

Kolb's (1984, 2015) theory is built on six assumptions of learning: 1) "learning is best conceived as a process, not in terms of outcomes" (p. 37); 2) all learning is relearning (Kolb & Kolb, 2005, p. 194); 3) "the process of learning requires the resolution of conflicts between dialectically opposed modes of adaptation to the world" (Kolb, 1984, 2015, p. 40); 4) "learning is an holistic process of adaptation to the world" (p. 43); 5) "learning involves transactions between the person and the environment" (p. 45); and 6) "learning is the process of creating knowledge" (p. 48).

Rogers (1969) asserted "there is such a thing as significant, meaningful experiential learning" (p. 4). He further defined the elements of experiential learning, stating that learning has a quality of personal involvement, is self-initiated, is pervasive, is evaluated by the learner, and has meaning (Rogers, 1969). In experiential education, students are treated as "active participants in their own education," and are "encouraged to take the initiative to seek and learn from the expertise of those around them" (Carver, 1996, p. 153). As outlined in the principles of experiential education, defined by the Association for Experiential Education, throughout the learning process, learners should be "actively engaged in posing questions, investigating, experimenting, being curious, solving problems, assuming responsibility, being creative, and constructing meaning" (para. 2).

According to Kolb (2015), successful educators are able to organize their educational activities in such a way that all four learning modes are addressed – experiencing, reflecting, thinking, and acting – and are thereby able to "teach around the learning cycle" (p. 301). Often, this cycle is completed in a recursive fashion, effectively becoming a learning spiral (Figure 2.5) where each new experience created becomes

"richer, broader, and deeper. Further iterations of the cycle continue the exploration and transfer to experiences in other contexts" (Kolb, 2015, p. 301; Kolb & Kolb, 2009). Each trip through the learning cycle reiterates the experiential process, thus leading to learning development (Kolb & Kolb, 2012).

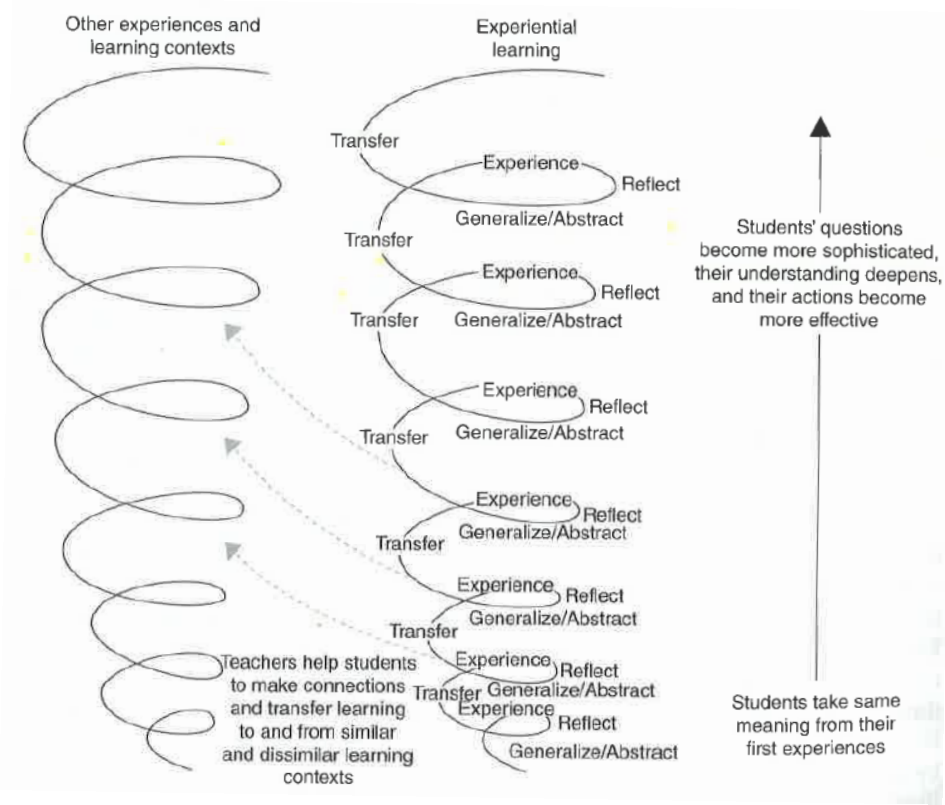

Figure 5.2. The Experiential Learning Teaching and Learning Spiral. Reprinted from Experiential Learning: Experience as the Source of Learning and Development, 2nd, (p. 302), by David A. Kolb, 2015, Upper Saddle River, NJ: Pearson Education, Inc. Copyright 2015 by Pearson Education, Inc. Reprinted with permission.

The justification for using Kolb's experiential learning theory for this study is the emphasis placed on the experiences associated with an ATV safety training. This study consisted of a classroom-based training, which utilized a PowerPoint presentation, videos/film, printed handouts, and static demonstrations. Based on Dale's (1946) Cone of Experience model, these types of experiences fall within the categories of "hearing," i.e.

listening to the presentation, “seeing,” i.e. watching a short film and static demonstrations, and “doing,” i.e. modeling or simulating behaviors (Anderson, n.d.).

Purpose and Objectives

The purpose of this study was to describe ATV usage behaviors and ATV-related knowledge of students prior to and after participation in an educational ATV safety training. The research objectives for this study were answered using a one-group pre-test/post-test design and were guided by the following objectives:

1. Describe the demographic characteristics of students participating in a school-based ATV safety training;
2. Describe prevalence of ATV use, injury prevalence, and prior participation in an ATV-related safety training;
3. Determine if ATV-related knowledge – pertaining to relevance of helmet use, safety equipment/riding gear use, riding and/or operating ATVs with passengers, riding on public roads or highways, and riding inappropriately sized machines - changed after participation in an ATV safety training.
4. Determine if ATV usage behaviors - pertaining to prevalence of helmet use, safety equipment/riding gear use, riding and/or operating ATVs with passengers, riding on public roads or highways, and riding inappropriately sized machines – changed after participation in an ATV safety training;

Methods and Procedures

This study was conducted using a one-group pre-test/post-test survey research design. Coyle Middle/High School, a rural public school system located in northeastern Oklahoma, was approached for participation in a school-based ATV safety training. The

district population consists of 3,940 inhabitants (Oklahoma School Profiles, 2016). According to the most recent U.S. Census Bureau report (2010), the population of Coyle consists of 325 inhabitants. Students are reported as being predominantly Caucasian (70%) or Black (30%). Over half of the school's population (52%) is considered eligible for free/reduced lunch (Oklahoma School Profiles, 2016).

All students in grades 6 – 12 who were in school that day attended the ATV safety training (N = 155) and completed a self-reported pre-test questionnaire. A post-test questionnaire was completed approximately three months after the ATV safety training took place. A total of 148 pre-test questionnaires (95.5% response rate) were returned prior to the beginning of the training. Seven students did not complete the pre-test survey in its entirety, thereby resulting in exclusion from analysis. One hundred twenty-nine post-test questionnaires (83.2% response rate) were returned. A total of 122 questionnaires (both pre- and post-test responses collected) were deemed usable for analysis, yielding a response rate of 79.0%.

Instrument

The questionnaire utilized for this study was adapted, with permission, from a survey instrument created by Novak, Hafner, Aldag, and Getz (2013), who utilized a one-group pre-test/post-test design to examine students who had participated in an ATV safety presentation. The modified questionnaire utilized for this study contained five sections that were designed to describe (a) demographic characteristics, (b) ATV usage behaviors, (c) ATV-related injury prevalence, (d) previous attendance of ATV-related safety trainings, and (e) knowledge about ATV safety. Item response format varied, using multiple choice, fill-in-the-blank, and Likert-type items based on a scale where 1 = "I did

not ride an ATV during the past three months," 2 = "Never [performed behavior] (0 out of 10 rides)," 3 = Rarely [performed behavior] (1-2 out of 10 rides)," 4 = "Sometimes [performed behavior] (3-6 out of 10 rides)," 5 = "Most of the time [performed behavior] (7-9 out of 10 rides)," and 6 = "Always [performed behavior] (10 out of 10 rides)."

Face and content validity of the modified instrument were established through review by an expert panel (Litwin, 2003), consisting of five faculty members (four from Oklahoma State University and one from the University of Arkansas), two certified ASI ATV safety instructors (one from the Oklahoma State University Cooperative Extension Service and one from the Oklahoma State Health Department), an epidemiologist from Injury Prevention Service of the Oklahoma State Department of Health, and the Oklahoma 4-H ATV Safety program state coordinator. Owing to Novak et al.'s (2013) study being conducted in Illinois, several of the ATV behavior questions were modified to reflect machines that are more commonly used in Oklahoma, (i.e. "snowmobiles" were replaced with "side by sides," also known as "utility task vehicles" or UTVs).

Litwin (2003) recommended incorporating the use of graphics to vary survey response sets. Visual images were added of each motorized vehicle (ATVs, side by sides, and minibikes/trailbikes/dirt-bikes) to not only vary response sets, but to also increase visual readability for the youth populations under study. Radhakrishna (2007) advised conducting a readability test to enhance questionnaire validity. The Flesch-Kincaide readability value for the initial instrument was 6.8. Several questions were reworded for clarity; the final version of the questionnaire had a Flesch-Kincaide grade level score of 6.2. Several questions were added to the sections on ATV usage behaviors and ATV safety knowledge to reflect the five key behaviors examined for this study (helmet use,

safety equipment/riding gear use, riding and/or operating with passengers, riding on public roads and/or highways, and riding inappropriately sized machines).

Prior to conducting the pre-test data collection phase, a pilot test of the survey instrument was conducted at a rural Oklahoma elementary school. According to Litwin (2003), pilot-testing serves as an opportunity to pre-test a survey instrument with a small sample population and has the benefit of allowing the researcher to: 1) identify any potential errors in the survey, 2) determine where the instrument may need redesigning, and 3) can predict potential problems that may be encountered when administering the instrument. Pilot-testing allows the researcher to correct any errors before the survey is "mass-produced or used on a wider-scope to gather real data" (Litwin, 2003, p. 58).

A school-based ATV safety training was taught to the pilot-test group on September 18, 2017. Prior to participating in the training, students completed the pre-test survey instrument during their homeroom class period. After reviewing the surveys collected during the pilot-test phase, several formatting errors were corrected. Two questions were deemed as non-essential for the purposes of this particular study and were removed. The final survey instrument consisted of 25 questions.

Reliability coefficients were not established for Novak et al.'s (2013) initial instrument. Reliability of the instrument pertaining to behaviorally-related questions was established post hoc using Cronbach's alpha coefficient for reliability estimates. Creswell (2008) advised looking for positive coefficients of at least .60 or above. Cronbach's alpha indicates high reliability for questions designed to measure the construct of ATV-related behaviors ($\alpha = .809$). Reliability of the instrument pertaining specifically to knowledge-related questions was determined post hoc using the Kuder-Richardson 20 (*KR20*)

formula, a test for internal consistency used commonly with dichotomous level data (Gregory, 2011). The instrument produced the following reliability coefficients (*KR20*) for the five knowledge-related questions: (a) .368 for the pre-test, and (b) .449 for the post-test. The reader should interpret the results pertaining to ATV-related knowledge with caution; the need for exploration of this finding is acknowledged.

Data Collection

The school-based ATV safety training was conducted by the ATV Ride Safe Oklahoma State Training Coordinator, with assistance by the researcher. The training consisted of a Microsoft PowerPoint presentation, highlighting definitions of various types of ATVs and side by side machines; appropriate safety gear; machine fit guidelines and age/size recommendations; and safe riding strategies. The PowerPoint was coupled with examples of appropriate riding gear, static demonstrations using an adult-model ATV, two PSA's related to the "Golden Rules of ATV Safety," (ATV Safety Institute, 2016), and a short film highlighting a local ATV accident survivor. At the conclusion of the training, students received an ASI "Safe Riding Tips" brochure and were encouraged to complete the online ASI ATV safety e-course. As the purpose of this particular study was to specifically examine the changes in behavior and knowledge associated with participation in the school-based ATV safety training, it is not known whether any students completed the online e-course.

The training was conducted on school property, during school hours. Prior to the training, students in grades 6-12 completed the self-reported questionnaire during their homeroom class periods. Post-test data were collected approximately three months after

the ATV safety training was conducted. The post-test survey was distributed on school property, during school hours.

A primary limitation of this study pertains to the single census population utilized and the limited size of said population. The results obtained have limited generalizability beyond the scope of this study. Additionally, since reliability coefficients were not established for Novak et al.'s (2003) initial instrument, the need for continued psychometric refinement of the instrument is acknowledged.

Data were input and analyzed using the *Statistical Package for the Social Sciences v. 21.0*. Data associated with objectives one and two were analyzed using descriptive statistics, including frequencies and percentages. McNemar tests and paired-sample t-tests were employed to analyze the third and fourth objectives of this study.

Results

Research objective one sought to describe the demographic characteristics of students participating in a school-based ATV safety training at Coyle Middle/High School. A total of 155 students completed the ATV safety training and 148 students returned the pre-test questionnaire prior to participation in the training. Table 5.1 describes the demographic characteristics of students who participated in the training. Over half of the students were reported as being male (59.4%), with 40.6% reported as female. Students were almost evenly split among grades and ages of the students ranged from 11 to 18 years old, with the average age being 14.14. The majority of students reported living in either a rural setting (46.5%) or in town (50.3%).

Table 5.1

Demographic Characteristics of Students Participating in a School-Based ATV Safety Training (N = 155)

	Frequency	Percentage
Gender		
Male	92	59.4
Female	63	40.6
Total	155	100.0
Age		
11-14	90	58.0
15-18	65	42.0
Total	155	100.0
Grade		
6-8	80	51.6
9-12	75	48.4
Total	155	100.0
Domicile		
Farm	72	46.5
Town	78	50.3
City	5	3.2
Total	155	100.0

Note. *f* indicates frequency.

Table 5.2 describes the prevalence of family ownership of ATVs (both youth and adult models), side by sides, and minibikes, trailbikes, and dirt-bikes. Additionally, questions were asked related to the prevalence of operating (as the driver) and riding (as a passenger) ATVs, side by sides, and minibikes, trailbikes, and dirt-bikes (Table 5.2). The highest percentage reported for family ownership of the aforementioned motorized vehicles was for adult-model ATVs (35.5%), followed by youth-model ATVs (22.6%), side by sides (18.7%), and minibikes, trailbikes, and dirt-bikes (18.1%). Similar to family ownership, when asked about the prevalence of both operating (as the driver) and riding (as the passenger) the different types of motorized vehicles, the highest percentages reported were again for adult-sized ATVs (54.2% and 62.6%, respectively).

Table 5.2

Prevalence of Motorized Vehicle Ownership, Operation as the Driver, and Riding as a Passenger for Students Participating in a School-Based ATV Safety Training (N = 155)

	Youth-Model ATV		Adult-Model ATV		Side by Side		Minibike, Trailbike, or Dirt-bike	
	f	%	*f*	%	*f*	%	*f*	%
Family Ownership								
Own	35	22.6	55	35.5	29	18.7	28	18.1
Do not own	113	72.9	93	60.0	119	76.8	120	77.4
Missing	7	4.5	7	4.5	7	4.5	7	4.5
Operated (as the driver)								
Yes	67	43.2	84	54.2	61	39.4	42	27.1
No	81	52.3	64	41.3	87	56.1	106	68.4
Missing	7	4.5	7	4.5	7	4.5	7	4.5
Ridden (as passenger)								
Yes	40	25.8	97	62.6	81	52.3	29	18.7
No	108	69.7	51	32.9	67	43.2	119	76.8
Missing	7	4.5	7	4.5	7	4.5	7	4.5

Note. f indicates frequency.

Research objective two sought to describe the prevalence of operating an ATV within the past three months, intended ATV use, owning and/or borrowing a helmet, injury prevalence, and prevalence of prior participation in an ATV-related safety training (Table 5.3). While 40.6% of students reported that they had not ridden an ATV within the past three months, of the students who had ridden ATVs, the highest percentage reported was for riding 1-10 times within the past three months (22.6%). Students most commonly reported using ATVs for fun (47.1%) and 31.6% reported that ATVs were used for both fun and work on the farm or ranch. When asked if students own helmets to ride ATVs, 28.4% of students reported owning a helmet, 1.9% of whom reported that they both own and borrow helmets, while 3.9% reported owning but not borrowing helmets. The highest

percentage reported for helmet ownership/use was for students who neither own nor borrow helmets (41.9%).

Table 5.3

Reported Pre-Test ATV Safety Behaviors and Injuries for Students Participating in an ATV Safety Training (N = 155)

	Frequency	Percentage
Operating and/or riding an ATV (in the past 3 months)		
0 times	63	40.6
1-10 times	35	22.6
11-20 times	20	12.9
21-39 times	8	5.2
40 or more times	19	12.3
Missing	10	6.5
ATV Use		
For fun (Yes)	73	47.1
For work on the farm/ranch (Yes)	14	9.0
Both (Yes)	49	31.6
Other (Yes)	25	16.1
Missing	9	5.8*
Owning and/or borrowing a helmet (in the past 3 months)		
Yes	44	28.4
Yes, and borrow a helmet	3	1.9
Yes, and do not borrow a helmet	6	3.9
No	9	5.8
No, and borrow a helmet	16	10.3
No, and do not borrow a helmet	65	41.9
Missing	12	7.7
ATV training		
Have previously attended an ATV training	16	10.3
Have not previously attended an ATV training	131	84.5
Injured while operating and/or riding an ATV		
No	116	74.8
Yes	29	18.7
Missing	10	6.5
Number of times injured		
1	12	7.7
2 or more	9	5.8

Note. * indicates frequencies do not add up to 100% due to multi-select answers.

When asked about the prevalence of injuries sustained due to ATV-related accidents and/or crashes, 18.6% reported having been injured. Of those students who reported having been injured, 7.7% of students reported being involved in at least one accident, while 5.8% reported being involved in two or more accidents. When asked if students had ever previously attended an ATV safety training, the overwhelming majority of students (84.5%) reported they had not.

Research objective three sought to determine if knowledge related to ATV safety changed after participation in an ATV safety training. Mirroring the ATV-related behaviors section of the survey instrument, questions related to ATV safety knowledge addressed helmet use, carrying passengers, riding on public roads and/or highways, safety gear/riding equipment use, and riding appropriately sized machines (Table 5.4). A large percentage of students correctly identified a Department of Transportation (DOT) compliant helmet as being the most appropriate type of headgear to wear when operating an ATV (43.4%, pre-test) and the number of correct responses increased to 54.9% for post-test results. For the pre-test, over 60% of students incorrectly believed that it is okay to carry at least one passenger; post-test results indicate that the percentage of students who correctly identified that only one person should be operating an ATV increased substantially from 19.7% to 41.8%. While the percentage of correct responses pertaining to riding on public roads and/or highways decreased slightly from pre-test to post-test (86.9% to 75.5%), the majority of students appeared to understand that this is not a safe practice. Similarly, students also appeared to understand the critical importance of wearing a helmet when operating ATVs, despite the decrease in the percentage of correct responses (84.4% to 69.7%). Pre-test responses pertaining to riding appropriately sized

machines were relatively equally disbursed, but the percentage of students who correctly responded to this item increased from 27.8% (pre-test) to 39.3% (post-test).

Table 5.4

Reported ATV Safety Knowledge of Students Participating in an ATV Safety Training (n = 122)

	Pre-Test		Post-Test	
	f	%	*f*	%
Which of the following types of helmets is appropriate to wear when riding an ATV?				
A bicycle helmet	14	11.5	8	6.6
A sports helmet (football, baseball, etc.)	5	4.1	5	4.1
Anything that covers my head is OK	7	5.7	9	7.4
A DOT-compliant helmet	53	43.4	67	54.9
I don't know	39	32.0	27	22.1
Missing	3	2.5	5	4.1
Appropriate number of passengers to carry				
Me + 1 passenger	74	60.7	50	41.0
Me + 2 passengers	7	5.7	4	3.3
Me + as many as the ATV will hold is OK	9	7.4	12	9.8
Me only	24	19.7	51	41.8
Missing	6	4.9	5	4.1
Inappropriate location to operate ATVs				
ATV trails	4	3.3	8	6.6
Public roads or highways	106	86.9	92	75.5
Off-road locations	3	2.5	4	3.3
Private property where I have permission to ride	7	5.7	12	9.8
Missing	2	1.6	6	4.9
Single most important piece of protective gear				
Long-sleeved shirt and long pants	7	5.7	13	10.7
Helmet	103	84.4	85	69.7
Gloves	-	-	2	1.6
Goggles	2	1.6	3	2.5
Close-toed shoes	9	7.4	15	12.3
Missing	1	0.8	4	3.3
Inappropriate method for determining rider-fit				
3 inches of space between pants' seat and ATV	27	22.1	24	19.7
Look at the minimum age label on the ATV	24	19.7	20	16.4
Can grip the handlebars and move left/right	34	27.9	26	21.3
Size doesn't matter, if I can operate ATV	34	27.8	48	39.3
Missing	3	2.5	4	3.3

Note. Correct answers bolded.

McNemar tests were conducted to compare the means of pre- and post-test responses (Table 5.5). Test results indicate that the two proportions were different for knowledge question #1: wearing a helmet $p = .026$ (2 sided); knowledge question #2: carrying passengers $p = .000$ (2 sided); and knowledge question #4: wearing safety gear, $p = .000$. While not statistically significant, mean results do indicate that knowledge related to helmet use, riding on public roads and/or highways, wearing safety equipment, and riding adult-sized ATVs, did increase after participation in the ATV safety training.

Table 5.5

McNemar Test Comparing Pre- and Post-Test ATV-Related Knowledge Responses

ATV-Related Knowledge	*n*	*M*	*SD*	*p*
Knowledge Question #1: Wearing a Helmet				
Pre-Test	119	0.45	.499	.026*
Post-Test	118	0.57	.497	
Knowledge Question #2: Carrying Passengers				
Pre-Test	116	0.21	.407	.000*
Post-Test	118	0.42	.495	
Knowledge Question #3: Riding on Public Roads and/or Highways				
Pre-Test	120	0.84	.367	.164
Post-Test	117	0.77	.423	
Knowledge Question #4: Wearing Safety Gear				
Pre-Test	121	0.86	.349	.000*
Post-Test	119	0.68	.468	
Knowledge Question #5: Riding an Adult-Sized ATV				
Pre-Test	119	0.29	.454	.310
Post-Test	119	0.35	.480	

Note. * indicates statistical significance at the .05 alpha level.

A paired-samples t-test was conducted to compare the summated overall knowledge score (Table 5.6). Results of the analysis were not statistically significant $t(120) = -1.787$, $p > .05$; therefore, the first null hypothesis failed to be rejected.

Table 5.6

Paired Samples t-test Comparing Pre- and Post-Test ATV-Related Knowledge Scores

ATV-Related Knowledge	*n*	*M*	*SD*	*t*	*SE*	*df*	*p*
Summated Knowledge Score							
Pre-Test	121	2.58	1.039	-1.787	.130	120	.076
Post-Test	121	2.81	1.356				

Note. * indicates statistical significance at the .05 alpha level.

Research objective four sought to determine if ATV usage behaviors - specifically pertaining to prevalence of helmet use, safety equipment/riding gear use, riding and/or operating ATVs with passengers, riding on public roads or highways, and riding inappropriately sized machines – changed after participation in the ATV safety training. One-hundred twenty-two participants completed both a pre- and post-test survey instrument. Behavior responses were coded using a summated rating scale (Spector, 1992), where negative behavior responses received a lower scoring and positive behavior responses received a higher scoring. Three questions were reverse-coded to reflect higher scoring for positive responses. Summated scores were calculated for both pre- and post-test responses. The highest behavior score a participant could receive was 30. For reporting purposes pertaining to behavior-related responses, students were categorized as either "experienced" ($n = 86$), indicating that they had previous experience with operating ATVs, or "non-experienced" ($n = 69$), indicating they had very little or no experience with operating ATVs. Since only "experienced" students could report ATV usage behaviors, "non-experienced" responses were excluded from analysis pertaining to research objective four.

Of the students who reported riding ATVs within the past three months, relatively low compliance with the best safety practices as suggested by ASI was demonstrated (Table 5.7). Helmet usage for students who reported "sometimes," "most of the time," or "always" wearing a helmet decreased between pre- and post-tests (40.3% to 32.8%). The highest percentages related to helmet usage were for students who "rarely" or "never" wear helmets (59.7% pre-test, and 67.2% post-test). The percentage of students who "always," "most of the time," or "sometimes" carried a passenger decreased slightly from 44.3% to 43.3%. The highest percentage reported related to operating an ATV on public roads and/or highways for pre-test results was for students who "rarely" or "never" performed the behavior (72.2%); this figure remained stable (71.7%) for the post-test. Pertaining to the use of safety gear, the highest percentages reported for both pre- and post-test results were for students who "never" or "rarely" (58.8% to 62.3%) wore safety gear. The prevalence of riding adult-sized ATVs remained stable between pre- and post-tests for students who reported "always," "most of the time," or "sometimes" performing the behavior (78.2% to 77.0%).

Table 5.7

Pre- and Post-Test Frequency of ATV-Related Behaviors for Experienced Riders

	Pre-Test		Post-Test	
	f	%	*f*	%
When you drove or rode an ATV during the past 3 months, how often did you wear a helmet?[a]				
Never or Rarely wore a helmet	46	59.7	39	67.2
Sometimes, Most of the time, or Always wore a helmet	31	40.3	19	32.8
Total	77	100.0	58	100.0
When you drove or rode an ATV during the past 3 months, how often has a passenger ridden with you?[b]				
Always, Most of the time, or Sometimes carried a passenger	35	44.3	26	43.3
Rarely or Never carried a passenger	44	55.7	34	56.7
Total	79	100.0	60	100.0
During the past 3 months, have you ridden an ATV on a public road or highway?[b]				
Always, Most of the time, or Sometimes rode on a public road or highway	22	27.8	17	28.3
Rarely or Never rode on a public road or highway	57	72.2	43	71.7
Total	79	100.0	60	100.0
When you rode an ATV during the past 3 months, how often did you wear safety gear (long-sleeved shirt, long pants, close-toed shoes, gloves, and/or goggles)?[a]				
Never or Rarely wore safety gear	47	58.8	38	62.3
Sometimes, Most of the time, or Always wore safety gear	33	41.3	23	37.7
Total	80	100.0	61	100.0
During the past 3 months, how often have you ridden an adult-sized ATV?[b]				
Always, Most of the time, or Sometimes rode an adult-sized ATV	61	78.2	47	77.0
Rarely or Never rode an adult-sized ATV	17	21.8	14	23.0
Total	78	100.0	61	100.0

Note. Bolded items indicate most desirable practice.

[a] indicates positively-associated behavior, where 1 = "I did not ride an ATV during the past 3 months," 2 = "Never," 3 = Rarely," 4 = "Sometimes," 5 = "Most of the time," and 6 = "Always."

[b] indicates negatively associated behavior, where 1 = “I did not ride an ATV during the past 3 months,” 2 = “Always,” 3 = “Most of the time,” 4 = “Sometimes,” 5 = “Rarely,” and 6 = “Never.”

Paired-samples t-tests were conducted to compare the means of pre- and post-test responses (Table 5.8). Statistically significant differences were found for four of the five pairs: Behavior #1: Wearing a Helmet $t(64) = 4.020$, $p < .05$, Behavior #2: Carrying a Passenger $t(64) = 2.718$, $p < .05$, Behavior #4: Wearing Safety Gear $t(67) = 3.599$, $p < .05$, and Behavior #5: Riding an Adult-Sized ATV $t(66) = 3.429$, $p < .05$. Results for positively associated behaviors, Behavior #1: Wearing a Helmet, and Behavior #4: Wearing Safety Gear, indicate that behaviors worsened from pre- to post-test. Results for negatively associated behaviors, Behavior #2: Carrying a Passenger and Behavior #5: Riding an Adult-Sized ATV, indicate that behaviors also worsened from pre- to post-test. While not statistically significant, mean results for Behavior #3: Riding on Public Roads and/or Highways, indicate that behaviors also worsened from pre- to post-test.

Table 5.8

Paired Samples t-test Comparing Pre- and Post-Test ATV-Related Behavior Responses for Experienced Riders

ATV-Related Behaviors	*n*	*M*	*SD*	*t*	*SE*	*df*	*P*
Behavior #1: Wearing a Helmet[a]							
Pre-Test	64	3.39	1.610	4.020	.206	63	.000*
Post-Test	64	2.56	1.413				
Behavior #2: Carrying a Passenger[b]							
Pre-Test	64	3.47	1.140	2.718	.178	63	.008*
Post-Test	64	2.98	1.534				
Behavior #3: Riding on Public Roads and/or Highways[b]							
Pre-Test	67	2.82	1.058	.973	.184	66	.334
Post-Test	67	2.64	1.443				
Behavior #4: Wearing Safety Gear[a]							
Pre-Test	67	3.51	1.397	3.599	.216	66	.001*
Post-Test	67	2.73	1.523				
Behavior #5: Riding an Adult-Sized ATV[b]							
Pre-Test	66	4.61	1.299	3.249	.205	65	.002*
Post-Test	66	3.94	1.984				

Note. * indicates statistical significance at the $p < .05$ level.
[a] indicates positively-associated behavior, where 0 = "I did not ride an ATV during the past 3 months," 1 = "Never," 2 = Rarely," 3 = "Sometimes," 4 = "Most of the time," and 5 = "Always."
[b] indicates negatively associated behavior, where 0 = "I did not ride an ATV during the past 3 months," 1 = "Always," 2 = "Most of the time," 3 = "Sometimes," 4 = "Rarely," and 5 = "Never."

Conclusions

The results of this questionnaire indicate that the school-based ATV safety training was marginally effective at increasing ATV safety knowledge, and was largely ineffective at changing ATV-related behaviors. Students who participated in the training at Coyle Middle/High school were almost equally divided among gender and grade, with students representing grades 6-12. Ages ranged from 11 to 18 years old and the majority of students either lived on a farm or in town. Out of four types of recreational motorized

vehicles, including youth-model ATVs, adult-model ATVs, sides by sides, and minibikes, trailbikes, and dirt-bikes, adult-model ATVs were most commonly reported as being both owned and operated by youth and their families. The prevalence of both ownership and use of youth-model ATVs was surprisingly higher than expected, indicating that a substantial number of youth within this population are riding appropriately sized machines.

In regard to ATV use, specifically for those students who reported riding ATVs within the past three months, students most commonly rode ATVs relatively infrequently and used ATVs primarily for fun. Students were less likely to own and/or borrow a helmet when operating and/or riding on ATVs. Nearly a quarter of students reported being involved in an ATV-related crash or accident and several had been injured. The overwhelming majority of students reported not having ever attended an ATV safety training, prior to the training offered as part of this study.

In regard to student's knowledge related to ATV safety, the results indicated some positive changes, yet largely demonstrated that there is significant room for improvement. If a letter grade were to be assigned to the percentages of correct responses, the results for the pre- and post-tests would indicate mixed effectiveness (Figure 5.3). Pre- and post-test results indicate that knowledge relating to helmet usage, carrying passengers, and riding appropriately-sized machines increased. A statistically significant difference was found between pre- and post-test results for wearing a helmet and carrying passengers, indicating that the level of knowledge pertaining to these behaviors were positively altered and that students understand that a DOT-compliant helmet is the most appropriate type of headgear to wear and that an ATV should only be

operated by one person at a time. It should be noted that while knowledge scores for each of these three risk factor areas did increase, their letter grades of "F" indicate that more work is needed to achieve higher overall training competency.

Interestingly, a very high percentage of students correctly identified public roads and/or highways as being an inappropriate location to operate ATVs during the pre-test survey, yet the percentage of correct responses during the post-test survey decreased slightly. The same results were true of responses related to safety gear usage, which yielded a statistically significant decrease in the percentage of correct responses. While both of these behaviors yielded the highest percentages of correct responses (out of all five risk factor areas), it is unclear why the percentage of correct responses *decreased* after participation in the training.

ATV Safety Report Card – *Knowledge*			
RISK FACTOR AREA	**PRE-TEST**	**CHANGE**	**POST-TEST**
Wearing a helmet	F	⬆	F
Carrying passengers	F	⬆	F
Riding on public roads and/or highways	B+	⬇	C+
Wearing safety gear	B-	⬇	C+
Riding adult-sized machines	F	⬆	F

Figure 5.3. Letter grades assigned for students' pre- and post-test ATV knowledge responses.

Similar to the results obtained for participants' ATV-related knowledge, students' reported behaviors indicate that there is still much room for improvement as demonstrated through their "report card" (Figure 5.4). Pertaining to the five key areas of

ATV usage behaviors examined for this study, and when analyzed in terms of either "never" exhibiting a behavior versus "rarely," "sometimes," "most of the time," or "always," exhibiting a behavior, students were more likely to not engage in positively associated behaviors, i.e. wearing a helmet or wearing safety gear. The highest percentages reported pertaining to wearing a helmet and wearing safety gear were for those students who reported "never" or "rarely" performing these behaviors. Students were also more likely to operate adult-sized ATVs (a negative behavior), where the highest percentages reported for both the pre-test and post-test were for those students who "always," "most of the time," or "sometimes" performed this behavior. Paired-samples t-test results reveal that there was a statistically significant difference between pre- and post-test results pertaining to these behaviors.

Students were more likely to not engage in two of the three negative behaviors, i.e. not carrying passengers and not riding on public roads and/or highways. The highest percentages reported for both behaviors from pre-test to post-test were for those students who indicated "rarely" or "never" carrying passengers or riding on public roads. However, paired-samples t-test results indicate that there was a statistically significant decrease between pre- and post-test scores pertaining to carrying passengers. It's possible that this decrease may be attributable to fewer participants actually riding and/or operating ATVs during the time that post-test data were collected. As the initial pre-test data were collected in October and post-test data were collected in January, winter weather and environmental conditions may have been a contributing factor.

ATV Safety Report Card – *Behavior*		
RISK FACTOR AREA	**PRE-TEST**	**POST-TEST**
Wearing a helmet	F	F
Carrying passengers	F	F
Riding on public roads and/or highways	C-	C-
Wearing safety gear	F	F
Riding adult-sized machines	F	F

Figure 5.4. Letter grades assigned for students' pre- and post-test ATV behavior responses.

Discussion

In terms of Kolb's (2015) experiential learning theory, whereby learners must grapple with the opposing dual dialectics of action/reflection and experience/abstraction in order for the process of learning to be achieved, students' perceptions of appropriate riding behaviors were challenged through participation in the ATV safety training. When examining the training in terms of the ELT cycle, students were able to grasp information via the modes of concrete experience and abstract conceptualization. The lesson was delivered using a teacher-centered, direct instructional approach, which utilized a lecture in the form of a PowerPoint presentation, coupled with static demonstrations and a worst-case-scenario type film. By utilizing probing questions to the audience, an opportunity was provided for students to actively reflect on their previous ATV-related experiences, or perhaps relate to the experiences of others they know. This begs the question, however, was it enough? As exhibited by the results of this study, the lack of congruency between participants' knowledge and behaviors may be indicative of a need for more purposeful and direct opportunities for reflection (Joplin, 1981).

Baker, Brown, Blackburn, and Robinson (2014) found that the type of reflection provided for students, particularly reflection-in-action, had a significant effect on students' knowledge acquisition scores. In order for youths' behaviors to change, more emphasis may need to be concentrated on implementing correct knowledge. Perhaps more opportunities for reflection *during* the experience itself (reflection-in-action), coupled with purposeful reflection *after* the experience (reflection-on-action), could lead to more significant mastery of content (Baker & Robinson, 2018).

It stands to reason then, that another component of the experiential learning cycle may have also been lacking – an opportunity to actively experiment with the concepts taught during the presentation. Students were given the information and were able to grasp it, but they lacked the opportunity to transform said information and actively apply it. Is it possible that because this training opportunity was offered as a mandatory school activity, where all students had to attend regardless of their interest in the subject matter, that many lacked the "self-initiated" (Rogers, 1969) drive to be genuinely interested in the subject matter?

In terms of Kolb's (2015) ELT learning spiral, youth who had already had experience with ATVs prior to participation in the training were able to add another iteration of ATV-related experience to their learning spiral (Kolb, 2015), thereby creating a richer and more broad base of experience from which to reflect upon. For many of these youth, it could be inferred that improper riding practices were already established prior to the training, either because they lacked appropriate instruction or were provided with inaccurate guidance. Those youth who had little or no prior experience related to ATV use had the opportunity to begin the first iteration of their ATV-related experiential

learning cycle, thereby creating an opportunity to learn safe and effective riding practices from the onset.

Implications/Recommendations for Future Research

Results from this study indicate that helmet usage is not a commonly adhered to practice and that many youth operate, or are passengers, on adult-sized ATVs. It should be noted that some of the behaviors exhibited by youth may be attributable to factors beyond the youth's control. Pertaining to helmet usage, literature has indicated that the reason why youth don't wear helmets is simply because they don't have helmets (National 4-H Council, 2003). In an effort to increase bicycle helmet usage, Morris and Trimble (1991) found that while education and awareness-raising alone did not effect any change in helmet use, offering a subsidized incentive for helmet purchases did elicit effective change. Similar results were obtained by DiGuiseppi, Rivara, Koepsell, and Polissar (1989), who found that reducing financial barriers to helmet purchases resulted in a significant increase in helmet use. Research related to reducing financial barriers to purchasing helmets for ATV use should continue to be explored.

Another factor that may contribute to continued use of inappropriately sized machines is the cost of ATV machines. Aitken et al. (2004) found that both youth and adult populations believed that enforcing size restrictions on ATVs would be ineffective due to the relatively high cost of the vehicles, especially when larger ATVs are needed for farm-related work. Cost can also be a prohibitive factor if purchasing multiple smaller ATVs for children (Aitken et al., 2004).

As suggested by Novak et al. (2003), additional research should be conducted related to the employment of broader, community-based trainings that involve not only

youth, but also parents and community leaders. When examining a promotional campaign to encourage bicycle helmet use by children, adoption was substantially increased when parents were actively involved in the campaign and were influenced to also wear helmets (DiGuiseppi, Rivara, Koepsell, & Polissar, 1989). An evaluation of the 4-H Community ATV Safety Program (National 4-H Council, 2003) found that both parents and youth recognize the need for adult supervision when operating ATVs and recommend that "there needs to be a change in attitude from complacency to awareness on the part of both parents and youth" (p. 15). Further research is needed to determine the underlying factors that contribute to unsafe ATV-related behaviors.

Similar to Aitken et al. (2004), who utilized focus groups to examine recommendations for increasing public awareness related to ATV usage, the researcher recommends utilizing a similar methodology to explore the underlying factors that contribute to unsafe ATV-related behaviors. A mixed-methods approach is suggested to generate a more comprehensive picture of the phenomenon of ATV usage among youth in Oklahoma.

Additional recommendations are to expand the scope of this study to include a substantially larger population of youth across the state of Oklahoma and also to explore additional types of experiential training opportunities, such as through the ASI ATV *RiderCourse*^{SM} training and the ASI online *e-course*. For future research, in order to increase post-test responses rates, the researcher recommends utilizing a retrospective pre-post analysis in order to measure participant responses both prior to and after the training, at one point in time, as opposed to two points in time. Similar to Baker and Robinson (2018), who utilized a six-week deferred post-test to compare direct and

experiential learning approaches, the researcher also recommends additional longitudinal post-test data collection.

As mentioned previously, the need for continued refinement of the study's survey instrument is acknowledged. The low Kuder-Richardson (*KR-20*) coefficients generated for questions related to ATV-knowledge indicates that this portion of the instrument needs to be reevaluated, or that other ATV-related knowledge instruments should be explored. A more extensive ATV knowledge test may be called for in order to truly measure mastery of content. The reader should interpret the results with caution owing to the limited generalizability of the population examined for this study.

The continued prevalence of injuries and fatalities related to ATV use among youth has been identified as an ongoing concern. It is imperative that continued efforts be made to provide effective educational programming to youth, as well as adults, regarding ATV safety. Research efforts should continue to be explored in the hopes of reducing the number of ATV-related injuries and fatalities.

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APPENDICES

APPENDIX A

PRE-TEST SURVEY INSTRUMENT

PRE-INTERVENTION OFF-ROAD VEHICLE SURVEY

1. Are you a boy or a girl? ☐ Boy ☐ Girl

2. How old are you? _____ years

3. What is your grade in school? _____

4. What school do you attend? _____

5. Where do you live? Check one answer: ☐ Farm ☐ Town ☐ City

6. Does your family *own* any of the following? Circle *all* that apply:


Youth-model ATV (all-terrain vehicle)


Adult-model ATV (all-terrain vehicle)


Side by Side (sport or utility)


Minibike, trailbike, or dirtbike

7. Have you ever *operated* (as **the** <u>driver</u>) any of the following? Circle *all* that apply:


Youth-model ATV (all-terrain vehicle)


Adult-model ATV (all-terrain vehicle)


Side by Side (sport or utility)


Minibike, trailbike, or dirtbike

8. Have you ever *ridden* (as **the** <u>passenger</u>) any of the following? Circle *all* that apply:


Youth-model ATV (all-terrain vehicle)


Adult-model ATV (all-terrain vehicle)


Side by Side (sport or utility)


Minibike, trailbike, or dirtbike

9. During the past 3 months, how many times did you ride an ATV, <u>either</u> as a driver *or* a passenger? Check only *one* answer:
☐ 0 times ☐ 1 to 10 times ☐ 11 to 20 times ☐ 21 to 39 times ☐ 40 or more times

10. Do you *own a helmet* for riding ATVs? Check *one* answer:
☐ Yes ☐ No → If <u>NO</u>, do you borrow a helmet to use? ☐ Yes ☐ No

11. When you drove or rode an ATV during the past 3 months, how often did you wear a helmet? Check only *one* answer:

- ☐ I did not ride an ATV during the past 3 months
- ☐ Never wore a helmet (0 out of 10 rides)
- ☐ Rarely wore a helmet (1 or 2 out of 10 rides)
- ☐ Sometimes wore a helmet (3-6 out of 10 rides)
- ☐ Most of the time wore a helmet (7-9 out of 10 rides)
- ☐ Always wore a helmet (10 out of 10 rides)

12. When you drove an ATV during the past 3 months, how often has a passenger ridden with you? Check only *one* answer:

- ☐ I did not ride an ATV during the past 3 months
- ☐ Never carried a passenger (0 out of 10 rides)
- ☐ Rarely carried a passenger (1 or 2 out of 10 rides)
- ☐ Sometimes carried a passenger (3-6 out of 10 rides)
- ☐ Most of the time carried a passenger (7-9 out of 10 rides)
- ☐ Always carried a passenger (10 out of 10 rides)

13. During the past 3 months, have you ridden an ATV on a public road or highway? Check only *one* answer:

- ☐ I did not ride an ATV during the past 3 months
- ☐ Never rode on a public road or highway (0 out of 10 rides)
- ☐ Rarely rode on a public road or highway (1 or 2 out of 10 rides)
- ☐ Sometimes rode on a public road or highway (3-6 out of 10 rides)
- ☐ Most of the time rode on a public road or highway (7-9 out of 10 rides)
- ☐ Always rode on a public road or highway (10 out of 10 rides)

14. When you rode an ATV during the past 3 months, how often did you wear safety gear (long-sleeved shirt, long pants, close-toed shoes, gloves, and/or goggles)? Check only *one* answer:

- ☐ I did not ride an ATV during the past 3 months
- ☐ Never wore safety gear (0 out of 10 rides)
- ☐ Rarely wore safety gear (1 or 2 out of 10 rides)
- ☐ Sometimes wore safety gear (3-6 out of 10 rides)
- ☐ Most of the time wore safety gear (7-9 out of 10 rides)
- ☐ Always wore safety gear (10 out of 10 rides)

15. During the past 3 months, how often have you ridden an adult-sized ATV? Check only *one* answer:

- ☐ I did not ride an ATV during the past 3 months
- ☐ Never rode an adult-sized ATV (0 out of 10 rides)
- ☐ Rarely rode an adult-sized ATV (1 or 2 out of 10 rides)
- ☐ Sometimes rode an adult-sized ATV (3-6 out of 10 rides)
- ☐ Most of the time rode an adult-sized ATV (7-9 out of 10 rides)
- ☐ Always rode an adult-sized ATV (10 out of 10 rides)

16. Have you ever been injured while riding or as a passenger on an ATV? Check only *one* answer:

☐ No ☐ Yes → If YES, how many times _____

17. If you were injured, did you go to a hospital and/or see a doctor? Check only *one* answer:

☐ No ☐ Yes

18. Have you ever attended a training related to ATVs? Check only *one* answer:

☐ No ☐ Yes

19. How do you use ATVs? Check *all* that apply:

☐ Fun ☐ Work on the farm/ranch ☐ Both ☐ Other _____

20. Which type of head protection should you wear when riding an ATV? Check only *one* answer:

☐ A bicycle helmet
☐ A sports helmet (football, baseball, etc.)
☐ Anything that covers my head is OK
☐ A Department of Transportation (DOT) compliant helmet
☐ I don't know

21. When operating an ATV, how many passengers is it okay to carry? Check only *one* answer:

☐ Me + 1 passenger
☐ Me + 2 passengers
☐ Me + as many as the ATV will hold is ok
☐ Me only

22. Which of the following places is NOT okay to operate an ATV? Check only *one* answer:

☐ ATV trails
☐ Public roads or highways
☐ Off-road locations
☐ Private property where I have been given permission to ride

23. What is the single most important piece of safety gear you can wear while operating an ATV? Check only *one* answer:

☐ Long-sleeved shirt and long pants
☐ Helmet
☐ Gloves
☐ Goggles
☐ Close-toed shoes

24. Which of the following is NOT a good way to determine if an ATV is the right size for you? Check only *one* answer:

☐ See if there is 3 inches of space between your pants' seat and the ATV's seat when standing
☐ Look at the minimum age label on the ATV
☐ Be able to grip the handlebars and move them all the way to the left or the right
☐ Size doesn't matter, as long as I can operate the ATV

25. Any questions, comments, or concerns?

APPENDIX B

POST-TEST SURVEY INSTRUMENT

POST-INTERVENTION OFF-ROAD VEHICLE SURVEY

1. Are you a boy or a girl? ☐ Boy ☐ Girl

2. How old are you? _____ years

3. What is your grade in school? _____

4. What school do you attend? _____

5. Where do you live? Check one answer: ☐ Farm ☐ Town ☐ City

6. Does your family *own* any of the following? Circle *all* that apply:


Youth-model ATV (all-terrain vehicle)


Adult-model ATV (all-terrain vehicle)


Side by Side (sport or utility)


Minibike, trailbike, or dirtbike

7. Have you ever *operated* (as **the** <u>**driver**</u>) any of the following? Circle *all* that apply:


Youth-model ATV (all-terrain vehicle)


Adult-model ATV (all-terrain vehicle)


Side by Side (sport or utility)


Minibike, trailbike, or dirtbike

8. Have you ever *ridden* (as **the** <u>**passenger**</u>) any of the following? Circle *all* that apply:


Youth-model ATV (all-terrain vehicle)


Adult-model ATV (all-terrain vehicle)


Side by Side (sport or utility)


Minibike, trailbike, or dirtbike

9. During the past 3 months, how many times did you ride an ATV, <u>either</u> as a driver *or* a passenger? Check only *one* answer:
☐ 0 times ☐ 1 to 10 times ☐ 11 to 20 times ☐ 21 to 39 times ☐ 40 or more times

10. Do you *own a helmet* for riding ATVs? Check *one* answer:
☐ Yes ☐ No → If <u>NO</u>, do you borrow a helmet to use? ☐ Yes ☐ No

11. When you drove or rode an **ATV** during the past 3 months, how often did you wear a helmet? Check only *one* answer:

- ☐ I did not ride an ATV during the past 3 months
- ☐ Never wore a helmet (0 out of 10 rides)
- ☐ Rarely wore a helmet (1 or 2 out of 10 rides)
- ☐ Sometimes wore a helmet (3-6 out of 10 rides)
- ☐ Most of the time wore a helmet (7-9 out of 10 rides)
- ☐ Always wore a helmet (10 out of 10 rides)

12. When you drove an **ATV** during the past 3 months, how often has a passenger ridden with you? Check only *one* answer:

- ☐ I did not ride an ATV during the past 3 months
- ☐ Never carried a passenger (0 out of 10 rides)
- ☐ Rarely carried a passenger (1 or 2 out of 10 rides)
- ☐ Sometimes carried a passenger (3-6 out of 10 rides)
- ☐ Most of the time carried a passenger (7-9 out of 10 rides)
- ☐ Always carried a passenger (10 out of 10 rides)

13. During the past 3 months, have you ridden an **ATV** on a public road or highway? Check only *one* answer:

- ☐ I did not ride an ATV during the past 3 months
- ☐ Never rode on a public road or highway (0 out of 10 rides)
- ☐ Rarely rode on a public road or highway (1 or 2 out of 10 rides)
- ☐ Sometimes rode on a public road or highway (3-6 out of 10 rides)
- ☐ Most of the time rode on a public road or highway (7-9 out of 10 rides)
- ☐ Always rode on a public road or highway (10 out of 10 rides)

14. When you rode an **ATV** during the past 3 months, how often did you wear safety gear (long-sleeved shirt, long pants, close-toed shoes, gloves, and/or goggles)? Check only *one* answer:

- ☐ I did not ride an ATV during the past 3 months
- ☐ Never wore safety gear (0 out of 10 rides)
- ☐ Rarely wore safety gear (1 or 2 out of 10 rides)
- ☐ Sometimes wore safety gear (3-6 out of 10 rides)
- ☐ Most of the time wore safety gear (7-9 out of 10 rides)
- ☐ Always wore safety gear (10 out of 10 rides)

15. During the past 3 months, how often have you ridden an adult-sized **ATV**? Check only *one* answer:

- ☐ I did not ride an ATV during the past 3 months
- ☐ Never rode an adult-sized ATV (0 out of 10 rides)
- ☐ Rarely rode an adult-sized ATV (1 or 2 out of 10 rides)
- ☐ Sometimes rode an adult-sized ATV (3-6 out of 10 rides)
- ☐ Most of the time rode an adult-sized ATV (7-9 out of 10 rides)
- ☐ Always rode an adult-sized ATV (10 out of 10 rides)

16. Have you ever been injured while riding or as a passenger on an **ATV**? Check only *one* answer:

☐ No ☐ Yes → If YES, how many times _____

17. If you were injured, did you go to a hospital and/or see a doctor? Check only *one* answer:

☐ No ☐ Yes

18. Have you ever attended a training related to ATVs? Check only *one* answer:

☐ No ☐ Yes

19. How do you use ATVs? Check *all* that apply:

☐ Fun ☐ Work on the farm/ranch ☐ Both ☐ Other _____

20. Which type of head protection should you wear when riding an ATV? Check only *one* answer:

☐ A bicycle helmet
☐ A sports helmet (football, baseball, etc.)
☐ Anything that covers my head is OK
☐ A Department of Transportation (DOT) compliant helmet
☐ I don't know

21. When operating an ATV, how many passengers is it okay to carry? Check only *one* answer:

☐ Me + 1 passenger
☐ Me + 2 passengers
☐ Me + as many as the ATV will hold is ok
☐ Me only

22. Which of the following places is NOT okay to operate an ATV? Check only *one* answer:

☐ ATV trails
☐ Public roads or highways
☐ Off-road locations
☐ Private property where I have been given permission to ride

23. What is the single most important piece of safety gear you can wear while operating an ATV? Check only *one* answer:

☐ Long-sleeved shirt and long pants
☐ Helmet
☐ Gloves
☐ Goggles
☐ Close-toed shoes

24. Which of the following is NOT a good way to determine if an ATV is the right size for you? Check only *one* answer:

☐ See if there is 3 inches of space between your pants' seat and the ATV's seat when standing
☐ Look at the minimum age label on the ATV
☐ Be able to grip the handlebars and move them all the way to the left or the right
☐ Size doesn't matter, as long as I can operate the ATV

25. Any questions, comments, or concerns?

APPENDIX C

IRB APPROVAL LETTER

Oklahoma State University Institutional Review Board

Date:	Wednesday, September 20, 2017
IRB Application No	AG1748
Proposal Title:	An Examination of the Effects of Experiential Approaches to All-Terrain Vehicle (ATV) Safety Trainings Among Oklahoma Youth
Reviewed and Processed as:	Expedited

Status Recommended by Reviewer(s): Approved **Protocol Expires: 9/19/2018**

Principal Investigator(s):

Haley Rosson
Stillwater, OK 74078

William G. Weeks
448 Ag Hall
Stillwater, OK 74078

The IRB application referenced above has been approved. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in section 45 CFR 46.

☐ The final versions of any printed recruitment, consent and assent documents bearing the IRB approval stamp are attached to this letter. These are the versions that must be used during the study.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be submitted with the appropriate signatures for IRB approval. Protocol modifications requiring approval may include changes to the title, PI advisor, funding status or sponsor, subject population composition or size, recruitment, inclusion/exclusion criteria, research site, research procedures and consent/assent process or forms.
2. Submit a request for continuation if the study extends beyond the approval period. This continuation must receive IRB review and approval before the research can continue.
3. Report any adverse events to the IRB Chair promptly. Adverse events are those which are unanticipated and impact the subjects during the course of the research; and
4. Notify the IRB office in writing when your research project is complete.

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the authority to inspect research records associated with this protocol at any time. If you have questions about the IRB procedures or need any assistance from the Board, please contact Dawnett Watkins 219 Scott Hall (phone: 405-744-5700, dawnett.watkins@okstate.edu).

Sincerely,

Hugh Crethar, Chair
Institutional Review Board

APPENDIX D

IRB APPROVAL MODIFICATION LETTERS

Oklahoma State University Institutional Review Board

Date:	Wednesday, October 18, 2017 **Protocol Expires: 9/19/2018**
IRB Application No:	AG1748
Proposal Title:	An Examination of the Effects of Experiential Approaches to All-Terrain Vehicle (ATV) Safety Trainings Among Oklahoma Youth
Reviewed and Processed as:	Expedited **Modification**

Status Recommended by Reviewer(s) **Approved**

Principal Investigator(s):

Haley Rosson
Stillwater, OK 74078

William G. Weeks
448 Ag Hall
Stillwater, OK 74078

The requested modification to this IRB protocol has been approved. Please note that the original expiration date of the protocol has not changed. The IRB office MUST be notified in writing when a project is complete. All approved projects are subject to monitoring by the IRB.

☐ The final versions of any printed recruitment, consent and assent documents bearing the IRB approval stamp are attached to this letter. These are the versions that must be used during the study.

The reviewer(s) had these comments:

Mod to conduct phase2 at Coyle Public Schools and to use a parent opt-out form.

Signature :

Hugh Crethar, Chair, Institutional Review Board

Wednesday, October 18, 2017
Date

Oklahoma State University Institutional Review Board

Date:	Monday, February 19, 2018	**Protocol Expires: 9/19/2018**
IRB Application No:	AG1748	
Proposal Title:	An Examination of the Effects of Experiential Approaches to All-Terrain Vehicle (ATV) Safety Trainings Among Oklahoma Youth	
Reviewed and Processed as:	Expedited **Modification**	

Status Recommended by Reviewer(s) **Approved**

Principal Investigator(s):

Haley Rosson
Stillwater, OK 74078

William G. Weeks
448 Ag Hall
Stillwater, OK 74078

The requested modification to this IRB protocol has been approved. Please note that the original expiration date of the protocol has not changed. The IRB office MUST be notified in writing when a project is complete. All approved projects are subject to monitoring by the IRB.

☐ The final versions of any printed recruitment, consent and assent documents bearing the IRB approval stamp are attached to this letter. These are the versions that must be used during the study.

The reviewer(s) had these comments:

Mod to add an incentive of $2 per participant

Signature :

Hugh Crethar, Chair, Institutional Review Board

Monday, February 19, 2018
Date

APPENDIX E

YOUTH ASSENT FORM

YOUTH ASSENT FORM
OKLAHOMA STATE UNIVERSITY

Dear Student,

We are interested in learning about all-terrain vehicle use (also known as ATVs or four-wheelers), of children your age. Whether you have ever ridden an ATV or not, we are interested in your experience with them. In order to understand this, we would like you to fill out some forms. Your parent/guardian is aware of this project.

Please understand that you do not have to do this. You do not have to answer any questions that you do not want to. You may stop at any time and go back to your classroom.

Your name will be the only identifiable information on the forms you fill out. Your responses will remain private and only the researcher will see them. If you have any questions about the form or what we are doing, please ask us. Thank you for your help.

Sincerely,

Haley Rosson
Ph.D. Candidate, Oklahoma State University

Bill Weeks, Ph.D.
Professor, Oklahoma State University

I have read this form and agree to help with your project.

_____
Your name

_____
Your signature

_____
Date

APPENDIX F

WILDLIFE EXPO POPULATION – PARENT CONSENT FORM

CONTACTS:
You may contact any of the researchers at the following addresses and phone numbers, should you desire to discuss your participation in the study and/or request information about the results of the study:

Haley Rosson, Ph.D. Candidate, 445 Ag Hall, Department of Agricultural Education, Communications, and Leadership, Oklahoma State University, Stillwater, OK 74078, (405)744-3036.

Bill Weeks, Ph.D., 444 Ag Hall, Department of Agricultural Education, Communications, and Leadership, Oklahoma State University, Stillwater, OK 74078, (405)744-5129.

If you have questions about your rights as a research volunteer, you may contact the IRB Office at 223 Scott Hall, Stillwater, OK 74078, 405-744-3377 or irb@okstate.edu

PARTICIPANT RIGHTS:
I understand that my child's participation is voluntary, that there is no penalty for refusal to participate, and that I am free to withdraw my permission at any time. Even if I give permission for my child to participate I understand that he/she has the right to decline.

CONSENT DOCUMENTATION:
I have been fully informed about the procedures listed here. I am aware of what my child and I will be asked to do and of the benefits of my participation. I also understand the following statements:

I have read and fully understand this permission form. I sign it freely and voluntarily. A copy of this form will be given to me. I hereby give permission for my child _____ participation in this study.

_____ _____
Signature of Parent/Legal Guardian Date

I certify that I have personally explained this document before requesting that the participant sign it.

_____ _____
Signature of Researcher Date

Would you be agreeable to allowing your child to complete a follow-up survey? If yes, please provide a mailing and/or e-mail address where we can most easily reach you:

_____ _____
Mailing address E-mail address

APPENDIX G

SCHOOL-BASED POPULATION – PARENT OPT-OUT FORM

PARENT/GUARDIAN PERMISSION FORM
OKLAHOMA STATE UNIVERSITY

PROJECT TITLE: An Examination of Experiential Learning Approaches to All-Terrain Vehicle (ATV) Safety Trainings Among Oklahoma Youth

INVESTIGATOR(S): Haley Rosson, Ph.D. Candidate, Oklahoma State University and Bill Weeks, Professor, Oklahoma State University

PURPOSE: Injuries and fatalities related to ATV usage among youth has been identified as an ongoing concern for not only the state of Oklahoma, but also the nation. This study will involve research to examine ATV usage behaviors among youth in Oklahoma and will also determine the effect that ATV safety trainings have on youths' knowledge and behaviors related to ATV safety. The study has several expected outcomes related to ATV safety and the safe operation of an ATV. We have developed an evaluation survey process that we would like your son/daughter to participate in. Your child is being asked to complete this questionnaire so that we can collect data regarding ATV usage in Oklahoma.

PROCEDURES: Your child will complete one questionnaire prior to beginning the ATV safety training. This questionnaire will ask about ATV use. If your child is willing to participate in a follow-up survey, we will administer the survey at school three months after participation in today's training. Each questionnaire will take approximately 5-10 minutes to complete.

RISKS OF PARTICIPATION: There are no known risks associated with this project which are greater than those ordinarily encountered in daily life.

BENEFITS OF PARTICIPATION: If you are interested, we would be happy to send you a copy of the results of the study when it is finished.

CONFIDENTIALITY: Your son/daughter's confidentiality will be maintained at all times during the evaluation. Your child will be asked to provide their name on the survey, but it will only be used to match the initial survey completed today with a follow-up survey. Your child's name will NOT be reported in any results. Written results will discuss group findings, not individual results. The records of this study will be kept private. Research records will be stored on a password protected computer in a locked office and only researchers and individuals responsible for research oversight will have access to the records.

COMPENSATION: There is no compensation for participating in this study.

CONTACTS: You may contact any of the researchers at the following addresses and phone numbers, should you desire to discuss your participation in the study and/or request information about the results of the study:

Haley Rosson, Ph.D. Candidate, 445 Ag Hall, Dept. of Agricultural Education, Communications, & Leadership, Oklahoma State University, Stillwater, OK 74078, (405)744-3036.

Bill Weeks, Ph.D., 444 Ag Hall, Department of Agricultural Education, Communications, and Leadership, Oklahoma State University, Stillwater, OK 74078, (405)744-5129.

If you have questions about your rights as a research volunteer, you may contact the IRB Office at 223 Scott Hall, Stillwater, OK 74078, 405-744-3377 or irb@okstate.edu

PARTICIPANT RIGHTS: I understand that my child's participation is voluntary and that there is no penalty for refusal to participate. I understand that he/she has the right to decline.

PARENT/GUARDIAN PERMISSION FORM
OKLAHOMA STATE UNIVERSITY

CONSENT DOCUMENTATION: I have been fully informed about the procedures listed here. I am aware of what my child will be asked to do and of the benefits of their participation. I also understand the following statement:

I have read and fully understand this letter. I am being asked to sign this form ONLY if I do NOT give permission for my child to participate in the following study.

I DO NOT give permission for my child _____ to participate in this study.

_____ _____
Signature of Parent/Legal Guardian Date

APPENDIX H

SCHOOL CONSENT LETTER

COYLE PUBLIC SCHOOLS

"HOME OF THE BLUEJACKETS"

P.O. Box 287
Coyle, Ok. 73027
Phone: 405-466-2242
Fax: 405-466-2448 or 405-466-9117
www.coyle.k12.ok.us

Superintendent: Josh Sumrall
Email: jsumrall@coyle.k12.ok.us

K-12 Principal: Patrick Smith
Email: psmith@coyle.k12.ok.us

October 16, 2017

Institutional Review Board
c/o Office of Research Compliance
Oklahoma State University
218 Scott Hall
Stillwater, OK 74078

Dear IRB Members,

After reviewing the proposed study, "An Examination of the Effects of Experiential Approaches to All-Terrain Vehicle (ATV) Safety Trainings Among Oklahoma Youth," presented by Haley Rosson, a Ph.D. candidate at Oklahoma State University, I have granted permission for the study to be conducted at Coyle Public Schools.

The purpose of the study is to determine the ATV usage behaviors among youth in Oklahoma, as well as the effect that ATV safety trainings have on youths' knowledge and behaviors related to ATV safety. The primary activity for this study will consist of students completing both a pre-test and post-test survey instrument related to ATV usage and participating in a school-based ATV safety training.

I understand that two surveys will be administered, one prior to participation in the ATV safety training (pre-test survey), and one approximately three months after participation in the ATV safety training (post-test survey). Students will participate in one ATV safety training, to be conducted on Monday, October 23, 2017.

I understand that Haley will provide parents with an adapted parent consent form, or opt-out form, notifying parents of the purpose of the study and what activities their child will be asked to complete. Parents will sign and return the form only if they do not provide consent for their child to participate in the study. Haley has agreed to provide to my office a copy of all Oklahoma State University IRB-approved, stamped consent documents before completing the aforementioned research activities. Any data collected by Haley will be kept confidential and will be stored on a password-protected computer in her locked office at Oklahoma State University. Haley has also agreed to provide to us a copy of the aggregate results from her study.

If the IRB has any concerns about the permission being granted by this letter, please contact me at the phone number listed in the letterhead above.

Sincerely,

Josh Sumrall
Superintendent
Coyle Public Schools

APPENDIX I

WILDLIFE EXPO ATV SAFETY TRAINING PHOTOS


Kawasaki
KFX

APPENDIX J

COYLE MIDDLE/HIGH SCHOOL ATV SAFETY TRAINING PHOTOS

VITA

Haley Nicole Rosson

Candidate for the Degree of

Doctor of Philosophy

Thesis: AN EXAMINATION OF TWO DIFFERING EXPERIENTIAL APPROACHES TO ALL-TERRAIN VEHICLE (ATV) SAFETY TRAININGS AMONG OKLAHOMA YOUTH

Major Field: Agricultural Education

Biographical:

Education:
Completed the requirements for the Doctor of Philosophy in Agricultural Education at Oklahoma State University, Stillwater, Oklahoma in May, 2018.

Completed the requirements for the Master of Science in Agricultural Education at Texas Tech University, Lubbock, Texas in 2013.

Completed the requirements for the Bachelor of Science in Interdisciplinary Agricultural Leadership at Texas Tech University, Lubbock, Texas in 2011.

Experience:
Graduate Teaching Assistant, August 2016 – May 2018
Dept. of Agricultural Education, Communications, and Leadership – OSU

Ag./4-H Extension Educator/County Extension Director, Nov. 2013 – Aug 2016
Oklahoma State University Cooperative Extension Service, Logan County, OK

Graduate Research Assistant, August 2011 – May 2013
Dept. of Agricultural Education and Communications – Texas Tech University

Professional Memberships:
Association of Leadership Educators
American Association for Agricultural Education
National Association of Extension 4-H Agents