A CASE STUDY EXAMINING THE HISTORICAL USE OF WAIST TETHERS AND ASSOCIATED TRAINING PRACTICES IN ADAPTIVE SKIING

by

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DEDICATION

I dedicate this to those who inspire and facilitate engaging educational experiences, motivate growth and learning in outdoor settings, and who encourage equity and access to all recreational activities.

ACKNOWLEDGEMENTS

I would like to acknowledge all the individuals who supported me on this educational journey. My husband, my mom, peers, advisor, and the kind folks at Eagle Mount.

VITA, AMERICAN INDIAN HERITAGE

I would like to acknowledge the traditional territories of the indigenous people of Southwest Montana, and the Gallatin Valley - once referred to as *The Valley of Flowers*. This area was considered sacred and neutral ground to many tribes including the Blackfeet, Crow, and Sioux peoples. I am grateful for the opportunity to share this amazing land.

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ABSTRACT

This case study investigated the historical application of and training practices revolving around waist tethers for students enrolled in Eagle Mount's multiweek ski program at Bridger Bowl in Bozeman, Montana. Historically, Eagle Mount trained all new volunteers to operate waist tethers to support students. Capitalizing on best practices working with adaptive skiers, it was hypothesized that this approach inhibited student autonomy and may not consider the student central to learning to ski. To learn more about this, Eagle Mount's Bridger Bowl Snowsports staff was interviewed, a restructured training model was examined, waist tether volunteers were questioned, and student lessons were observed. It was determined that waist tethers could limit autonomy and discourage a student's least restrictive environment. Yet, there are instances that these tools are appropriate based on the student's needs and to support their goals. Because the historic training model strongly emphasized the operational skills required to safely waist tether a student, it was possible that identifying student goals and crafting a unique progression that supported a student-centered experience may not have been the central message of volunteer training. As such, volunteers may have lacked the tools necessary to encourage an environment that inherently focused on progressions and highlights play and exploration via games and activities that capitalize on student interests. The restructured training environment required for all new volunteers made this the central element of the discussion. It provided volunteers with a toolbox of ideas to support safe and fun progressions based on students' needs and goals. As a result, fewer students currently use waist tethers, greater emphasis is placed on games and activities that engage students, and more time is spent by volunteers supporting student autonomy.

CHAPTER ONE

INTRODUCTION AND BACKGROUND

Context of Study

It is well documented that individuals participating in sports and recreation live longer, healthier, and happier lives. Slater and Meade (2004) state that "general population studies have shown that recreation is a chief determinant of life satisfaction above job, health, and financial resources" (p. 4). However, the Center for Disease Control (CDC) estimates that only 51.5% of American adults participate in the recommended 150 minutes of moderate physical activities or 75 minutes of vigorous aerobic exercise per week. This recommendation holds for all demographics and includes those living with disabilities (CDC, 2021).

An estimated 40.7 million individuals live with cognitive, developmental, or physical disabilities in the United States (Anti-Defamation League, 2021). These individuals can have difficulties with everyday movement patterns and sensory awareness, such as hearing or seeing, and may have trouble speaking, concentrating, remembering, or making decisions (CDC, 2021). In the United States, organizations and specialized programs recognize and adapt to these needs to help people with disabilities recreate in and out of doors and lead healthy, fulfilling lives.

In Bozeman, Montana, Eagle Mount is a local 501(c)(3) non-profit organization supporting individuals with disabilities and young people with cancer. Established in 1982, Robert Mathis and his wife Greta had a vision to "empower those with disabilities to mount up with wings as eagles" (Eagle Mount, n.d.) and knew that outdoor recreational activities were fundamental to this pursuit. Originally, Eagle Mount was a small ski program operating exclusively at the Bridger Bowl ski area. The program has grown to maintain a 19-acre campus

and offers approximately 20 programs throughout the year. These programs serve over 2,000 people annually. Programs are facilitated primarily by a volunteer corps of 1,994 individuals and are trained and supported by 20 full-time, year-round staff and five seasonal staff (Eagle Mount, 2021).

Eagle Mount's ski program has also expanded and now offers snowsports programs at two public ski areas, one private ski area, and one Nordic venue; Bridger Bowl and Big Sky Resort, the Yellowstone Club, and Crosscut Mountain Sports Center, respectively. In 2022, Eagle Mount's snowsports program provided approximately 1,500 lessons to 246 students, supported by 345 volunteers. At Bridger Bowl, 171 individuals participated in 940 ski lessons and were supported by 228 volunteers (Eagle Mount, 2022).

Eagle Mount snowsports programs value safety and fun to promote learning and encourage thoughtful student-centered experiences focusing on the unique abilities of students, not their disabilities (Eagle Mount, 2021). Eagle Mount's snowsports students range in their physical, developmental, and cognitive ability and present with various tools or equipment to support their downhill adventures. Many, however, only seek a trusted support system and careful guidance to open the door to adventure and use the same equipment as most individuals recreating at the ski hill. This study focused on students and volunteers who have historically utilized waist tethers.

The Professional Ski Instructor of America (PSIA) Adaptive Alpine Technical Manual defines tethers as "two individual lengths, or one continuous length of webbing that can be attached to ski tip connectors (Figures 1), a slider apparatus (Figure 2), or a bi-ski (Figure 3).

Figure 1. Ski tip tethers (Solent Ski Club, Gallery, 2022).

Figure 2. A slider (Adaptive Technical Manual, 2017, p. 94).

Figure 3. Bi-ski with tethers (Adaptive Skiing, Oregon Adaptive Sports, n.d.)

Tethers enable the instructor to assist skiers through turns and are also used for speed control” (p. 39). PSIA further identifies tethers as “a teaching tool that provides kinesthetic cues for students as they build skills, confidence, and, potentially, independence" (p. 43). Eagle Mount primarily uses waist tethers to assist stand-up skiers. In this case, the webbing attaches to the student's waist via a climbing harness (Figure 4). PSIA explicitly notes that a waist harness “should not be used as an anchor point for teaching as that can pull the student aft of center, restricting the ability to ski in a fundamentally correct manner” (p. 35).

Figure 4. Waist tethers (Augst, 2022).

Eagle Mount volunteers have used waist tethers for many years. The program's Recreation Assistant Director states that:

> Overwhelmingly, tethers are being used as a blanket strategy for students, whether or not they have any physical reason that they would benefit from the use. [The] use of tip tethers is relatively rare. Large numbers of our students are being tethered from the waist, attached to a climbing harness that the student wears. This is not the industry standard and seems to be a uniquely Eagle Mount procedure based on old patterns and self-perpetuating dependency. So many students were being "taken for a ride" instead of coached on how to ski for so many years that the program needed many volunteers who could do this safely. Therefore, training on coaching skills was scrapped and replaced with tethering clinics. This became the primary tool provided to volunteers, and without the training in coaching skills, students were not offered many opportunities to progress. It seems that tethers were introduced for most students, including those with communication challenges, learning disabilities, and challenging behaviors.

Instead, a plan should be in place to reduce dependency on the device and encourage as much autonomy and self-control as possible (Adaptive Alpine Technical Manual, 2017). Eagle mount has begun implementing changes to its training structure that aims to help volunteers understand the intended application of tethers and provide the tools necessary to create a student-centered learning environment that concentrates on fun and play to encourage autonomy.

Focus Question

My focus question was to determine the effects of moving from an operational training model to a student-centered training model on student autonomy.

CHAPTER TWO

CONCEPTUAL FRAMEWORK

A Brief History of Skiing

"The origins of skiing are bound up with the emergence of modern man," states Roland Huntford (2008, p. 2) in *Two Planks and a Passion: The Dramatic History of Skiing*. It is believed that the story of skiing began in the last Ice Age, 22,000 years ago, predating the advent of the wheel. Archeologic evidence suggests that Paleolithic reindeer hunters traveled across the tundra in the winter using Stone Aged skis to sustain life in the cold climate where they lived and hunted. A cave drawing from 2000BC found in Zalavruga, Russia depicts this Stone Age story (Figure 5).

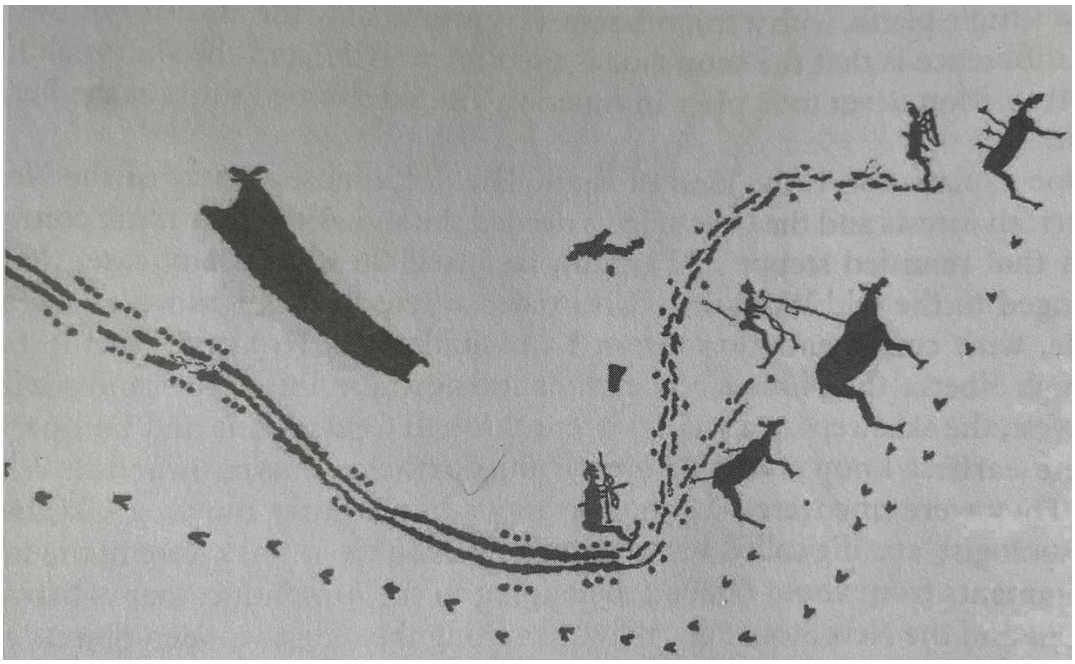

Figure 5. Cave Drawing, Zalavruga, Russia, Rock drawing c. 2000BC. *Haddon Library, University Cambridge* (Roland, 2008, p. 6).

It was not until the 1500's that skiing was illustrated in print. The Norse culture of the Middle Ages depicts maps with men on ski-like sticks frolicking in the outdoors (Figure 6). In 1539 the first annotated map of the North, the *Carta Marina*, was published in Venice and was the first map of Scandinavia authored by a Swede named Olaus Magnus. Simultaneously, *Opera Breve*, printed in both German and Italian, described figures on a map who:

> …have on their feet pieces of wood on which they run with great speed over the snow…besides being able to move at breakneck speed on the flying pieces of wood, they also, and this pleases them greatly, go quickly wherever they wish, and have the greatest ability to advance and retreat at will…with the aid of these pieces of wood, they attain the greatest skill in attacking and fleeing (Roland, 2008, p. 33).

Figure 6. Olaus Magnus, *Carta Marina*, 1539. *Cambridge University Library* (Roland, 2008, p. 34).

During this time, skiing was first referenced in combat and the military. In 1733, Norwegian Soldiers under the command of Major Henrik Emahusen standardized ski drills for his regime. Kick-turns, which are stilled used today, have origins in this formalization. Standardization of what ski equipment should be made of and how they should perform was also defined. By the 1760s Norwegian troops were competing in race-like shooting drills, skiing downhill, through

trees, and across snowfields for prizes. These events were the precursor to the modern Olympics and were the first known events to incorporate timing and terrain navigation, including jumps and bumps. Such events propelled the evolution of skiing as a pastime in Norway and Europe in the mid-1800s. Formal ski areas emerged as more people began participating in downhill skiing as a recreational activity (Fry, 2010). In 1938, the chairlift was invented in the United States (Sood, 2010).

Adaptive Snowsports

Many attribute the return of thousands of veterans after World War II (1939-1945) to have fueled the interest in recreating in the mountains and contributed to the growing popularity of snowsports. As alpine skiing was gaining popularity worldwide, injured military veterans were at the forefront of establishing and promoting adaptive snowsports. Disabled-World was established to support the growing movement and defines adaptive snowsports as the use of:

> Special adapted equipment to allow people with a wide range of disabilities to take to the snow and experience the freedom of snowsports in the least restrictive manner possible. Winter sports such as adaptive snow skiing, snowboarding, and a variety of sit-ski options are now available to many people with disabilities.

Legally and as defined by the Americans with Disabilities Act (ADA), “a person with a disability…has a physical or mental impairment that substantially limits one or more major life activities” (Disabled World, 2017, p.1).

With the advent of adaptive snowsports, the demand for suitable equipment arose. Franz Wendel, a German war veteran, has been memorialized as one of the first individuals to craft gear to adapt to his injuries. Wendel lost his leg in combat but was bound and determined to ski. He attached short skis to the bottom of his crutches to assist him in balancing on one leg while skiing downhill. His creation is now considered the advent of outriggers, which are still used

today (Masson, 2021). In 1942, Wendel competed against able-bodied skiers, making him the first adaptive skier to enter a downhill ski competition (Jessen, n.d.).

In 1948, Dr. Ludwig Guttman of the spinal injuries center at the Stoke Mandeville Hospital in Great Britain organized the first competitive event for athletes in wheelchairs, the Stoke Mandeville Games. The event coincided with the Olympics games in London. One source states that this "demonstrated to the public that competitive sports are not the prerogative of the able-bodied, but that the severely disabled, even those with such magnitude as spinal paraplegics, can become sportsmen and women in their own right" (Mitch Medical, 2022, p. 1). This event gave rise to the first Paralympic Games in Rome, Italy, in 1960. The International Paralympics now occur every four years, alongside the International Olympics Games. Participation and international support have increased exponentially since its inception (International Paralympic Committee, n.d.).

The latter half of the 20th century gave way to legislation for and public interest in the rights of persons with disabilities worldwide. In the United States, three notable legislative accomplishments supporting persons with disabilities include (Adaptive Sports USA, 2020):

- 1968: The Architectural Barriers Act (ABA) required all federally funded facilities and buildings to be made accessible. Renovations could be made with federal funding. This was the first measure by Congress to ensure access to buildings for people with disabilities.
- 1973: Section 504 of the Rehabilitation Act was one of the first federal rights laws in the U.S. that prohibited discrimination based on disability. Section 504 provided the framework for what would become the Americans with Disabilities Act.
- 1990: The Americans with Disabilities Act (ADA), signed by President George H. W. Bush, prohibits discrimination against people who have disabilities and outlines "comprehensive civil rights protections for individuals with disabilities in the areas of employment, public accommodations, State and local government services, and telecommunications" (American with Disabilities Act, 1991, p.1).

Section 504 and the ADA state that ski areas operating under a special-use permit from the U.S. Department of Agriculture (USDA) Forest Service must uphold standards that promote program

accessibility for all demographics. The Accessibility Guidebook for Ski Areas Operating on Public Lands (2015) states that “program access means that a person with a disability has an equal opportunity to participate and gain the same benefit offered by a program or service” (p. 1). Programs to support people with disabilities have been implemented at ski areas and public lands across the country. Though a comprehensive list does not seem to exist, at least 96 adaptive snowsports programs exist at ski hills throughout the United States (Move United, 2021).

Professional Ski Instructors of America

Eagle Mount and ski programs across the United States rely on foundational instruction models developed by PSIA. These student-centered models rely on learning and teaching theory to guide skill progressions that cater to individual students and embrace safety and fun to promote learning. PSIA defines student-centered teaching as “an approach in which the instructor recognizes and responds to students’ motivations and goals by tailoring experiences with consideration of the physical, mental, and emotional needs of the student” (Teaching Snowsports Manual, 2017, p. 260). Service marked by PSIA in 2015, The Learning Connection has been developed to provide an overarching framework that defines best practices in snowsports instruction (Figure 7). The model looks closely at the decisions and behaviors of an instructor that promote safety and fun and considers each unique person's goals. With students at the center of the equation, instructors can blend People Skills, Teaching Skills, and Technical Skills to create an engaging atmosphere that fosters learning (Teaching Snowsports Manual, 2017).

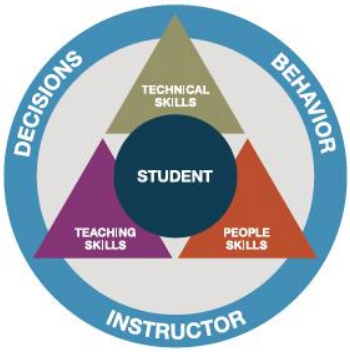

Figure 7. The Learning Connection (Teaching Snowsports Manual, 2017, p. 14).

People Skills are simple ways to build the trusting relationship required for enjoyable outcomes. Emotional intelligence is the central objective and is “the capacity to recognize and understand emotions in yourself and others, manage your own emotions, and influence the emotions of others” (Teaching Snowsports Manual, 2017, p. 258). This requires special attention to the words used to communicate and characteristics of nonverbal communication that portray honesty, transparency, empathy, patience, and respect, to name a few (Teaching Snowsports Manual, 2017).

Teaching Skills are broken into two parts, learning and teaching. The Teaching/ Learning Cycle best defines this concept and outlines logical steps to answer the essential question; what does the student want to do, and how do we get there (Figure 8)?

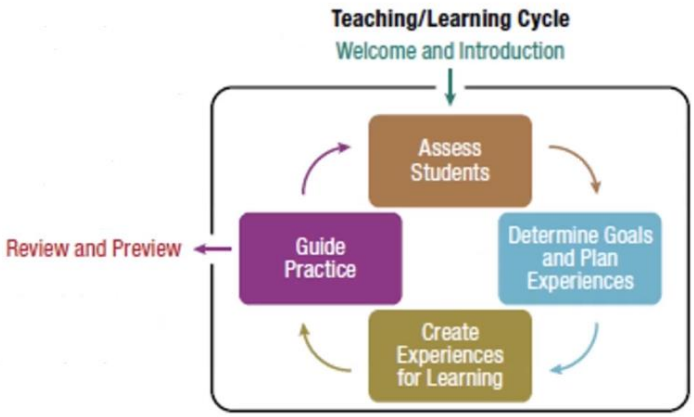

Figure 8. The Teaching/ Learning Cycle (Teaching Snowsports Manual, 2017, p. 84).

Welcoming a student is vital with every lesson. It begins establishing trust and rapport and initiates the assessment process. Assessing a student is foundational to start outlining a teaching approach. When preparing for an adaptive lesson, the assessment starts well before the lesson begins and includes the student's medical diagnosis and history, level of cognition, communication abilities, physical implications, and goals. The PSAI Adaptive Alpine Technical Manual (2017) outlines four specific areas of assessment:

1. Cognitive ability – communication and learning styles
2. Affective assessment – emotions that may influence behavior
3. Medical and medication implications
4. Physical ability – muscle control, range of motion, mobility, balance (pp. 19-33)

These elements, referred to by Eagle Mount as the CAMP model, help instructors identify what a student can do and how to teach to those strengths. Clothing, equipment, and general demeanor should also be assessed. Understanding how students feel, their needs, desires, knowledge of the sport, current performance level, and willingness to overcome challenges are essential in planning an experience to help attain their goals (Teaching Snowsports Manual, 2017).

The next step in the model creates experiences for learning. Instructors implement obtainable short-term objectives that match an individual's current ability level and are acceptable from an emotional and physical standpoint. PSIA believes that play, experimentation, and exploration are foundational attributes in all learning progressions and uses information gathered in the assessment to craft games, activities, and creative and engaging tasks. This includes using visual, auditory, and kinesthetic (VAK) cues to teach skiing skills in a way that allows students to perceive and process information in their unique way. Learning is broken down into four styles: feeling, watching, thinking, and doing. "The current accepted theory is that all these styles are required for a complete learning experience" (Teaching Snowsports Manual, 2017, p. 56). Considering how people learn and what elements aid in the absorption of information allows instructors to guide student engagement in learning (Teaching Snowsports Manual, 2017).

The third component of the Learning Connection, Technical Skills, helps guide what to teach, while the previous two lay the groundwork for how to teach. This area provides insight into the mechanics of skiing. It outlines five fundamental skills that allow instructors to accurately assess student skills, develop a progression that uses the most appropriate terrain, and focus on the most efficient techniques to keep students safe (Table 1). PSIA's Fundamental Mechanics of Skiing Across Adaptive Disciples (n.d) states that the fundamentals are "built on the principle of a student-centered learning partnership that adheres to a guiding set of skiing mechanics. The five fundamentals of skiing relate to every desired outcome for all students, including those using adaptive equipment" (p. 2). A framework has been created to visualize the fundamentals related to adaptive alpine skiing (Figure 9).

Table 1. The five alpine skiing fundamentals (Teaching Snowsports Manual, 2017, p. 142).

Pressure Control	Control the relationship of the center of mass to the base of support to direct pressure along the length of the skis. (Fore/aft pressure)
Pressure Control	Control pressure from ski to ski and direct pressure toward the outside ski. (Ski to ski pressure)
Edge Control	Control edge angles through a combination of inclination and angulation.
Rotational Control	Control the skis rotation with leg rotation, separate from the upper body.
Pressure Control	Regulate the magnitude of pressure created through ski/snow interaction. (Overall magnitude of pressure)

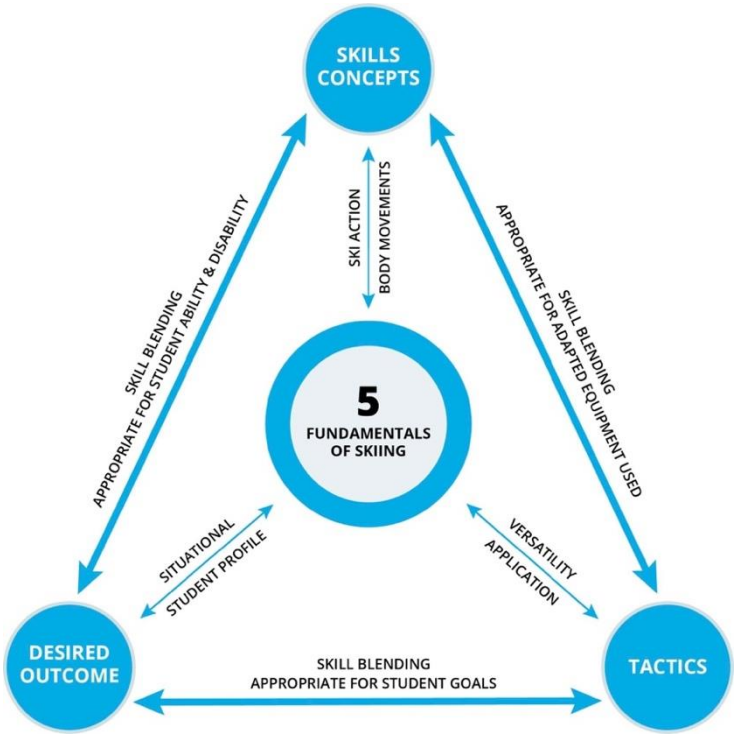

Figure 9. The fundamentals of alpine skiing developmental framework for adaptive skiing (Adaptive Alpine Technical Manual, 2017, p. 12).

CHAPTER THREE

METHODOLOGY

Demographics

The 2022 Eagle Mount Tether Focus Group consisted of three students and three volunteers*:* student one (S1) is a 19-year-old male. He has Cerebral Palsy, which affects his posture, strength, and coordination. Student two (S2) is a 16-year-old male. He has Autism and Apraxia, which affects his cognition, physical coordination and stamina, and speaking ability. Student three (S3) is a 17-year-old female. She has Autism and Epilepsy, which affect her verbal communication and coordination. The students were from the Bozeman High School Special Education Program and participated in the program between January 18 and March 8, 2022.

Volunteer one (V1) has been with the program for 11 years and is male. Volunteer two (V2) has been with the program for nine years and is male. Volunteer three (V3) has been with the program for seven years and is female. V1 was paired with the S1, V2 with the S2, and V3 with S3.

Students are typically paired with one returning volunteer and, when possible, one new volunteer; I was the new volunteer when I observed teams. Eagle Mount strives to maintain student and volunteer pairs from year to year and throughout the eight-week program. This provides consistency so teams can pick up where they left off and continue to build on progressions. This was the first time these teams worked together and were paired throughout the eight-week program.

The research methodology for this project received an exemption from Montana State University's Institutional Review Board, and compliance for work with human subjects was maintained (Appendix A).

Data Collection and Analysis Strategies

Eagle Mount's Recreation Director and Recreation Assistant Director were interviewed separately to gather historical knowledge of tether use and understand the desired culture shift for using waist tethers (Appendix B). They were asked to define waist tethers, who uses them, the goal of their use at Eagle Mount, and how waist tethers support or hinder students. They were also asked about training module changes and how they thought it would impact the culture shift.

Four days of on-snow training were observed; Train-the-Trainer, Return to Stand up Tethering, and two days of New Volunteer Snowboard training. These clinics aimed to bring awareness to student-centered teaching, explored the teaching/ learning models outlined by PSIA, acknowledged the fundamental movements necessary to guide progressions, provided opportunities to be creative, and facilitated games and activities structured around students' likes, needs, and abilities.

The Waist Tether Volunteer Early Season Questionnaire gathered information about; volunteer tenure, motivation for volunteering, takeaways from preseason training, and any considerations they may have for instructional methods they anticipated using in the upcoming season (Appendix C). The Waist Tether Volunteer Postseason Questionnaire asked waist tether volunteers to reflect on the season, offer insight on the value of participating in the program, elaborate on learning styles that best accommodated the student, and assess goal outcomes (Appendix D).

Questionnaires were distributed to returning volunteers who anticipated working with waist-tethered students at the season's beginning and end. Both questionnaires were distributed in three ways; I provided volunteers with a paper copy of the questionnaire and encouraged them to complete it and return it to a designated location. I also drafted an email and had it sent to the tether volunteer list by Eagle Mount staff. The email identified three ways to complete the survey; a link to a google form, obtaining a paper copy from a described location in the Eagle Mount hut at Bridger Bowl, or printing the attached PDF and returning it to a designated folder in the Eagle Mount hut at Bridger Bowl. At the end of the season, a follow-up email was sent less than a week following the initial email, and time was spent at end-of-season social events to touch base with volunteers who may not have completed the questionnaire. A final effort was made by calling volunteers to remind and encourage them to please take a moment to complete the form and inquire how I could support their effort.

Postseason interviews were conducted with the focus group volunteers at the end of the program (Appendix E). Two interviews took place in the hut following the final lesson, and the third, due to scheduling, was administered via email. During these interviews, volunteers reflected on successes and challenges they may have encountered with their students and spoke about the goals set early in the season. The interview asked about student use of waist tethers historically, if it was known, and where students were currently. Volunteers were also asked what coaching techniques or progressions influenced student goals or enhanced their ability to become more independent of the tethering device and where they might be able to focus in the future.

Real-time observations of the focus group helped determine what characteristics of the lesson provided noticeable gains and how that was accomplished. The Observation Journal

describes the cause-and-effect relationships that influenced the students desired goals for the season and the techniques volunteers used to support those goals (Appendix F). The use of progressions and the use of the five fundamentals of alpine skiing were noted.

Triangulation Matrix

Table 1. Triangulation Matrix. Data collection methods for analyzing the research question.

Research Question	Data Collection Methods		
	Source 1	Source 2	Source 3
What are the effects of moving from an operational training model to a student-centered training model that impact student autonomy?	Eagle Mount program lead interviews; preseason training observations	Early season and postseason questionnaires	Observation journal

CHAPTER FOUR

DATA ANALYSIS

Preseason Program Lead Interviews

The Recreation Assistant Director described tethering as a physical assist used to support skiers. In its most basic form, it is used as a teaching tool to provide kinesthetic cues for students. She stated that "tethers should never be used as a primary source of speed control." They acknowledged that tethers are primarily used to support the progression of standup skiers learning to turn, control their speed, and safely come to a stop. Tethers are also used with equipment that does not have breaks, such as sliders and bi-skis. When asked how tethers support or hinder students, they said tethers, particularly tip tethers, can be a temporary tool that helps students learn to feel the necessary movements to turn their skis and stop. With a progression plan that encourages autonomy, this tool can be used minimally or removed over time. Conversely, waist tethers allow a volunteer to take a student to terrain beyond their abilities. This can make students dependent on volunteers and tethers and inhibit progression and independence (Table 2).

Table 2. How tethers support or hinder student growth and autonomy.

Support	Hinder
Acts as a kinesthetic cue to guide the feeling of turning	Adds a restrictive device
Aids in leg and ski rotation, helping to turn	Can lead to physical or mental dependencies
Supports a weaker side of the body	Encourages inefficient body mechanics that can be dangerous
Helps operate equipment that does not have the ability to break, such as sliders and bi-skis	Skips steps in the fundamental progression of skiing
	Allows students to be taken to terrain that they would not otherwise be able to ski
	Encourages flat skis rather than edge control
	Encourages volunteer dependence

The Recreation Director and Recreation Assistant Director agreed that a plan must be in place to remove them or create proper challenges whenever tethers are added. They reinforced that this element has not historically been part of the methodology at Eagle Mount and that students are being held back as a result. The Recreation Assistant Director recalls last season's waist-tethered student numbers, 11 of whom started on tethers. By the program's end, nine students were skiing independently.

The leadership team has focused on two objectives to support student independence. First, to help families and volunteers understand the current conversation around waist tethers and create a personalized tether plan or progression plan in collaboration with students, their caregivers, and staff to help the student reach their goals. The second is to coach volunteers to use individualized coaching techniques emphasizing games and activities and explore creative strategies to develop skills while maintaining fun and joy.

The desired culture shift is to move away from the historical perception that if you come to Eagle Mount, someone is going to ski you round on waist tethers and instead focus on an environment that doesn't put limits on people with disabilities; allowing them to grow and learn

and make mistakes and fall and get up and keep going, hopefully with a smile on their face. The Recreation Assistant Director emphasized the importance of creating adaptive solutions *with* students, not *for* them. The Recreation Director stated that it has been very unclear in the past whether waist tethering was for the volunteer or the student.

When asked how they plan to make the culture shift, they explained the changes implemented over the past two years. Volunteer training has focused on the difference between operating waist tethers to control a student as they descend the mountain to coaching and teaching the student using tethers. This shift aims to help volunteers understand why waist tethers are used in their intended form.

The team has witnessed a high acceptance among new and returning volunteers regarding the collaborative teaching and learning concepts presented in training. However, many returning volunteers are more resistant to the changing culture. Some returning volunteers have expressed that adding structure removes fun. Statements like this support the notion that volunteers have enjoyed the feeling they get by doing something *for* the student versus *with* the student. This is the culture that the organization wishes to change.

Preseason Training Observations

Before the on-snow training, Eagle Mount hosted three webinars orienting new volunteers to the Eagle Mount Snowsports Program and introducing the perspectives of adaptive athletes. The first webinar provided a basic understanding of the Eagle Mount mission, introduced the snowsports staff, and outlined the program. The latter two introduced two athletes with disabilities. The athletes expressed their love for sports, gave first-hand insight into how

adaptive athletes think and feel, and offered advice about how they wanted to be treated in the recreational world.

New volunteers were also directed to the PSIA website, where they could explore the elements of the Learning Connection and were introduced to the Teaching/ Learning Cycle. Through a series of videos and interactives, the skills of being a snowsports instructor were introduced, and a base of knowledge was presented.

Train-the-trainers gathered all the volunteers who would be leading new volunteer training. The team congregated on snow for three days. Day three of train-the-trainers was observed for this study. The desired outcomes for this training were as follows:

1. Assess skiing skills and demonstrate rotary, edging, and pressure movements through the use of drills and activities,
2. Describe the fundamental skiing skills concepts (Rotary, Edging, and Pressure) through the use of exercises and tasks,
3. Describe movement patterns humans make (flex, extend, rotate),
4. Demonstrate safety and risk reduction:
    a. Integrate the 7 points of the Skier Responsibility Code,
    b. Getting up from a fall,
    c. Picking appropriate terrain and progressions.
5. Understand how to create the beginner progression experience:
    a. Demonstrate an understanding of the teaching cycle,
    b. Demonstrate basic knowledge of the CAMP model,
    c. Demonstrate the ability to provide a fun environment,
    d. Put into practice the beginner progression,
    e. Apply visual, auditory, and kinesthetic cues.

The day started by checking in with each other on the chairlift and sharing information about our 10-year-old selves. Such as what you liked to do, how you would describe yourself, and how you remember acting; inviting volunteers to recall the things that brought them joy and how they remember thinking at that age.

The remainder of the day was spent exploring the magic carpet and creating games and tasks that addressed the goals and created a fun experience for our 10-year-old selves. In the

spirit of games and activities, the Recreation Director would challenge small working groups to craft activities encouraging movement patterns that worked towards different aspects of the skiing skills concept. For example, my group was given a scenario where the student had trouble turning their skis because they were in the “backseat.” A common occurrence with beginner students and those using waist tethers. Considering the alpine skiing fundamentals, the student was not controlling the relationship of the center of mass to the base of support to direct pressure along the length of the ski. The team worked through an activity that asked the student to “high-five” or reach out to the volunteer at the initiation of the turn, causing them to lean forward by flexing their knees and ankles and focusing their weight in the direction of the high-five and over the turning edge. The day proceeded in this fashion. Groups worked through scenarios that allowed them to be creative using visual, auditory, and kinesthetic cues and encouraged play and experimentation to promote movement patterns that influenced the development of their skiing skills. Props that Eagle Mount has available for volunteer use were also introduced, and tips were given identifying ways they could be used based on past successes.

In the day's wrap-up, an Occupational Therapy model was introduced, reinforcing the idea that “when we achieve a level of play, the gains extend beyond just their ski skills " (Figure 10). There are noticeable gains in independence, confidence, and joy (Eagle Mount, New Volunteer Training Outline, p. 7).

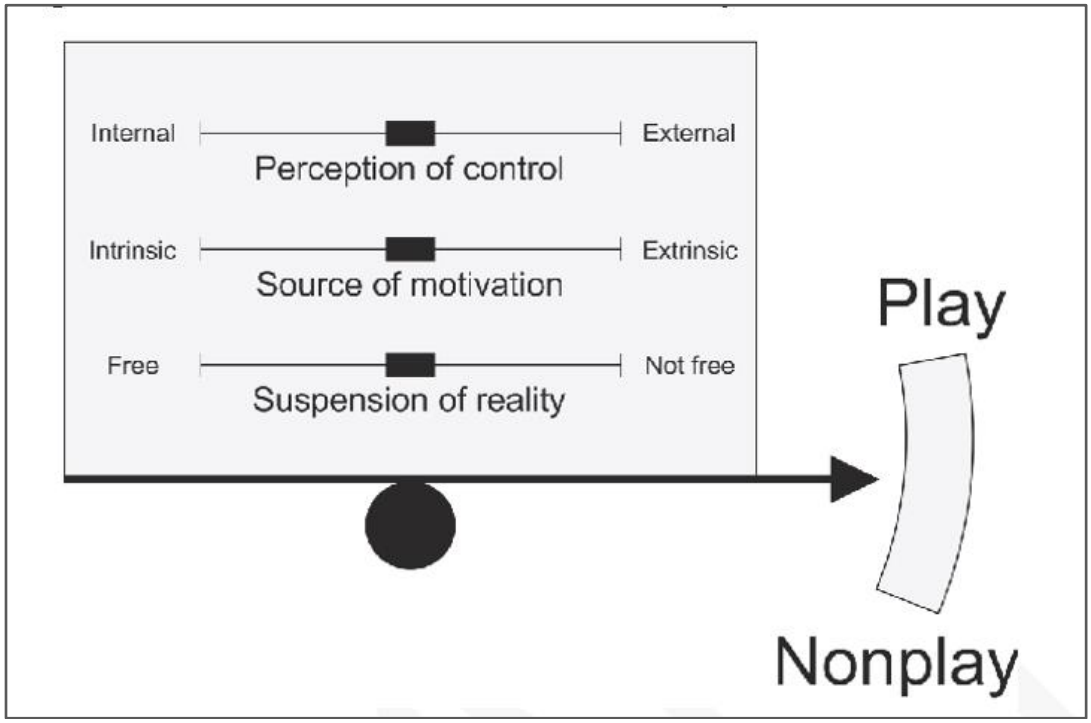

Figure 10. Play versus nonplay (Eagle Mount, New Instructor Training Outline, 2021).

In January 2022, Eagle Mount invited all the returning volunteers who have used tethers in the past and anticipated supporting volunteers who were new to tethering to spend a day at Big Sky reviewing and practicing the fundamental ski skills and techniques to be successful at tethering. The clinic "focused on the safe operation of tethers as well as the coaching concepts specific to this equipment."

The day started indoors with the 2021 success story of how nine of the 11 students on waist tethers at the beginning of the season became independent by the end of the eight-week program. The team was reminded to ask themselves what the students' goals are, who the tethers are for, and at the end of the day to look inward to ask, "did I coach today, or did I drag someone around on ropes?" They discussed how waist tether dependency could create a false illusion of control that can be hard to unteach. Following this conversation, a volunteer expressed her

appreciation of the new and fun focus of training and how she loved all the games. This volunteer has been with the program for many years and was in favor of the new approach.

Before heading outside, we evaluated an Emoji Feeling Chart and picked an emotion that matched how we were feeling at that time (Figure 11). This became the suggested chairlift conversation for the team's first ascent up the mountain.

Figure 11. Emoji feelings card (99worksheets.com, 2022)

At the top, the team honed in on the body movements foundational to safely performing the required technical skills to waist tether a student. Analogies were used, and guided practice was promoted. Everyone appeared to be having fun and learning. The group continued practicing the ski skills required to safely support students on tethers; side slipping, breaking wedges, gliding wedges, wedge change-ups, and hockey stops. These rudimentary skills are essential to keeping a student safe if a volunteer needs to stop or slow a student down.

In preparation for tethering, the group did some synchronized skiing to mimic the spatial relationship between the volunteer and the student. This allowed volunteers to experience the sensation of being tethered. The experience was discussed and built upon, and a plan was established for how to proceed. The pairs continued to play and experiment as they descended. Waist tethers were brought out and used on this run as well.

Returning to the beginner area, the group discussed tip tethers as a teaching tool, reviewed who they were best suited for, and practiced using them. During this time, the group was reminded of the operational aspects required for every tether lesson, beginning with inspecting the tethering equipment. Groups reviewed and practiced correct positioning of the volunteer behind the student and managing slack in the tethers to accommodate lesson progressions focused on visual, auditory, and kinesthetic cues and the relationship to turn shapes that dictate safe skiing.

Ski fundamentals were addressed, and time for guided practice using scenario-based objectives was included. Time was spent discussing scenarios that put the volunteer in a position that is possibly not safe or healthy for their bones and joints. Groups also practiced stopping and the role of the second volunteer as the blocker.

Questionnaire Results

Eleven of the 19 volunteers who received the early season questionnaire responded. The tenure of these volunteers ranged between one and thirteen years. One volunteer had been with the program for one year, five volunteers had been with the program between two and five years, four had volunteered between nine and 11 years, and one had been with the program for 13 years. Of the volunteers surveyed, 81% had previously worked with students using waist tethers.

When asked to describe why they chose to volunteer for Eagle Mount's multi-week snowsports program, 45% replied with statements of joy, fun, smiles, and good times. Another 45% of the comments included helping or supporting others and community service. Volunteers were asked to list two things that excited them about coaching students on waist tethers. Answers highlighting growth and independence made up 64% of the replies, and 18% referenced skiing; to share the love of skiing and ski better. One responded that the student they coach is great. A volunteer who has been with the program for 13 years responded with "more access."

When asked to list two things they might be apprehensive about when coaching students on waist tethers, 64% expressed dependency or default on the tool. When asked why eagle mount uses waist tethers, 27% said they consider it a mechanism used within a progression to "facilitate [a] safe transition to independent skiing," while 73% referenced safety and inclusion. One response stated, "safety, for some students it's the best way to keep them under control." Another said, "safety of students. Give students the enjoyment of skiing down longer slopes." Volunteers were also asked what Eagle Mount's goal was for using waist tethers. Responses from 45% of the volunteers indicated that the goal is to move away from them and encourage independence. One volunteer stated that the goal was to "get folks out skiing whether they ever ski independently or not."

When asked to list two characteristics of the teaching cycle, 64% replied with answers that directly reflected a familiarity with the Teaching/ Learning Cycle. Trust, encouragement, progression, and kinesthetic were a few words used to identify this. There was less familiarity with the three basic movements the human body can make; 55% responded that there are four-movement patterns the human body can produce. When asked how often fundamental skiing skills were considered when coaching, 27% replied frequently, 55% replied occasionally, one

replied not at all, and one did not respond (Figure 12). The volunteer who replied “not at all” also stated that tethers are to “get folks out skiing whether they ever ski independently or not.”

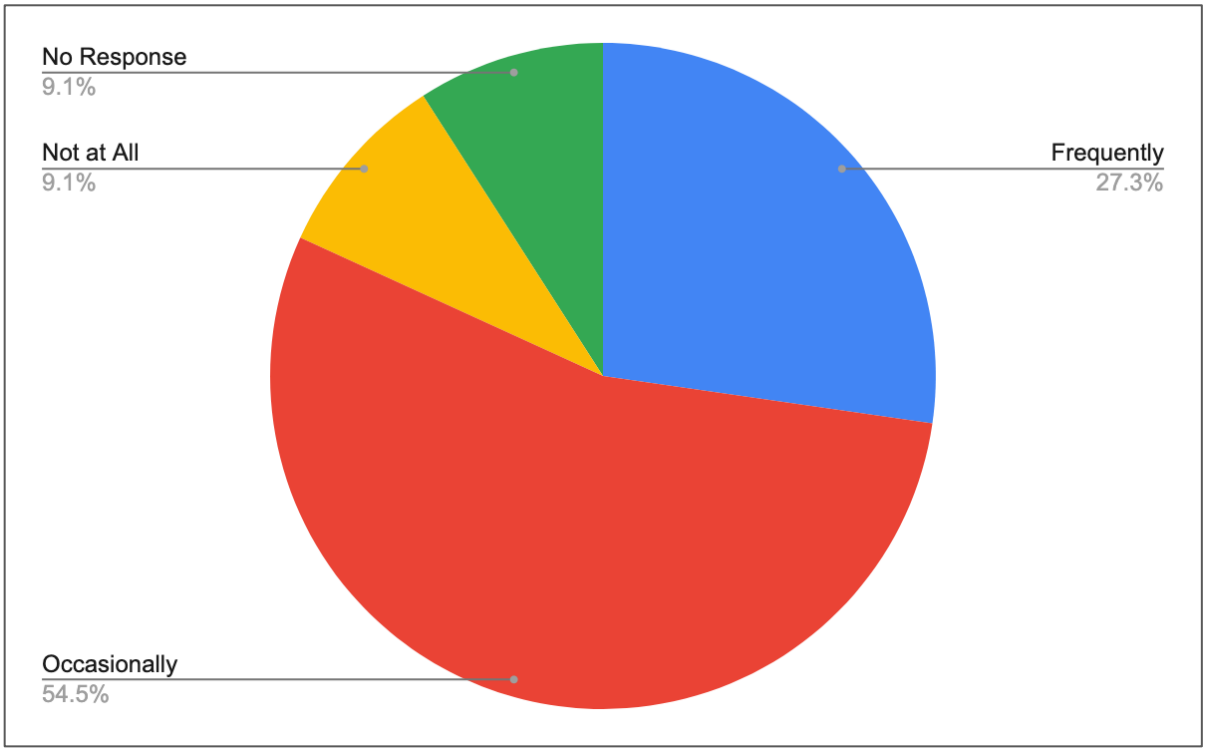

Figure 12. Percentages of how often surveyed volunteers consider the fundamental ski skills, (*N*=11).

Volunteers were asked to describe one thing they learned that would impact their lesson this season and help students make gains toward independent skiing; 91% of the responses referred to characteristics of the Learning Connection or gave examples from tether training. One answer said, “Stay safe and have fun." "Anyone can ski,” another replied, “focus on knowing the student.” A third stated, “tethers have a place, but they can quickly introduce restrictions onto students without us realizing it. Independence is far more important than skiing a steeper run.”

When volunteers were asked what coaching tool they anticipate using to promote fun and joy in their lessons, 100% of those who responded referred to elements of the Learning

Connection (*n*=9); 88% noted safety, fun, and learning and one cited the technical aspect of how edging and wedging can lead to independence.

The postseason questionnaire had a 26% return rate (*N*=5). When asked to identify one success and one thing that could have gone better, 40% were excited that they were able to move away from tethers, and 40% stated that they enjoyed seeing their student having fun on tethers. When asked what one thing that they learned in preseason training that they used throughout the season was, 80% described elements of the Teaching/ Learning Cycle. One volunteer stated, "evaluating students from first sight: physical limitations (how they move on [their] own), mental abilities (are they listening, understanding, obeying instructions), etc. Figure as much out prior to getting on snow." Another stated, "[played] games to explore range of motion to figure out how to help [the] student turn."

Over 80% of volunteers saw value in working with the same student throughout the program. Responses included building a relationship and developing strategies to best coach the student. When asked about using visual, auditory, and kinesthetic cues during the lessons, the volunteers reported having minimal responsiveness using visual and auditory cues. They found the students were the most responsive to kinesthetic cues (Figure 13).

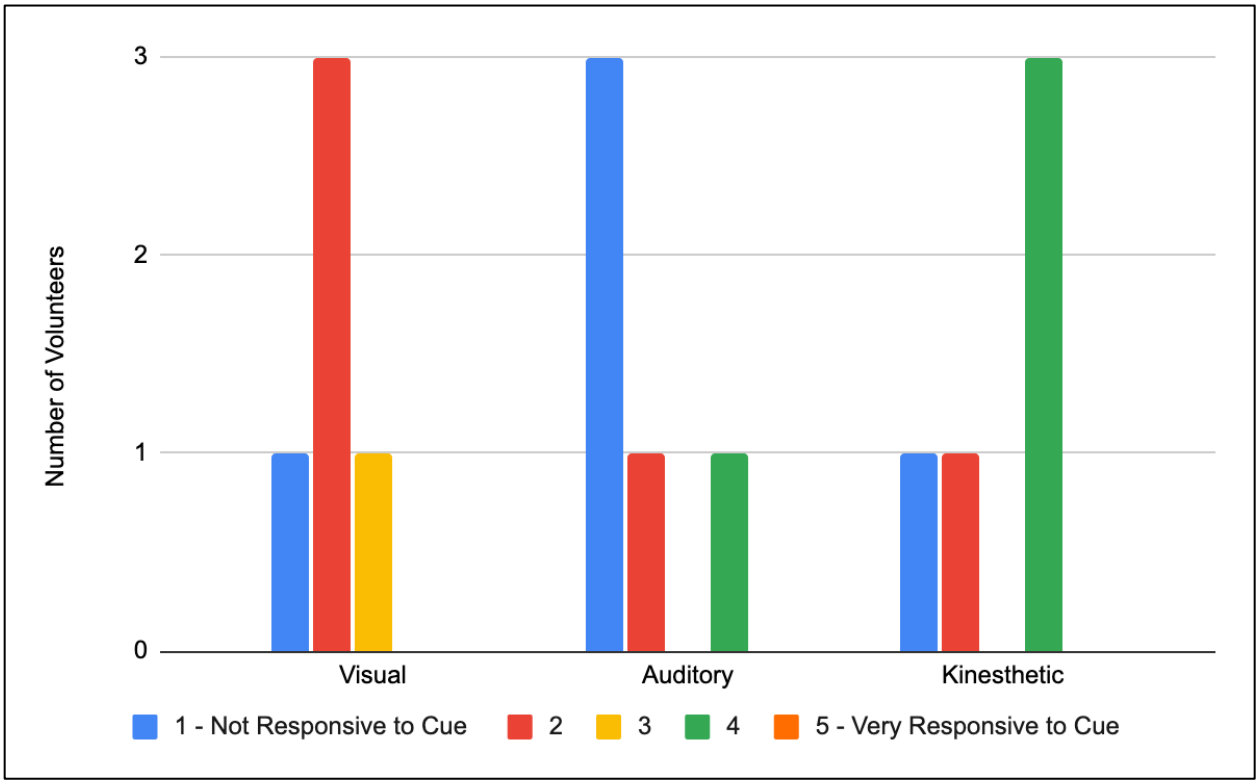

Figure 13. Volunteer use of visual, auditory, and kinesthetic cues to promote learning, (*N*=5).

Student Stories & Lesson Observations

Student 1 (S1) began working with Eagle Mount in 2015. He started skiing with the assistance of a slider device; between 2017 and 2020, he transitioned to waist tethers paired with tip-connectors and went back and forth between using the two. At the beginning of 2020, progress notes indicate that the slider was no longer needed, and by the end of the season, he fully transitioned to using a waist harness. S1 did not participate in 2021 and transitioned to tip-tethers this season. S1's goal for his experience at Eagle Mount was to "get to know more people." S1enjoys video games and computers.

S1 enjoyed his time at Eagle Mount and has befriended many of the staff and returning volunteers, including the volunteer (V1) he worked with this year. S1 had loads of fun in the locker room and on the chairlift, but it was unclear if he enjoyed sliding down the hill.

During the two lessons observed, V1 used one drill on two different runs to encourage S1 to make small radius turns down beginner terrain. V1 learned that S1 had difficulty negotiating right from left and attached colored tape to his gloves to promote a visual cue that prompted him to “push on the ski” below the color he called out. The auditory cue of calling out the turn caused the student to look down at the glove with the colored tape on it. The visual cue may have helped him anticipate which way the volunteer would be turning his skis and move a little bit of his body weight over the turning edge by looking down at it. Ultimately, the volunteer was responsible for pivoting the skis under the student's body to turn. The fundamental ski skills required for the student to become familiar with the kinesthetics of initiating a turn were not introduced leading up to this point. The volunteer did not create games or activities engaging for S1 or explore other methods to encourage turning.

S1 had an athletic stance over his skis, though he was not quite forward enough to initiate a turn. He was beginning to move slightly over the ski edges by moving his upper body toward the inside of the turn when V1 used the tip tethers to initiate his turn. The following chart highlights the observed technical skiing skills S1 was working on and where he was at the end of the program (Table 4).

Table 4. S1’s technical skill analysis.

Skill	**Fundamental**	**Present?**
Pressure Control	Control the relationship of the center of mass to the base of support to direct pressure along the length of the ski.	Working on it – not forward enough yet

Pressure Control	Control pressure from ski to ski and direct pressure toward the outside of the ski.	Working on it
Pressure Control	Regulate the magnitude of pressure created through ski/snow interaction.	Working on it
Edge Control	Control edge angles through a combination of inclination and angulation.	No
Rotational Control	Control the skis' rotation with leg rotation, separate from the upper body.	No

Student two (S2) is nonverbal and communicates using his iPad when asked. He is also familiar with choosing between two decisions when given the options in the form of the left hand indicating one decision and the right hand showing the other; he is highly receptive and responds well to being given choices. S2 began working with Eagle Mount in 2019. His experience at Eagle Mount started with the use of waist tethers. S2's goal and reason for joining Eagle Mount this year were to "have fun and improve his skiing level." S2 loves Lightning McQueen.

On most flat ground and basic beginner terrain, S2 can mimic the movement of others' skis and move around on his own. During the first lesson, V2 allowed S2 to take three straight runs down the beginner berm, or Whale Tail. Following this, V2 paused for a bit and appeared to watch others. He pointed to the magic carpet, so V2 took him there. One-third of the way up, S2 sat down and was not willing to continue up. After a break, he tried again. S2 needed to be held up on either side to reach the top. Here he sat on the bench and appeared to be observing other skiers. V2 quickly got him up and skied backward, directing him down the hill. S2 seems to be content going slow and taking breaks to watch people. S2 is captivated by the people all over the hill. This suggests an excellent opportunity to progress slowly, at his pace, after he has had

plenty of time to watch others do it and know it is safe. These characteristics indicate a visual preference for learning.

During his lessons, S2 would often sit or lay down and preferred not to continue skiing. This action was witnessed in various settings and when he was introduced to new challenges, such as ascending the magic carpet or descending a slope for the first time. V2 did not check in with S2 to learn about the cause of this action. It appeared that S2's sit-down response was a reaction to being scared and possibly going too fast while directed down the hill. V2's objective was to keep him skiing and had little tolerance for much in between. Games and thoughtfully curated progressions were not part of V2's coaching technique.

In the second lesson, S2 showed interest in ascending the beginner lift. He was comfortable loading but appeared nervous as the time to unload approached. He stiffened up and leaned back, making it hard to descend the ramp. After unloading, he made his way to the bench. V2 would get S2 up from the bench and support him down the hill using a bamboo pole. Supporting him in this way did encourage the student to lean forward as he reached for the pole V2 was holding, but there was little bend in his knees and limited body movement to promote turn initiation. V2 steered S2's skis using the tips of his skis. The following chart highlights the observed technical skiing skills S2 was working on and where he was at the end of the program (Table 5).

Table 5. S2's technical skill analysis.

Skill	**Fundamental**	**Present?**
Pressure Control	Control the relationship of the center of mass to the base of support to direct pressure along the length of the ski.	Working on it

Pressure Control	Control pressure from ski to ski and direct pressure toward the outside of the ski.	No
Pressure Control	Regulate the magnitude of pressure created through ski/snow interaction.	No
Edge Control	Control edge angles through a combination of inclination and angulation.	No
Rotational Control	Control the skis' rotation with leg rotation, separate from the upper body.	No

Student three (S3) is nonverbal and communicates using her iPad and story cards. S3's goals for the Eagle Mount ski program were "to make friends, get some exercise, and get vitamin D from the sun." S3 began working with Eagle Mount in 2010. Her experience at Eagle Mount has always been with the support of waist tethers, and there is currently no plan to remove them. S3 loves music and singing and is happiest away from the hustle and bustle of everyone else.

During my observations, it was clear that S3's arrival routine is very dialed, and she is very comfortable with it. S3 is most content when external stimulation is limited, so she has a designated room to gear up, and when ready, she and her volunteer headed straight for the lift and tried to avoid crowds on the way. S3 can independently load and unload the chairlift.

S3 and her volunteer sang on the chairlift, typically "You Are My Sunshine" or "Take Me Out to the Ball Game." On one occasion, she continued to clap and sing all the way down the hill. During both observations, S3 indicated that she was finished after one run. When S3 was done skiing, she would lay on the ground and bang her head on the snow until she was allowed to return to the hut. Her volunteers always gave her the option to ski more.

S3 is very stable on her skis. She maintains an athletic stance and looks where she is going. Her stance allows her to control the relationship of the center of mass to the base of support to direct pressure along the length of the ski. She can apply basic pressuring moves to begin controlling her skis, though she does not assert enough intensity to complete a turn. Based on her form, it is possible that the other two pressure control skills could be learned. Still, there is hesitation that these do not align with her goals and could be challenging to alter the muscle memory she has developed over the last 11 years on waist tethers and put her in an overstimulating environment. The following chart highlights the technical skiing skills S3 was working on and where she was at the end of the program (Table 6).

Table 6. S3's technical skill analysis.

Skill	**Fundamental**	**Present?**
Pressure Control	Control the relationship of the center of mass to the base of support to direct pressure along the length of the ski.	Yes
Pressure Control	Control pressure from ski to ski and direct pressure toward the outside of the ski.	Working on it

Pressure Control	Regulate the magnitude of pressure created through ski/snow interaction.	Working on it
Edge Control	Control edge angles through a combination of inclination and angulation.	No
Rotational Control	Control the skis' rotation with leg rotation, separate from the upper body.	No

CHAPTER FIVE

CLAIMS, EVIDENCE, REASONING

Claims From the Study

Eagle Mount relied on PSIA models to guide its program preparation and volunteer training for the 2022 ski season. They emphasized safety and fun to encourage learning and prioritized student engagement and autonomy. Student assessment began long before the program and resulted in a decreased number of students using waist tethers at the beginning of 2022. In 2020, 44 students began the season with waist tethers. In 2021, 11 students used waist tethers, and in 2022, 12 students used waist tethers. This year's result was nearly a 75% decrease in students who signed up to use waist tethers at the beginning of the 2022 multiweek program and last year was even higher.

The decrease in waist-tethered students suggests the new skills Eagle Mount staff employed during their initial assessment conversations with students and their caregivers led to an understanding of the students' needs in relation to the CAMP model. This allowed them to collaborate on program goals based on student interest and motivation. These discussions likely increased trust in making a shift away from waist tethers and outlined a progression for the students' success without them.

Preseason New Volunteer Training continued to follow the Learning Connection model and the Teaching/ Learning Cycle. Eagle Mount staff provided learning opportunities for new volunteers that focused on student-centered coaching techniques and progressions for success. The training addressed the importance of getting to know a student and understanding their goals and motivations, as well as the five fundamental skills of alpine skiing. Training also provided

opportunities to explore tools and techniques that focused on fun while promoting independence in a safe environment. This is evident from preseason training observations, Early Season Questionnaire results that often echoed the desired training outcomes, and from the decreased number of students using waist tethers at the beginning and end of the season.

When the program kicked off in January 2022, 12 students utilized waist tethers. Eight weeks later, six students were independent of tethers or any physical assistance, one student was using a bamboo pole for guidance, one transitioned to tip tethers and four were using waist tethers part-time or as needed. This decrease suggests the shift in volunteer training positively impacted student autonomy. This may be a result of the early season webinars and PSIA e-learning modules that introduced the people skills essential for working with adaptive students and techniques to provide a successful beginner experience. These opportunities primed the information that would be communicated during on-snow training.

On-snow training addressed the fundamentals of alpine skiing and provided opportunities to create games and activities supporting independent progressions were included in all observed volunteer training. Practice scenarios encouraged volunteers to explore teaching techniques utilizing visual, kinesthetic, and auditory cues, craft progressions focusing on student goals, and plan engaging experiences promoting autonomy. Safety and fun were heavily emphasized.

The successes in independence that were witnessed by the leadership team imply that the shift in the training focus was embraced and utilized. Six of the students who had previously been on waist tethers and chose to go without them this year spent the majority of their time on beginner terrain, some never ascending any type of lift. Shifting from the historic mentality of dragging people around on ropes, these teams played outside with skis on their feet and absolutely loved it!

Conversely, two of the student lessons I observed, focused strictly on getting the student to turn, despite that not being their goal. Their volunteers took them to terrain that was not manageable on their own and games and play were not the focus. These volunteers displayed the historical mentality, focusing on the operational side of skiing, not on how to relate to the student in a way that engaged them. They did not apply the beginner progression to introduce fundamentals that would prepare their student to make turns in the future. It appeared that this approach caused some hesitation about the pursuit of skiing that hindered student progression toward independence.

Having just come off waist tethers, S1 and S2 needed an introduction to the beginner progression and a learning experience that taught them to manage their skis on their own. Reviewing the student's progress notes from past seasons, it appeared that this experience was never fully introduced, and as such their only base of knowledge was to rely on their volunteer for support. Exploring the fundamentals through a beginner progression may have also given the volunteers the opportunity to understand what learning styles and what visual, auditory, and kinesthetic cues worked best for their students. It was observed that S2 could watch a person's skis move and mimic that action. However, V2 never picked up on this and continued to take him to terrain that required his support.

Volunteers who were motivated to spend time learning to communicate with, and understand what brought joy to the students, tended to be newer volunteers who embraced the concepts that were promoted during preseason training. Volunteers who focused on the operational side of skiing had been with the program for more than five years. Unlike new volunteers, returning volunteers were not required to attend preseason training that highlighted the Learning Connection and the Teaching/ Learning Cycle that put emphasis on student joy and

independence. This suggests the shift in training focus does impact volunteer creativity and introduces techniques that impact student autonomy. Students playing in beginner terrain did not require physical assistance because they were never introduced to a situation that was outside of their comfort zone or above their ability. Students who were taken out of their comfort zone to accomplish the act of turning their skis did not make visible gains toward independence and needed the volunteer to support them to make it safely down the hill.

The success of the students described by the Eagle Mount staff shed light on the patience and creativity it requires to move slowly through logical progressions that increase confidence and encourage fun. It is easy to equate success with moving farther up the hill and checking off boxes next to a skill, but this is not the goal of every skier. This reinforces the idea that a volunteer's coaching technique impacts a student's ability to make gains towards autonomy.

It is unclear if waist tethers inhibit or promote student independence. With limited opportunities to witness the use of these devices, the focus of this study shifted to examining training practices and coaching techniques that foster student autonomy. The data collected suggest that these elements inspire student-centered experiences that impact student autonomy. Tethers are simply a tool that, if used correctly, can be employed to progress in that direction.

Value of the Study and Considerations for Future Research

This study intended to help Eagle Mount identify where progress was being made to shift the culture from taking everyone skiing all the time to creating a relationship around skiing that genuinely focused on the student having fun and enjoying a recreational experience outdoors.

Knowing what gaps remain could be valuable in outlining future training structures and content and influence a united front regarding student-centered experiences. For most people, skiing is fun because of the social aspect of engaging with others, laughing, sharing memories or experiences, and exploring new things. There is value in acknowledging that everyone's goals are different and that assumptions should not be made about what students should accomplish in their pursuits. Everyone’s journey is different, even if their goals look similar.

Reflecting on the 2022 season, it would be interesting to observe and compare two beginner students that are new to the program and their volunteers; placing one student with a volunteer who has five years of experience or more and one with a volunteer who has two years of experience or less and following them throughout the season. Likewise, understanding what training opportunities, if any, volunteers with five years of experience or more participated in and why would be valuable. These scenarios would provide additional insight and further identify key differences in their approach to the Teaching/ Learning Cycle and the experience they create around the beginner progression.

It would also be interesting to track Eagle Mount students who enter the ski program at a young age and understand if or how their experience at the ski hill influences other aspects of their life. Does it build confidence or social skills? Do they stay healthier than their counterparts who may not have the opportunity to get outside? Do they do better in school because of this experience? Or is it fun while it lasts, and then they go back to everyday life? These questions are interesting to ponder and do not need to be limited to any demographic.

Focused more specifically on the adaptive community, learning how live recreation experiences compare to virtual reality (VR) experiences. Do they foster the same sense of joy? Is there a way to compare the possible benefits of the two? As VR experiences become more

mainstream and readily available, there are more and more accounts of them are being used to promote a similar experience. But do they really compare, and how can this be assessed?

Impact of Action Research on the Author

Introduction to the action research process shed light on my ability to go beyond just pondering questions and making assumptions about the answer. It encouraged me to ask how a question could be answered. I learned to explore previous research and techniques, discover what can be gained, and by whom, to find the answer. It is inspiring to understand the steps required to conduct action research thoughtfully.

Reflecting on the process and outcome of my action research may have been the most valuable aspect of this project. Looking back at the changes that had to be made due to unforeseen circumstances, and reflecting on the data collection methods was very impactful. I could have collected more focused data that answered the original focus question if everything had gone as planned but having to pivot created an opportunity to focus more on the big picture versus one small aspect of the learning environment. Identifying what could have been done differently during the action research process has prepared me to approach action research with more experience in the future.

Efficiently collecting focused data can help understand individual perspectives and thoughtfully guide progression, just like coaching skiing. I believe this experience will continue to influence my teaching and provide information that can be used immediately and provide the best learning outcome for those involved. The benefit of action research to me and the most local learning environment is limitless.

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APPENDICES

APPENDIX A

IRB EXEMPTION

Dear Jaime,

Thank you for your application. This email acknowledges receipt of the request for IRB Review and serves as the Approval Letter for your research. Your new **IRB Exempt Protocol # is JA012122-EX**.

Study Title: **Eagle Mounts Use of Waist Tethers in Adaptive Skiing**

As the PI, it is your responsibility to facilitate subject understanding by informing subjects of all aspects of the project, providing an opportunity to ask questions, and describing risks and benefits of participation. Submit any new changes to the research protocol to the IRB via Amendment Form prior to implementing.

The research described in your submission is exempt from the requirement of additional review by the Institutional Review Board in accordance with 45 CFR 690.104(d). The specific paragraph which applies to your research is:

(2) Research that only includes interactions involving educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior (including visual or auditory recording) if at least one of the following criteria is met:

(i) The information obtained is recorded by the investigator in such a manner that the identity of the human subjects cannot readily be ascertained, directly or through identifiers linked to the subjects;

(ii) Any disclosure of the human subjects' responses outside the research would not reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, educational advancement, or reputation; or

(iii) The information obtained is recorded by the investigator in such a manner that the identity of the human subjects can readily be ascertained, directly or through identifiers linked to the subjects, and an IRB conducts a limited IRB review to make the determination required by § 690.111(a)(7).

APPENDIX B

PRESEASON PROGRAM LEAD INTERVIEWS

1. What is tethering?

2. In your program, who uses it?

3. How does it support students?

4. How does it hinder students?

5. What is the ultimate goal for students using tethers?
    a. Is there research that has led to this decision?
    b. What objective have you outlined for reaching this goal?

6. Can you elaborate on the culture shift you would like to see revolving around tethers?

7. Is it true that you have redesigned the 2021/2022 tether training modules to motivate the changes you wish to see in instruction techniques?

8. How have you redesigned tethering training to promote the culture shift you desire?

9. Regarding new and returning volunteers, do you foresee ways in which they may help or hinder the goals of the culture shift that you are striving for?
    a. What is the rationale of those who may wish to maintain the status quo?

10. What else should be known about tethering devices or the students that use them at Eagle Mount?

APPENDIX C

WAIST TETHER VOLUNTEER EARLY SEASON QUESTIONNAIRE

Thank you for completing this questionnaire. Your responses are voluntary and anonymous.

The information collected in this questionnaire will support data collection efforts contributing to an MSU graduate study investigating the use of stand-up waist tethers in Eagle Mount's Eight Week Snowsports Program at Bridger Bowl.

Thank you for your participation!

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1. How long have you volunteered with Eagle Mount? Please circle:
   2-5 years 6-8 years
   9-11 years 12 years
   Other (add years >12) _____
2. Have you volunteered with students using waist tethers in the past?
   Yes No
3. In five words or less, please describe why you chose to volunteer for the Eagle Mount Snowsports Program:
4. List two things that excite you about supporting Eagle Mount Snow Sports waist tethered students this season:
   i.
   ii.
5. List two things that you might be apprehensive about coaching students on waist tethers:
   i.
   ii.
6. Why does Eagle Mount use waist tethers in their programming?
7. What is Eagle Mount’s goal for the use of waist tethers?
8. Can you list two characteristics of the Teaching Cycle that you incorporate into your lessons?
   i.
   ii.
9. How many movement patterns can the human body make? Please circle:
   1 2 3 4

10. I consider the fundamental ski skills (Rotation, Edging, and Pressure) when coaching someone on a tethering lesson? Please circle how often:

Frequently	Occasionally
Not at all	I have never heard of this

11. What is one thing you took away from preseason training that will impact your lessons this season and allow your student to make gains toward more independent skiing?

12. What coaching tools do you anticipate using to promote fun and joy in your multi-week lessons?

13. Is there anything else you wish to share?

APPENDIX D

WAIST TETHER VOLUNTEER POSTSEASON QUESTIONNAIRE

Thank you for completing this questionnaire. Your responses are voluntary and anonymous.

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Thank you for your participation!

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1. Can you reflect on one rose (a success) and one thorn (something that could have gone better) that sticks out from this season?
    a. Rose:

    b. Thorn:

2. What is one thing that you learned in pre-season training that you used throughout the season to make gains towards more independent skiing?

3. What is the value of working with the same student in a multi-week program all season? Check all that apply:
    a. Building a relationship with the student
    b. Watching the student gain confidence in their skill ability
    c. Watching the student interact with others
    d. Seeing people having FUN!
    e. Watching the student gain independence in their ability to navigate the terrain
    f. Helping the student recognize kinesthetic cues that enhance their ability to control their device
    g. Defining auditory cues that aid in efficient movement patterns
    h. Developing visual cues to guide the student safely
    i. Developing strategies to best communicate with your student
    j. Helping the student recognize kinesthetic cues that enhance their ability to control their device
    k. Defining auditory cues that aid in efficient movement patterns
    l. Developing visual cues to guide the student safely
    m. Finding creative ways to promote safety, fun, and learning
    n. I did not see the value in working with one student over several weeks

4. What visual cues did you employ during lessons?

5. On a scale of 1 to 5, how responsive was the student to visual cues when receiving information?

Not at all responsive 1 2 3 4 5 Very Responsive

6. What auditory cues did you employ during lessons?

7. On a scale of 1 to 5, how responsive was the student to auditory cues when receiving information?
   Not at all responsive 1 2 3 4 5 Very Responsive

8. What kinesthetic cues did you employ during lessons?

9. On a scale of 1 to 5, how responsive was the student to auditory cues when receiving information?
   Not at all responsive 1 2 3 4 5 Very Responsive

10. Do you think there are any disadvantages to working with one individual over several weeks? Circle: Yes or No
    Please explain your response:

11. How did the Tether Plan influence your lessons?

12. What was the most useful coaching technique(s) you employed this season?

13. What was the biggest change your student made this season in their ability to navigate terrain?

14. What was the biggest influence on your students' progression this season?

15. Do you think your student successfully met their outlined goal this season?
    Circle: Yes or No
    Please explain your response:

16. Looking back, is there something you wish you had learned in training that came up later in the season? Circle: Yes or No
    Please explain your response:

17. Please elaborate on the experience you had with your co-instructor?

18. Is there anything else you wish to share?

APPENDIX E

POSTSEASON INTERVIEW WITH VOLUNTEER

1. What goals did you set to accomplish this season?
    a. How did that go?

2. What was the best part about this season?

3. Is there anything that you would change about this season?

4. If you had to pick one word to describe your experience this year, what would it be?

5. What else do you want to share?
6. Was your student familiar with tethers/ had they used them before?

1. For how many years has your student been using tethers?

2. Did your student become independent of tethers during the course of the season?
    a. If so, how did you influence this? What strategies were employed?
    b. If not, do you foresee the student moving away from tethers in the future?
        i. Can you elaborate on why the student is not likely to become independent of tethers?

3. Did your student best respond to audio, visual, kinesthetic cues, or a mix?
    a. How did you determine this?

4. What was the most valuable technique you employed to facilitate student-centered coaching?

5. What goals did you set to accomplish this season?

APPENDIX F

OBSERVATION JOURNAL

- Weather & conditions
- Equipment & fit
- Attitude about that day's lesson
- Goals for each lesson
- Volunteer strategies for success
- "AH-HA" moments
- Physical implications for maneuvering sliding devices & observed changes from the previous lesson (regarding PSIA Five Fundamentals of Alpine Skiing)

Skill	**Fundamental**	**Present?**
Pressure Control	Control the relationship of the center of mass to the base of support to direct pressure along the length of the ski.	
Pressure Control	Control pressure from ski to ski and direct pressure toward the outside of the ski.	
Edge Control	Control edge angles through a combination of inclination and angulation.	
Rotational Control	Control the skis' rotation with leg rotation, separate from the upper body.	
Pressure Control	Regulate the magnitude of pressure created through ski/snow interaction.	