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Hope on the Slopes: Occupational Therapy’s Role in Adaptive Ski Programming

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OT 7202 - Capstone Experience & Project

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Abstract

Adaptive skiing and Occupational Therapy (OT) have potential to merge well together. They both aim to enable individuals, regardless of ability, to engage in a purposeful activity or occupation through providing the appropriate supports or interventions (Lundberg et al., 2021; AOTA, 2020). Although OT is acknowledged as a service delivered in community-based settings (AOTA, 2020), there is limited evidence to support a collaboration between OT and its involvement in community-based adaptive ski programing. The purpose of this Doctoral Capstone Experience (DCE) is to explore the role of OT in a community-based adaptive ski program, Challenge Mountain. Through serving alongside the Program Director, facilitating programs, implementing theory to guide decision making, and interacting with participants, it became clear that a collaboration can add value to not only Challenge Mountain as an organization, but also the field of OT. Most importantly, the DCE revealed that self-determination is enhanced when individuals with disabilities are provided an opportunity to choose a novel or challenging activity coupled with the applicable supports, as recommended by theoretical principles such as Self Determination Theory (SDT), Ecology of Human Performance (EHP) model and Social Cognition frame of reference (Dunn et al., 1994; Cole & Tufano, 2020).

Introduction to Capstone Project

Challenge Mountain is a non-profit organization located in Boyne Falls, MI that provides year-round recreational programs for people with disabilities and their families (“Home”, n.d.). In 1984, Challenge Mountain was formed after owner of Boyne Resorts, Everett Kircher, donated Walloon Hills Ski Area to help a mother of a daughter with a disability fulfill her dream of establishing an adaptive ski program for people with similar abilities (“History,” n.d.). Funded by the sales of the Challenge Mountain Resale Store in 1986, the first adaptive ski program in Northern Michigan began in 1990 and has expanded and offered its programs to the community ever since (“History,” n.d.).
During the DCE, involvement with the adaptive ski program took place alongside the site mentor and Program Director, Linda Armstrong. Linda is a Recreational Therapist with a vast array of experience working with people with disabilities in the clinical setting, outdoor recreational setting, and the arts. Although the concentrated Accreditation Council of Occupational Therapy Education (ACOTE) area was program development, OT theory was incorporated to help cultivate the program. The populations served included school groups with special education students, community groups, and individual and families. Services were provided to areas of Northern Michigan including Emmet, Charlevoix, and Antrim counties, as well as areas outside of Northern Michigan including Metro-Detroit area, Fort Wayne, IN, Chicago, IL, and Cincinnati, OH. In summary, 353 individual experiences were provided during the 24 adaptive ski programs from January – end of March.

**Literature Review**

The benefits of participating in adaptive sports are multifaceted (Lape et al., 2018). Limited research exists, however, of the advantages of partaking in an adaptive ski program for people with disabilities. Additionally, there is scant research about OT’s role in community-based programs for adaptive skiing. The purpose of this literature review is to analyze the benefits, barriers, and potential for OT involvement in an adaptive ski program for persons with disabilities.

**What is Adaptive Skiing?**

Originating in post-World War II Europe, adaptive skiing was coined by an Austrian ski instructor, Frank Wendel, who attached skis to a pair of crutches to allow veterans with physical disabilities to access the mountain (Renick, 2019). The sport was adopted in the United States in 1967 and programs have sprouted across the country ever since (Renick, 2019). Adaptive skiing refers to any modification to alpine skiing equipment so that persons with disabilities can participate in a seated or standing position using hand-held outriggers instead of ski poles (Lundberg et. al, 2021; Juriga et al., 2018). Adaptive ski equipment can further be classified as having a customized or prefabricated bucket seat (sit-ski)
attached to either two skis (bi-ski) or one ski (mono-ski) and have an option to be affixed to a ski guide who uses tethers to control the turn of the skis (Juriga et al., 2018). Sit-ski users can present with diagnoses such as bilateral lower extremity amputations, spina bifida, spinal cord injury, traumatic brain injury, muscular dystrophy, cerebral palsy, multiple sclerosis, severe epilepsy, and severe balance impairment (Juriga et al., 2018). There are also options for people who are ambulatory, visually compromised, or single-extremity amputee to use a three-track or four-track method, which provides two hand-held outriggers affixed to either a mono-ski, bi-ski, or pair of downhill skis (Juriga et al., 2018). Knowing the history and types of adaptive ski equipment and their intended purposes are important to consider for the logistics of an adaptive ski program.

**Psychosocial Benefits**

As mentioned, there are numerous benefits to participating in adaptive sports. The literature suggests several psychosocial benefits for individuals with disabilities who partook in adaptive skiing. A study by Lundberg et al., qualitatively analyzed how individuals felt after completing an adaptive ski program and reported feelings of acceptance, purpose, normalcy, freedom, accomplishment, and equal opportunity with able-bodied peers (2021). Similarly, another qualitative study found that individuals experienced community, enjoyment, novelty, success, and a sense of identity (Mavritsakis et al., 2021). Furthermore, an unexpected outcome from volunteers of an adaptive ski program reported that participants acquired a stronger bond with their families to share an activity they can do together (Sanders & Malcanoff, 2021). Additionally, a quantitative study found similar outcomes with participants with acute injuries who reported higher self-esteem and a more positive self-concept from participating in frequent adaptive skiing versus individuals who did not (Suc et al., 2015). The results of these studies elucidate a need for a mixed-method study to combine both the perceived lived-in experience of participating in an adaptive ski program while capturing participant reported outcomes.
Improved Quality of Life

In addition to the reported psychosocial benefits of participation, the literature also suggested that adaptive ski programming has helped improve overall quality of life. Through an observational study of people with a spinal cord injury who used a mono-ski, participants reported less fear of falling, higher satisfaction with their physical and psychological health, and increased performance of daily living activities (Adriano et al., 2020). There was no control group, however, to compare the differences between individuals who did not engage in adaptive skiing (Adriano et al., 2020). The results also indicated a need for more training on transfers to sit-skis and a protocol for strengthening upper extremities to increase balance while skiing (Adriano et al., 2020). Another article highlighted an adult with Multiple Sclerosis who relied on adaptive sports such as skiing to cope with her progressive illness and improve her overall quality of life (Doyle, 2014). These studies further reveal how adaptive skiing can help foster a more positive outlook on life for people with disabilities.

Physical Health Benefits

Along with the advantages of adaptive skiing on ones’ psyche, there is supporting evidence of its potential to improve the physical health of individuals with disabilities. Previous research has suggested that persons with intellectual and physical disabilities experience a higher likelihood of living a sedentary lifestyle (Degache et al., 2019). A descriptive study by Degache et al. compared biological health markers of children with profound intellectual and multiple disabilities (PIMDs) versus typically developed (TD) children after completing a 12-turn ski run (2019). The authors found that the children with PIMDs provoked similar postural adaptations and increased heart rate compared to their TD peers, thus suggesting that sit-skiing has rehabilitative potential for individuals with disabilities (Degache et al., 2019).

Additionally, a study by Sterba examined the gross motor function of children with cerebral palsy (CP) after completing either a 30 min/week or 90 min/week Adaptive Downhill Skiing Therapy
(ADST) for 10 weeks (2004). It was suggested that the group who received 90 min of ADST per week improved their gross motor function score at every increment (5 weeks, 10 weeks, and 5 weeks post program) compared to the group receiving 30 min of ADST per week (Sterba, 2004). This study sheds light on how a higher frequency of adaptive skiing may lead to increased gross motor functioning for children with CP. Another study revealed that adolescents with limb-deficiencies who completed a 6-day adaptive ski program improved their coordination of movement, maneuverability of skis, and reported higher levels of self-mastery (Pasek & Schkade, 1996). The literature supports that adaptive skiing could produce improvements in physical health for individuals with variable disabilities.

**OT Definition and Scope of Practice**

Occupational Therapy can be described as an inclusive, holistic, client-centered, occupation-focused, and science-driven profession (AOTA, 2007). Practitioners use occupations or meaningful daily activities to promote engagement in preferred activities or enhance performance in a target area or client factor (AOTA, 2020). Historically, the profession has shifted from an arts and crafts movement to a medical-based model, to currently, an occupation-centered practice (Cole & Tufano, 2020). The diverse nature of OT permits practitioners to deliver services in a variety of settings. Since OT practitioners understand the dynamic relationship between clients, caregivers, family members, and community stakeholders (AOTA, 2020), a community-based service delivery model is a scope of practice to be considered.

**Theoretical Implications**

Through implementing theoretical principles such as the Ecology of Human Performance (EHP) model (Dunn et al., 1994), Social Cognitive frame of reference (Cole & Tufano, 2020), and Self Determination Theory (SDT) (Trigueros et al., 2019), OTs are positioned to add evidence-based value to community programs. The EHP model acknowledges the transactional relationship between a person's
environment and personal factors (Dunn et al., 1994). Furthermore, Cole & Tufano suggest that an individual’s autonomy is enhanced when their environment supports their unique characteristics, which then leads to optimal performance in their chosen tasks (2020).

Similarly, the Social Cognition frame of reference highlights concepts within SDT, which suggest that people develop autonomous motivation to perform and achieve wellbeing when they are nourished by three basic psychological needs: autonomy, competence, and relatedness (Brown, 2011); (Trigueros et al., 2019).

Cole & Tufano (2020) describe these concepts as the following:

Competence is analogous to self-efficacy, which is reinforced by repeated experiences of successful engagement in occupations. Autonomy promotes the ability to make choices and set goals for oneself, a condition that must be supported by one’s physical and social environments that afford people the freedom to be self-determined. [...] [Lastly,] relatedness, or a state of belonging and connectedness to others, which renders needed support for the person’s self-directed choices (p. 221).

By fostering these three needs and using principles of the EHP model and Social Cognition frame of reference, OT practitioners have tools that can help promote engagement in a community-based adaptive ski program.

**Self-Determination Theory (SDT) in Sports**

In a study by Trigueros et al., the concepts of SDT were analyzed between athletes and their trainers (2019). The researchers hypothesized that the athletes would become more intrinsically motivated to perform if their trainers’ used principles from SDT such as encouraging autonomy or allowing athletes to experience volition (Trigueros et al., 2019, p. 2). Conversely, Trigueros et al suggested that a controlling coaching style would lead to increased frustration and dissatisfaction of their basic psychological needs (autonomy, competence, and relatedness) (2019, p. 4). Although the
researchers explored the concept of autonomy as suggested in SDT with able-bodied athletes, their findings suggested that an autonomy-promoting coaching style led to more satisfaction and fulfillment of their needs to facilitate self-determination (Trigueros et al., 2019). This study suggested that implementing SDT into a sports program such as a community-based adaptive ski program could lead to an enhanced performance of the individual.

Limitations
The literature presented several limitations that could be addressed for future research. Aside from the scant number of mixed-method studies, there was also an expressed need for more education and training on the assembly and fitting of adaptive equipment, increased diversity of participant demographics, and longer lengths of programming (Mavritsakis et al., 2021); (Pasek & Schkade, 1996). Additionally, the studies were conducted in a more urban and densely populated area, which creates a selection bias toward those regions. Therefore, individuals from more rural areas are underrepresented in the existing literature. Furthermore, there were limited studies that explored OT’s role in adaptive ski programs and the incorporation of theoretical principles to guide program development. Understanding the gaps from the literature will help inform prospective research and expand OT involvement in community-based adaptive ski programming.

Conclusion
In conclusion, engaging in adaptive skiing has been well represented in the literature. Specifically, the findings suggested that adaptive skiing has potential to improve the mental, physical, and relational health of individuals with disabilities. There are limited studies exploring the role of OT involvement in adaptive ski programming and the impact it could have on individuals with disabilities and the overall profession.
Needs Assessment

From the literature review and correspondence with the site mentor, there are a few occupation-based needs within the organization. First, since volunteers are the lifeblood of Challenge Mountain, it is important that volunteers felt heard and valued. To address this, weekly communication via email and texts were sent to volunteers so that they were always updated with programs and volunteer needs. A volunteer survey was also conducted at the end of the season to gather feedback from their experience.

Next, since Challenge Mountain is the only adaptive ski program in the community, it already fills a gap in the literature of providing an opportunity for people with disabilities to participate in adaptive recreation activities in a rural area. However, there are still challenges with reaching individuals through various media platforms, transportation difficulties, and accommodating individual lessons on off-program days. By consistently updating the calendar, using communication strategies across multiple media platforms (e.g., text, email, word of mouth, Facebook, Instagram, etc.), and conducting a survey to participants, the accessibility barrier was addressed and areas of improvement for future programming was considered.

Last, from observing and participating in strategic planning meetings, it became evident that there was a need to integrate evidence-based language into the organization to attract grant funders, individuals from the scientific/medical community, and provide more value behind the mission and vision of Challenge Mountain. Through exploring theoretical principles in OT and sports psychology, as shown in the literature review, language from these principles were synthesized and translated into layman terms to be included as a blog on the website.
Objectives Achieved during the Capstone

Objectives were created to help fulfill the needs of Challenge Mountain. To allow for expansion and modification as the DCE evolved, the objectives were written broadly. During the DCE, the following objectives were achieved: 1) By week 3, student will serve as primary assistant to program director and learn necessary skills to facilitate programs for individuals with disabilities. 2) By week 5, student will coordinate and facilitate event planning, scheduling, on-site instruction, and communication between participants and volunteers. 3) By week 14, student will interact and assist with individuals with disabilities and their families and establish relationships and partnerships with local community for program longevity.

Many learning activities were conducted to bring the objectives into fruition. To achieve objective 1), shadowing of stakeholders (i.e., site mentor, staff, and volunteers) was completed to glean interpersonal communication skills to effectively target the prospective audience. Introduction of the communication platform, “Network for Good,” was also accomplished to send weekly reminders to staff, board members, and volunteers. Along with using that platform, correspondence with participants via email, phone, and text were also completed. Lastly, the platform WordPress was utilized to update the program calendar so that it reflected the programs of the week.

To achieve objective 2), involvement with on-hill ski instruction and use of the adaptive ski equipment was completed to facilitate program development. Revisitation of the literature was also conducted to review adaptive ski equipment and their intended uses for educational and program development purposes. Lastly, to fulfill objective 3), strategic planning meetings were attended to learn about ongoing organizational needs. During these meetings, the internal challenges of Challenge Mountain were discussed; these were used as benchmarks to direct the program development needs for the remainder of the DCE. For example, to help capture the perspectives of the participants and volunteers, surveys were created and conducted to gather feedback on the program’s strengths and
weaknesses. A blog post was also written to share these findings to fulfill the organization’s need of incorporating evidence-based language into their programming. By accomplishing these objectives and participating in the preceding learning activities, fulfillment of the needs of the organization was achieved.

**Implications of Capstone**

As a result of completing this DCE, many implications can be derived that impact Challenge Mountain as an organization and the field of OT. First, the vision of Challenge Mountain stating, “All individuals – regardless of ability – can participate, learn, and enrich their lives in an inclusive environment” (“Mission & Vision,” n.d.) was acknowledged through incorporation of OT principles such as matching the environment to fit the individuals’ needs and encouraging autonomy (Cole & Tufano, 2020). Similarly, this DCE also helped foster the 2025 OT vision statement, “As an inclusive profession, occupational therapy maximizes health, well-being, and quality of life for all people, populations, and communities through effective solutions that facilitate participation in everyday living” (“Vision 2025,” 2017). By providing an environment for individuals with disabilities to make choices, build competence, and participate in a novel or challenging activity alongside their peers, family members, and volunteers, Challenge Mountain aligned with the vision of OT of enhancing the lives of individuals with disabilities and making communities more inclusive and accessible.

To sustain the momentum from completing this project, the proceeding deliverables will be carried forward within the organization. The communication methods established through the weekly update template will be utilized for ongoing communication needs. Furthermore, the survey forms created will be accessible and modifiable to utilize for future programming inquiries. Additionally, streamlining the scheduling logistics for individuals versus groups/families will also be implemented because of this experience. Lastly, the implementation of evidence-based language into the program will heighten Challenge Mountain’s presence within the community and beyond.
Conclusion

To culminate this DCE, many lessons were learned. Through participant observation and the results from the volunteer and participant surveys, the following conclusions were gathered. Common sentiments that emerged from the participant survey were that their experience with the program was motivating, rewarding, and confidence boosting. An ode to the hope that this program brings to people with disabilities was expressed by a participant’s caregiver, “In short, this program and its leaders have been a blessing” (Anonymous, personal communication, March 22, 2023).

Similarly, the volunteer survey captured the impact that this program had on both their experience as a volunteer and the participants they worked with. A volunteer shared, “I had very high expectations for joining this organization that were completely met and surpassed! The team was very welcoming, friendly, and the immediate all-in hands-on approach with getting to meet and work with the [individuals] was fantastic!” (Anonymous, personal communication, April 7, 2023). Another volunteer expressed the impact this program had on the individual they worked with by sharing, “[the participant] kept hollering to me and smiling, ‘I can’t believe I am actually skiing!!!’” (Anonymous, personal communication, April 5, 2023) The volunteer goes on to say, “Moments like that were the reason that each time I walked away, I couldn’t wait for the next time I would get to come back to volunteer!” (Anonymous, personal communication, April 5, 2023) Both the volunteer and participant surveys revealed that the program had a lasting positive impact on those involved.

Although many positive outcomes came from this experience, opportunities for future work became evident. An expressed recommendation from the volunteer survey revealed a desire for more education and training on interacting with people with disabilities and downhill ski progression techniques. Given the dynamics of managing a variety of peoples’ schedules, it was difficult to accommodate time devoted to completing training and education. Historically, Challenge Mountain
utilized videos from the Professional Ski Instructors of America (PSIA) for volunteers to refer to when working with participants. Majority of the education and training, however, occurred while on the hill with the experienced volunteers sharing their knowledge with the more novice volunteers. As a future recommendation, adding an education and training manual for volunteers would be beneficial for program development.

All in all, this DCE revealed that not only does Challenge Mountain provide an opportunity for individuals with disabilities to participate in adaptive skiing, but also a chance to cultivate a sense of belonging and autonomy, which are skills that transcend off the ski hill.
References


Appendix A

Participant Survey

Winter Program Participant Survey

What is your name/group name?

If you wish to remain anonymous, please leave blank.

* How did you hear about Challenge Mountain?

- Word of mouth
- Social media (i.e., Instagram, Facebook etc.)
- Previous experience with programs
- Local community event(s)
- Challenge Mountain Retail Store
- Other

* Which winter program(s) did your group/child participate in?

- Downhill skiing at Boys Mountain
- Sledding at Challenge Mountain Lodge
- Crossed Tree Art Class
- Crossed Tree Dance Class
- None of the above (did not participate)
- Other

* How would you describe your overall experience with the selected program(s)?

If your group or child participated in the program(s), describe their overall experience.

* How was the overall communication with Challenge Mountain?

* How could Challenge Mountain improve your experience as a participant?
Appendix B

Volunteer Survey

Name: [Volunteer Name]

**Volunteer Survey**

* How would you rate your overall experience volunteering at Challenge Mountain?
  - 10
  - 9
  - 8
  - 7
  - 6
  - 5
  - 4
  - 3
  - 2
  - 1

Please explain your rating above.

* How would you rate overall communication from Challenge Mountain?
  - Excellent - Everything I needed to know
  - Good - Sufficient
  - Okay - Needs improvement

Please explain your rating above.

* How could Challenge Mountain improve your experience as a volunteer?
  - More training with adaptive equipment, such as on-the-job training
  - Basic education about interacting with people with disabilities
  - Basic instruction on downhill ski progression
  - More volunteer social opportunities
  - Other

Please provide feedback about your volunteer experience that would help to improve Challenge Mountain programming.

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Do you have a special Challenge Mountain story or moment to share that would encourage others to become involved?

Include a brief testimonial of your experience.

* Would you be interested in participating in volunteer recruitment events?
  - Yes
  - No

Examples include tabling at local community groups, informational school visits, volunteer fairs, etc.

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Appendix C

Weekly Update Template

Weekly Program Update
02/26/23 - 03/04/23
All programs held at Boyne Mtn until further notice

Programs:
- Tues. 02/28 East Jordan K-6th grade, 40 students
- Thurs. 03/02 CharEm East Jordan and Alanson, 20 students
- Thurs. 03/02 Individual downhill ski lesson with Gaeton
- Sat. 03/04 Christ family, 5 participants

Volunteer Needs:
- Tues. 02/28 9:00 am - 2 pm
  - Indoors assisting teachers and students
  - Ski/snowboard instructors and adaptive ski instructors
  - Outdoors assisting with loading/unloading lift
- Thurs. 03/02 9:30 am - 2 pm
  - Indoors assisting teachers and students
  - Ski/snowboard instructors and adaptive ski instructors
  - Outdoors assisting with loading/unloading lift
- Thurs. 03/02 2:00 pm - 4:00 pm
  - Downhill ski instruction
- Sat. 03/04 10 am - 3 pm
  - Indoors assisting family members
  - Sit-ski instruction
  - Assistance with loading/unloading lift

Snow Conditions: Good

Program Calendar

Facebook
Instagram
Appendix D

Text Message Example

Text Message Details

Delivered:
Friday February 24, 2023 @ 11:51am EST

Recipients: 104 contacts
ski instructors (31) (/text_messages/149151/recipient), Winter Volunteers (103) (/text_messages/149151/recipient)

87.5%
Delivery Rate

To: ski instructors, Winter Volunteers
From: 231-216-6767

Challenge Mountain:
Looking for 2 adaptive ski instructors to volunteer tomorrow from 10 am - 2 pm. Please respond to Linda if available 231-497-4060.
Appendix E

Blog Post

Hope on the Slopes

As I slide into my career in Occupational Therapy (OT), I couldn’t be more grateful for completing my internship at Challenge Mountain.

It’s been a privilege to witness the joys, obstacles, triumphs, and thrills of participants gliding down a ski hill.

Like many, my passion for skiing attracted me to the organization. Though I’ve loved every second of being on the slopes, it’s the people who have made a profound impact. I’ve learned that it’s more than just about providing access to skiing, it’s about instilling self-determination.

Self-determination theory is frequently used in clinical psychology research. According to Ryan & Deci, it refers to one’s ability to make choices and take control of one’s life (2000). The field of OT coins it as being an agent of one’s own change - a primary decision maker in all life’s choices (Cole & Tufano, 2020, p. 158). For individuals with disabilities, it’s especially important that their freedom to choose is validated. From my time at Challenge Mountain, I can attest that the staff, volunteers, and board members are dedicated to enhancing self-determination.

There are 3 requirements that facilitate self-determination: competence, autonomy, and relatedness (Brown, 2011). Challenge Mountain fosters these conditions through providing instruction that facilitates competence, autonomy to choose from a variety of activities, and a culture of relatedness so that participants can share experiences with their peers and family.

By integrating these principles into their adaptive recreation programs, Challenge Mountain creates an environment for individuals to forge their own path to mastery in their desired activity. Whether it’s choosing to put on ski boots for the first time, try a new activity, or simply experience wind in their face from a ski run, Challenge Mountain embraces the individual choices that ultimately lead to self-determination in other areas of life.

In summary, my experience with Challenge Mountain has opened my eyes to the endless opportunities that can arise when you allow individuals with disabilities a chance to choose their own adventure. I’ve discovered that hope can be found anywhere – and a ski hill should not be overlooked.

(Mettler, 2023)

References


