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Designing Sport Specific Physical Fitness Programs for Students with Developmental Variations

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**Designing Sport Specific Physical Fitness Programs for Students with Developmental
Variations**

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Childhood General Education

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Submitted in partial fulfillment of the requirements of the degree of
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Abstract

Brian Levine

Designing Sport Specific Physical Fitness Programs for Students with Developmental Variations

This research examined existing options for students with disabilities in the realm of organized physical activity. Findings suggest that children with physical disabilities resulting in wheelchair use and students with the cognitive disability Autism Spectrum Disorder, referred to in this paper as ASD, have limited access to organized physical activity programs, after school sport programs, and physical education. This paper explores the importance of participation in sport for all children, the various barriers to participation for children with disabilities, and the effect on inclusive physical education and organized physical activity for all students. Finally, this paper provides recommendations on how to modify existing facilities and curricula and how to create new programs that are accessible to students with developmental variations.

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1. Introduction and Rationale

During the summer of 2018, I enrolled in EDUC803 - Developmental Variations, a two credit course at Bank Street College that explored how students with various learning and physical disabilities interact with our education system. The culmination of this course was the completion of a research project on a topic of our choosing. During this time, I was experiencing a transitional period during which I eventually decided to leave the classroom and explore other passions. As such, I decided to conduct my research on how individuals with disabilities interact with, and are exposed to, fitness, physical education, and organized physical activity.

That summer, I narrowed the focus of my research to study children with autism. First, I researched what Autism Spectrum Disorder (ASD) encompasses. While the spectrum is broad, the health benefits of physical activity remain universal to all children. Therefore, I was shocked to discover that the United States Department of Education estimates that approximately 95% of children with disabilities, close to 4 million students under the age of 18, *do not* have access to organized sports or proper physical education programs in public schools (Murphy & Carbone, 2008). The logical progression was to next explore what fitness and wellness programs currently exist for individuals with these developmental variations. It was disappointing, while not surprising, to discover that while there are some existing programs for students with disability, there are not nearly as many opportunities as there are for students without disabilities. The existing void led to my decision to spend time using existing literature to better my understanding of different types of disabilities, so I could develop my own recommendations as to what would be an appropriate sport-specific program for a child with ASD. As a resident of New York City and an indoor cycling instructor, I offer suggestions throughout this project on

how to create an indoor cycling program for students diagnosed with autism. In the future, I hope to marry my passion for fitness and love for children and believe this dissertation is a step in that direction.

After exploring opportunities for students with autism, I broadened my search to include students with physical disabilities, specifically those who use a wheelchair. I used the same guiding questions (see below) to maintain direction. I was pleased to find a sizeable amount of existing literature exploring the effects of physical activity on individuals with physical disabilities. Similarly, there are a variety of opportunities for students who use wheelchairs to participate in sports and physical activities. However, I chose to explore wheelchair basketball as it is a popular paralympic sport and there are existing curricula designs that include it into physical education programs.

The research compiled, conclusions made, and recommendations given are intended for all audiences, specifically those who work with, or are in close conjunction with students with the aforementioned developmental variations.

Research and recommendations have been organized to answer the following five guiding questions:

1. What is the importance of participation in sport for children with disability?
2. What should we consider when teaching new sport skills to all children in an effort to emphasize importance when teaching individuals with disabilities?
3. What are common barriers to participation in athletic programs for children with disabilities?
4. How can we create sport-specific programs for kids developmental variations?
5. What is the effect of an inclusive physical education on able-bodied children?

Additionally, the dissertation uses the existing literature as the basis for my own recommendations on how to create physical fitness programs that are welcoming to students and families of students with ASD and/or physical disabilities.

2. Developmental Variations

A. Autism Spectrum Disorder

Autism Spectrum Disorder (ASD) is an umbrella term for a variety of subtypes of disabilities. Some of the most common characteristics include challenges with: social skills, repetitive behaviors (i.e. stimming - the flapping of hands or rocking of the body repetitively), speech, and nonverbal communication. As of 2018, the United States Center for Disease Control estimates that one out of every 59 children in the U.S. is diagnosed with some form of autism. Fortunately, ASD can be diagnosed early, often before the age of three and sometimes as early as 18 months. Some of the telltale signs include:

- By 6 months: Few or no smiles and/or warm and engaging facial expressions, lack of eye contact
- By 9 months: limited or no sharing of sounds with care providers
- By 12 months: babbling, back and forth gestures (pointing, reaching), response to name are all lacking.
- By 16 months: Few to no spoken words.

Additionally, at any age, characteristics of ASD can include: avoiding eye contact, difficulty showing empathy or understanding the feelings of peers, echolalia (the repetition of words or phrases), and intense or unusual reaction to sounds, smells, tastes, lights, etc. Each year, approximately 50,000 teens diagnosed with ASD become adults, and thus lose school-based autism services (“What Is Autism?”, 2012).

It was widely accepted that autistic people were not interested in creating meaningful social connections with other people. Even as our understanding of autism has evolved over the past century, many doctors and specialists maintain this belief. Yet new studies and published

literature are discrediting this stereotype. Vikram K. Jaswal and Nameera Akhtar, in their opinion piece “How to Meet Autistic People Halfway” in *The New York Times*, point out where this common misconception comes from:

There is no question that autistic people can seem as though they are not interested in others. They may not make eye contact or they may repeat lines from movies that don't seem relevant in the moment. They may flap their hands or rock their bodies in ways that other people find off-putting. But just because someone appears socially uninterested does not mean that he or she is (July 13, 2018, para. 3).

However, later in their essay, the authors explain that through their own research and first-hand encounters, they have found that individuals with autism are “very interested in, and in some cases desperate for, social connection. They experience loneliness, say they want friends, and even prefer two-player games over one-player games” (Jaswal & Akhtar, 2018, p.4). Ultimately, just because an individual appears socially uninterested does not mean a generality should be assumed. Simply put, every human being craves social interaction and meaningful connection with their peers. As autistic author Naoki Higashida writes in *The Reason I Jump: The Inner Voice of a Thirteen-Year-Old Boy with Autism*, “I can't believe that anyone born as a human being really wants to be left all on their own, not really,” adding, “The truth is, we'd love to be with other people” (Higashida, 2007, p.13).

Conflicting viewpoints and understandings of the autism spectrum have led to controversies and differences in perspective that exist in the field regarding autistic children participating in sports. Until recently, it was widely believed by parents and doctors alike that sports and autism were like “oil and water” as sports are too active, include too many social cues, and children with autism have too much sensory sensitivity (Showtime Sports, 2016). In the following sections, we will debunk some of these misconceptions and provide alternative pathways to participation.

B. Physical Disabilities

Similar to Autism Spectrum Disorder, the term “physical disability” encompasses a wide range of developmental variations and physical body defects. For the purposes of this essay, we will look at physical disabilities through a broad scope in an effort to include suggestions for as large a population as possible.

The Handicaps Welfare Association defines physical disability in the following way on their webpage:

A person with a physical disability is constrained by his physical ability to perform an activity independently such as walking, bathing, toileting, etc. A person can be physically disabled due to two reasons: Congenital/Hereditary – the person has physical disability since birth or the disability developed at a later stage due to genetic problems, problems with muscle cells or injury during birth. Acquired – the person acquired the physical disability through road or industrial accidents, infections such as polio or diseases and disorders such as stroke or cancer.

According to the National Center for Education Statistics (NCES), as of 2015, there were over 50,000 students aged 3-21 enrolled in public education who qualified as having some sort of orthopedic or physical disability. These disabilities can be broken down into two major categories; musculoskeletal disabilities and neuromuscular disabilities. Musculoskeletal disabilities are classified as an inability to carry out distinct actions and movements in association with certain body parts as a result of muscular and/or bony deformities, diseases or degeneration. These include the loss of limb or muscular dystrophy. In contrast, neuromuscular disabilities are the result of degeneration or disorder of the nervous system. These include cerebral palsy, strokes, and head injuries (Handicaps Welfare Association, 2018).

Athletes with physical disabilities tend to get more exposure to physical activity than students with autism. Partake or view any mainstream endurance events, such as the New York City Marathon, and you’ll see athletes racing in wheelchairs and athletes with visual impairments running alongside guides. Turn on the Paralympic Games and you can cheer for your nation’s wheelchair basketball team. However, this exposure for adults begs the question: what kinds of programs exist for children and students with physical disabilities? How can we ensure that these children are able to overcome the existing barriers to participation? How can

we create good habits for today's youth with disability and promote exercise and organized physical activity as part of their daily routine? In the following sections, we will explore what opportunities exist for students today and how we can better provide pathways for their participation in the future.

3. Benefits of Participation in Physical Activity

A. Physical Benefits

It is widely accepted that physical activity has a positive effect on individuals of all ages. In 2010, Ian Janssen and Allana G LeBlanc published an article in the International Journal of Behavioral Nutrition and Physical Activity with the intention to systematically review studies that examined the relationship between physical activity, fitness and health in school-aged children. After identifying over 11,000 scholarly articles, the authors of the study narrowed their research to focus on seven health indicators: high blood cholesterol, high blood pressure, the metabolic syndrome, obesity, low bone density, depression, and injuries. The results were conclusive: not only is physical activity linked to a myriad of health benefits, but there is a direct relationship between the amount of physical activity and the amount of health benefits. Yet more does not always mean better, as several experiments suggested that even moderate amounts of activity would benefit children who were classified as high-risk; individuals classified as obese or with high blood pressure. The greatest benefits were yielded from aerobic activities that placed stress on the cardiovascular and respiratory systems. However, individuals with low bone density required higher impact weight bearing activity to counteract their morbidity. Additionally, Jansen and LeBlanc's study (2010) made the following recommendations:

- 1) Children and youth 5-17 years of age should accumulate an average of at least 60 minutes per day and up to several hours of at least moderate intensity physical activity. Some of the health benefits can be achieved through an average of 30 minutes per day.
- 2) More vigorous intensity activities should be incorporated or added when possible, including activities that strengthen muscle and bone.
- 3) Aerobic activities should make up the majority of the physical activity. Muscle and bone strengthening activities should be incorporated on at least 3 days of the week. (p. 2)

Reports like the one published by Jansen and LeBlanc in 2010 are common, but in the United States we continue to see a decline in participation in physical activity. As a result, we are witnessing a lack of development of an active lifestyle in today's youth. The outlook is worse for children with disabilities. Those born with disabilities have a higher predisposition to lower cardiorespiratory fitness, lower levels of muscular endurance, and higher rates of obesity (38% higher!). Ensuring that youth with disabilities have access to physical activity is imperative, as there are added health benefits for these individuals. The addition upside includes optimized physical functioning, enhanced overall well-being, controlled progression of chronic comorbidities, improved overall health and function, and a positive social impact on the condition of the child and his or her family. However, these children are more restricted in their participation and, as a result, have lower overall levels of fitness and higher levels of obesity than their peers without disabilities. Research also shows that for children and youth with disabilities, this sedentary lifestyle increases with age, increasing risk for obesity and the related health problems that come with it over time. These consequences include: coronary heart disease, Type 2 diabetes, high blood pressure, lipid disorders, and osteoarthritis (Bedini & Thomas 2012).

B. Social-Emotional Benefits

For children with disabilities, participation in organized physical activity can also provide benefits that extend past the physical domain. The social-emotional benefits are equally, if not more important. Author Ashley Thomas was published in *Therapeutic Recreation Journal*, in which she detailed how to create a successfully integrated, community based, adapted sports program for children with disabilities. Thomas' program was built on a philosophy of personal empowerment. Thomas (2012) details her own personal experience:

Suffice it to say that I battle a body that can change daily. I use a wheelchair, but importantly, I have discovered a life with sports. ... It grew out of the discoveries I made through a life of chronic pain and having lived with spina bifida all my life. From that

journey, I learned that sport revitalizes self-esteem. Sports allow you to manage an aspect of life when your world is otherwise full of daily turmoil. It builds mental tenacity that can help push you through the daily challenges of a broken body. I gained social capital, became a part of my community, and interacted with others in a meaningful and rewarding way. I found laughter again. Fear increasingly took a back seat. Hope arose and pointed to a new tomorrow. (p. 285)

Thomas is not alone in her feelings and experiences. The author continues to explain that individuals with disabilities have found physical activity as a useful tool to “manage” their disability by providing them with a sense of control and autonomy, in a way “normalizing” their bodies (Groff & Kleiber, 2002). Thomas also cited a variety of articles that quoted children with disabilities saying that participation in physical activity served as an “equalizer” because they provided a sense of normalcy when playing alongside their peers (Thomas, 2012).

Thomas created Bridge II Sports (B2S), a nonprofit organization now in its’ eleventh year, that provides opportunities for children and adults with physical disabilities to play team and individual sports. The programs are supported by a coordinated web of community partners. Thomas’ mission was clear, “to help individuals discover tenacity, confidence, self-esteem, and the joy of finding the player within” (Thomas, 2012).

In addition to confidence and self esteem, participation in physical activity can also help children with disabilities develop a sense of identity. Developing identity can be more complicated for children with disability, due to societal constraints that influence their idea of “self” and the limited number of opportunities presented to them to partake in activities. Organized physical activities provide access to skill development, emotional expression, social interaction, and connection with others.

Participation provides pathways through which children can develop an overall sense of competence in skills not associated with sports. When surveying participants in the American Association of Adapted Sports Program (AAASP), an after school adapted sports program operated in a large metropolitan area in the southeastern United States, one participant stated, “I know that if I can play basketball and all those other sports then I can probably do other

things. It has taught me how to work hard for stuff that I want and how to work with other people without getting mad” (Groff and Kiebler, 2001, p.322). The AAASP provides opportunity for youth with disability to be social, active, aggressive, proud, and free from boredom. Finally, the AAASP creates a channel for important social interaction. Unfortunately, these much needed social interactions are not always readily available in schools and communities around the country. But participating in an adapted sports program provides children with a sense of belonging and gives them a channel where they can “be themselves.” One participant explained that when individuals with disabilities are mainstreamed (at school), “you have to spend an awful lot of your energy letting people know that you are not incompetent and that you are not retarded. It was good to come here [the adapted sport program] and not have to deal with that” (Groff and Kiebler, 2001, p.324).

4. Barriers To Participation

If the benefits of physical activity are universal, then why isn’t every every child with a disability enrolled in an organized after school program that provides structure, coaching and emotional support? While studies have shown that individuals with physical disabilities such as spinal cord injuries show a strong interest in participating in organized physical activity programs within their communities, only a small percentage of them are active. The numbers are alarming: 95% of children with disabilities do not have access to organized sport or physical education programs in public schools. Only 8% of United States elementary schools provide daily physical education classes. 75% of schools allow their students to be exempted from physical education (Groff & Kleiber, 2001).

There are an abundance of factors that children with disabilities and their families cite as barriers to participation. These barriers include: the child’s functional limitations, high cost of participation, lack of programs and nearby facilities, and the high cost of necessary specialized equipment. Additionally, family demographic plays a role, as families who are physically active

tend to promote a similar lifestyle for their children, with or without disabilities (Murphy & Carbone, 2008). Ultimately, home and community environment combined with family factors are key determinants of participation, as opposed to characteristics of the children themselves.

A. Structural Barriers: Access to Organized Physical Fitness Programs

In 1990, the Individuals with Disabilities Education Act, the reauthorization of the Education of All Handicapped Children Act, became law. In it, free and appropriate public education was mandated to all children with disabilities. Additionally, the Act states that “no individual shall be excluded because of disability in programs that receive federal funds” (Murphy & Carbone, 2008, p. 1059). Because physical education is a federally mandated component of special education, pediatricians and families of children with disabilities can request that specific and adapted physical education programs are present in their child’s education plan. Schools are required to comply. It is expected that they modify existing programs or create new ones to include the children in question. An additional stressor on educators in these public school settings, these teachers must take their students’ disabilities into account as they construct a curriculum that supports them. With these federal laws in place, and initiatives from the United States Department of Health and Center for Disease Control stressing the importance of everyday participation for all children in physical education programs, it begs to question the statistic mentioned earlier: why do approximately 95% of children with disabilities (roughly four million students under the age of 18) not have access to sport programs or proper physical education programs in public schools? The most common reason: schools are failing to adjust their curricula to make programs inclusive and accessible to all students (Murphy & Carbone, 2008).

Unfortunately, the majority of students with disabilities find themselves socially segregated. Between low performance expectations and negative social stereotypes, these students are presented with minimal opportunity to participate in organized group physical

activities. The negative stereotype combined with a lack of knowledge results in a decrease in access for students with disabilities to organized physical activities that they crave and that their bodies need. And while there are some specialized programs, the ones that integrate students with disabilities into the greater community are more beneficial in knocking down societal walls. These productions are even less common.

B. Other Major Barriers

Intrinsic barriers to participation, such as lack of motivation or energy, and a shortage of resources, such as lack of knowledgeable instructors and of available programs, also serve as barriers to participation. Ashley Thomas (2012) gives a thorough overview of these additional obstacles in her article in the *Therapeutic Recreation Journal*:

Many perceptions, both intrinsically (potential participant and/or parent) and extrinsically (attitudes of others, access, transportation, finances), can prevent potential participants from even inquiring about adapted community sports programs. Negative and/or ignorant (as in lack of knowledge) attitudes about the nature and benefits of adapted physical activities of family members, community partners, and participants themselves, can serve to negate hopeful prospects. Common intrinsic concerns come from previous experiences, lived or learned, that include fear of teasing, bullying, or exclusion of individuals with disabilities within community and school programs. Sometimes parents are overprotective, or participants are anxious about not fitting in. Stereotypes that exist about the potentially dangerous consequences of sports for people with disabilities can also dissuade potential participants or encourage parents to restrict dependents. In fact, these stereotypes can even be found in the agencies providing the adapted sports program. One B2S parent commented that in many agencies they looked into for adapted sports, the staff treated her son as if they "felt sorry for him" and would not allow him to fully participate for fear of him getting hurt (p. 289).

According to Thomas, there seems to be no limit to what can serve as a barrier to participation for children with disabilities. Intrinsic barriers are disheartening but unavoidable, as many children experience anxiety over the potential for being bullied by their peers. Even athletes who are currently participating in programs feel rejected by their able-bodied peers who look at them as secondary athletes (Hutzler & Bergman, 2011).

On top of the intrinsic barriers, there are external factors that deter students with disabilities from participation in physical activity. One major issue is the lack of knowledgeable

coaches, adults and staff members to supervise these programs. Not only can this steer away overprotective parents from entrusting their children to care providers who lack the appropriate credentials, but it can have adverse effects on the community as a whole. For example, there have been multiple accounts of programs resisting the inclusion of children with disabilities due to concern over the liability of a child with a disability getting hurt during an activity. This fear comes from the common misconception that children with disabilities are fragile and more likely to be injured. With this misconception comes the idea that these children should avoid sports and other rigorous activities that are generally associated with injury. In fact, athletes with disabilities have a similar injury rate to their able bodied peers (Murphy & Carbone, 2008). Therefore, another obstacle that inhibits participation comes from a lack of understanding from participants, their families, as well as service providers.

C. Conclusions

It has been widely believed by parents, teachers, and doctors alike that sport and disability do not mix. Arguments against participation in physical activity included: sports are too active, sports have too many social cues, and students with ASD have too much sensory sensitivity (Showtime Sports, 2016). However, there is a new school of thought that is questioning these beliefs. The barriers discussed are surmountable. Not every child is going to be a sports fan or full-blown athlete, but there is opportunity for every child to be active. It starts with a new perspective, a “yes you can” attitude, and a lot of positive reinforcement. The goal of various organizations and many pediatric doctors is to promote inclusion for all children with disabilities in the sport or physical activity that is the right fit for them. Today, there are an array of sporting activities that are available to children with disabilities. There are even a handful of guidelines that exist to help pediatricians recommend certain activities for children with certain conditions. For example, students with Down Syndrome are recommended and encouraged to participate in any sport that they enjoy, so long as the sport forgoes contact and collision

(Murphy & Carbone, 2008). Ultimately, we must empower our students with a “can do” attitude, rather than the discouraging message that they “can’t do that because...”.

5. Creating Developmental Variation-Friendly Facilities

People young and old with all types of disabilities have more difficulty engaging in physical activity due to physical barriers presented to them by their environment. Fitness facilities often lack accessibility, and as consequence, limit opportunity for participation by students with disabilities (James, et. al, 2017). The question that we must ask ourselves is: how can we do a better job at making sure that students with disabilities have access to physical education and sport participation?

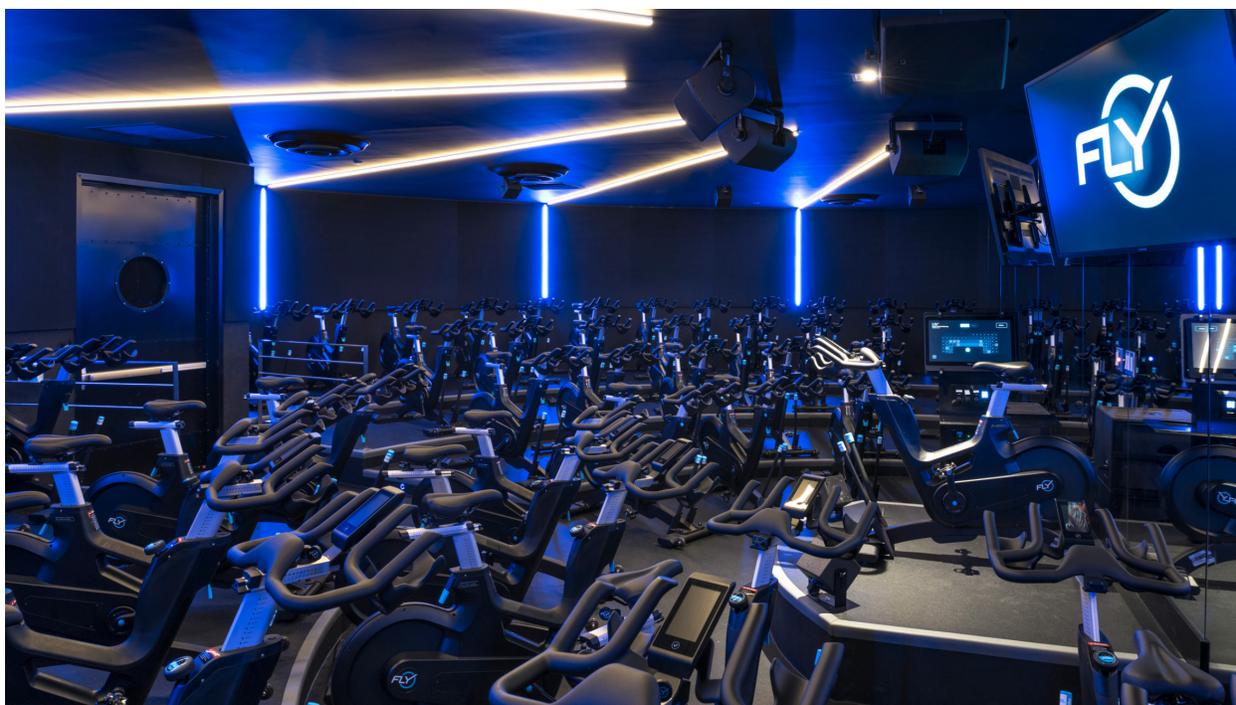
A. Autism Spectrum Disorder

For individuals diagnosed with Autism Spectrum Disorder, we can follow the lead of our friends on Broadway. In October 2011, The Theater Development Fund (TDF) created the Autism Theatre Initiative (ATI). The Lion King becomes first ever ASD-friendly performance of a Broadway musical. Lisa Carling, the director of the TDF’s Accessibility Programs launched the ATI in 2011. She says that the idea came from hearing parents’ negative experiences trying to bring their children with autism to performances and shows that were directed to a general audience. Behaviors that are common to students with ASD, such as stimming (self-stimulatory repetitive behavior) or making repeated sounds, would draw complaints from other theater-goers. While unfortunate, audience members tend to look down upon individuals with special needs, believing that their experience is less important than their own (Viswanathan, 2016).

The tri-state area is one of the highest concentrated areas of children with autism in the country. According to the Center for Disease Control and Prevention (CDCP), one out of 59 US children has ASD. In the tri-state area, the frequency of ASD increases to one out of 45 children. Therefore, the demand of autism-friendly facilities and events in New York is large, making New York City an opportune location to test out autism-friendly redesigns. When

designing or modifying existing facilities, we can take into account many of the techniques that the TDF uses to create autism-friendly performances. These include less jarring or startling sounds, less strobe and spot lights, keeping the house lights on during the performance (just dimmed), staffing break areas with autism specialists, and encouraging the theater-goers to move around, dance, and make noise (Viswanathan, 2016).

Using these recommendations as a blueprint, we can assess the design of various indoor cycling studios. The picture below is from the company Flywheel Sports. The indoor cycling chain has 41 studios nationwide and each studio has a consistent setup.



(image credit: <https://www.flywheelsports.com/>)

The space is far from autism-friendly. Loud, pounding music, combined with darkness, blue strobe lights, extremely close confines, and shoes that clip your feet into the bicycle pedals could result in severe overstimulation and anxiety for a student with ASD.

In contrast, the photo below is taken from Limitless Fitness, a locally owned fitness studio in Staten Island, New York.



(Image Credit: <http://limitlessfitnessstudios.com/>)

Features such as dimmed house lights that remain on, a spacious and open setup, and bikes with foot cages so participants can wear their own sneakers and easily dismount at any time make this studio an example of how to design an ASD-friendly indoor cycling space.

B. Physical Disabilities

Historically, gyms and other physical fitness spaces made the assumption that individuals with physical disabilities did not want to workout. The assumption was made incorrectly, and it prevented proper training for fitness instructors and resulted in clubs designed without accessible equipment. However, in 1990, the Americans with Disabilities Act was passed, altering the specifications and requirements necessary when constructing many public spaces. Buildings such as schools, restaurants, theaters and offices were affected, with new structures required to include ramps and 38-inch wide doorways. Old buildings were required to make the necessary modifications to comply to these new standards. However, physical fitness centers are some of the last public spaces in the United States to become broadly accessible to the physically disabled. New addendums to the Act mandate health clubs to add new features,

such as ample space around weight training machines that make them wheelchair accessible and ramps or lifts to help lower individuals with wheelchairs into pools (Ellin, 2006).

It is necessary that we instill some sense of urgency unto the owners of existing fitness centers to raise the level of accessibility within their establishments. Children with disabilities are predisposed to a higher risk of chronic health conditions compared to the general population, and it is essential that we remove the barriers that we have control over (Rimmer, et al., 2017).

There are many pain points for wheelchair users who are attempting to find the right setting to work out. Crowded and cramped gyms, narrow doorways, and a lack of ramps or elevators are just some of design flaws that serve as barriers for these gym-goers. If we are to create new fitness facilities that are truly accessible to individuals who rely on wheelchairs, then we must do more than what the ADA recommends. In their 2017 study published in the *Disability and Health Journal*, James Rimmer, Sangeetha Padalabalanarayanan, Laurie A. Malone, and Tapan Mehta reported:

In general, fitness facilities had a high degree of inaccessibility in several different areas. This low level of accessibility is disappointing given that the Americans with Disabilities Act (ADA) was signed into law more than 25 years ago with the intention that public facilities would make the necessary accommodations to allow people with disabilities to have a similar level of access as other members of the community. Unfortunately, the ADA guidelines only address certain features of the built environment (e.g., ramps to enter the building, one accessible bathroom) and some elements of the space around exercise equipment, but more refined features of access such as information and signage, clear access routes, written policies associated with accessibility and universally designed exercise equipment do not fall under the purview of the ADA therefore leaving managers and owners with little incentive to make their facilities more accessible to people with disabilities (p. 220).

Going above and beyond ADA standards would mean creating a floorplan where all gym equipment was spaced out and accessible to gym members in wheelchairs. The facility could include a wheelchair storage area where athletes could leave their sports wheelchairs overnight and store their everyday wheelchairs while working out. Hallways and door frames would be designed to be significantly wider than 38 inches (the minimum requirement), to allow for multiple people to get through without causing traffic.

Another important factor to consider when designing a wheelchair-friendly fitness facility is how to make group fitness classes appealing and accessible. In today's fitness landscape, group and boutique fitness has become a major player, and the shift away from big box gyms is a current trend. In order to stay competitive and provide clients with a variety of options, a wheelchair accessible fitness gym should also have wheelchair accessible group fitness classes. While this may require additional training for instructors and personal trainers, it is also an opportunity to empower adults with physical disabilities to take on the role of instructor and provide organized physical activity to students and children. An adult who is physically disabled leading a fitness class to students who are physically disabled not only instills confidence in students and parents that the instructor can empathize, but it also provides students with a role model that is very much like them. Additionally, a physically disabled instructor will understand, due to personal experience, how disability can affect energy level, range of motion, and body temperature during exercise in different ways than a non-disabled student. An example of this is Kris Saunders-Stowe's Wheely Good Fitness. Located in Hereford, Herefordshire in the United Kingdom, Saunders-Stowe, who uses a wheelchair himself, initially set out to increase organized physical activity options locally. In the space that he created, Saunders-Stowe instructs aerobics, agility and even spin classes, using specially designed rolling stations that allow the back wheels of the wheelchair to roll freely, for students in wheelchairs ("Roll In, Work Out," 2017).

Finally, one additional adaptation we can consider when designing these types of spaces are portable, compact lifts. If a business, school or facility is redesigning, rather than building from scratch, lifts are a great alternative to assist students who are in wheelchairs with climbing stairs as opposed to installing an elevator or building a ramp. When installing a lift, we can take into consideration a child's autonomy, and look for options that allow children to push a button to raise and lower. The increase in independence acts as a self-esteem booster, while also eliminating the need for additional staff members to operate the machinery (Lacey, 2013).

6. Designing Organized Physical Activity Programs For Students with Disabilities

A. Considerations When Teaching New Skills

Designing a sport-specific program for a group of students is a massive undertaking. When factoring in accessibility for students with disabilities, there are additional areas that must be considered. When teaching a new sport-specific skill set, a coach or physical education teacher must target cardiovascular endurance, balance, flexibility, muscular strength and agility. In addition to these areas of focus, teachers must also be conscious of how they make the sport accessible, safe, and enjoyable. Other considerations include the health status of the child or children with disabilities, and the ability of the child and their family to understand any risk involved in participation (Smith & Patterson, 2012). Educators must also put into place strategies to minimize the risks of illness or injury. Finally, it is recommended that students with disabilities enroll in organized physical activity programs that are of longer and more frequent duration, but less intense (Murphy & Carbone, 2008).

Physical considerations for children with disabilities are extensive, and tend to be variation-specific. In their 2008 article published in *Pediatrics*, authors Murphy and Carbone elaborate:

Careful attention must be directed at proper training, hydration, clothing, and equipment. Some children with disabilities have impaired motor coordination, decreased endurance, limited mechanical efficiency, and osteopenia, factors that can predispose to musculoskeletal injuries and overuse syndromes. For example, athletes in wheelchairs have increased rates of shoulder overuse injuries and carpal tunnel syndrome (p. 1058).

Therefore, each child should be assessed independently, to take into account their own developmental variations. Current health status, intensity of activity, specific sport in question, what modifications can be made to make the sport safer (if any), what type of equipment is available to adapt the sport, and the understanding of both the child and parent of all risks involved must be discussed before beginning participation in a new organized physical activity.

To put into practice, recommendations of activity will vary between a student with a cervical spinal cord injury and a student diagnosed with autism. The student with the spinal cord injury could be permitted to participate in wheelchair rugby or basketball, but only after the student, parents and coaches can recognize symptoms such as acute sweating, apprehension, and sudden onset of headache as signs of autonomic dysreflexia, a sudden onset of extremely high blood pressure. Autonomic Dysreflexia is more common in people with spinal cord injuries and can be dangerous if unnoticed and untreated (Murphy & Carbone, 2008). In contrast, if a student is diagnosed with ASD and struggles with verbal and nonverbal communication, they may have difficulty following verbal instructions involved in team sports. This child might benefit from participation in a sport that is traditionally more individual, such as cycling, swimming or martial arts.

In addition to the physical health concerns, Murphy and Carbone also highlight the importance of goal setting and proper coaching, stating, “The establishment of short-term goals, emphasizing variety and enjoyment, and positive reinforcement through documented progress toward goals can help spark and sustain the motivation for participation” (Murphy & Carbone, 2008, p. 1059).

Ultimately, preparation for a new activity is an extensive process that must involve multiple parties. It goes beyond the discussion between student and teacher, and should also include physicians, physical therapists, parents, and other individuals who are invested in the well being of the child. The evaluations of a child should be done over time and decisions should not be made in haste. With proper guidance and open discussion, “the risk of injury to physically challenged children is no greater than that to athletes without disability” (Murphy & Carbone, 2008, p.1059).

B. Designing A Universally Accessible Program

In the following sections, I provide recommendations on how to design specific organized physical activity programs for students with developmental variations. Before creating a curriculum, a question that must be answered is: how can we design “universally accessible” programs? A universally accessible program is one that provides modifications to physical activities so that individuals of all different abilities can participate. Before creating a new program, students with disabilities should be consulted and their needs and expectations should be addressed. For example, if the program is to be designed for students with autism in mind, multiple students with ASD and their families should be on board as consultants during the planning, implementation, and evaluation stages. All parties, including physicians and physical therapists, should be encouraged to contribute feedback and express any concerns with the programming.

Additionally, students and their families should help oversee the assessment and design of accessible facilities. It is helpful to view obstacles through the eyes of an individual who is forced to overcome them day in and day out. A person with a physical disability is likely to be more aware of the width of doorways, the presence and location of accessible ramps and walkways, and how exercise equipment is spaced throughout the facility (New York State Department of Health, 2008).

C. Creating A Sport-Specific Program: Cycling for Students with Autism

One of the great joys of childhood is learning how to ride a bicycle. The experience is a right-of-passage, a bonding experience between caregiver and child, and one of the first real increases in a child’s independence. The opportunities for children diagnosed with autism to learn how to ride a bike are unfortunately limited. Children with ASD can be hesitant to take risks. They may need additional coaching and support to master the skills needed to ride a bike. Nonetheless, programs like “You Can Ride 2,” based out of Edmonton, AB, Canada, are taking

on the challenge in an attempt to provide structured coaching and programs so that children with cognitive disabilities can learn how to ride a bike.

You Can Ride 2's objective is to create a world where all children, regardless of their cognitive function, can experience the joys and freedoms of riding a bike through adaptive instruction. The organizers offer a variety of modified bicycles so that students with all different types of disabilities have access. The bikes are loaned out to students and their families during the summer, and stored at different schools during the cold winter months so they can be used indoors (You Can Ride 2, 2018).

D. Designing a Learn To Cycle Curriculum

You Can Ride 2's six week learn to ride experience is designed with children with cognitive disabilities in mind. Each session begins with a group meet and greet, teacher led stretch, and a group ice-breaker game. Additionally, the lesson plans for each session are introduced both verbally and visually to ensure differentiation. You Can Ride 2 encourages children to learn the skills necessary to ride a bike through a variety of techniques. Although sessions are designed to accommodate small groups, there is careful use of individualization throughout, as each child is given a one to one volunteer who works with them to ensure that all students feel supported. Directions are simple, delivered clearly, and paired with predictable verbal cues. Volunteers run alongside new riders when they are learning to balance working to prevent as many falls as possible by both catching the bike before it falls and by providing physical prompts. The sessions follow the same sequence each week to encourage a predictable routine. And finally, lessons finish with group activities that promote the opportunity to celebrate accomplishments with generous encouragement and praise (Smith & Patterson, 2012, p.93-118). A sample six-week lesson plan based on You Can Ride 2's curriculum is outlined below. It is adapted from Veronica Smith and Stephanie Patterson's *Getting Into The*

Game (2012). Each lesson has a specific focus that builds upon the previous lesson and teaches a variety of sport-specific skills.

Week	Focus	Skills Taught
1	Basic skills on/around bike	Self safety check
		Learning the parts of the bike
		Getting on/off bike
		Using the brakes
		Moving while on bike with adult support
2	Getting Comfortable On Bike	Preventing falls / how to fall properly
		Coasting with feet off pedals
		Braking on command
3	Balance and Pedaling	Coasting with feet on pedals
		Cornering (steering)
		Beginning pedaling
4	Getting Comfortable with Riding	Increase pedaling confidence
		Introduce hand signals
		Turning while pedaling
5	Advanced Skills	Shoulder checks
		Passing other riders
		Figure Eights
6	Trail Ride!	Trail Ride!

Following the groundwork laid by programs like *You Can Ride 2*, we can create our own cycling programs for students with cognitive disabilities in other major metropolitan areas. When starting these programs, it is important to take into consideration the surrounding area and the environment that the students live in. For students located in the New York City metropolitan

area, I recommend utilizing the abundance of indoor cycling studios to first familiarize children with balance, the pedaling motion, and working up a sweat before taking them out onto the road. Outdoor riding requires a greater amount of preparation. One must consider the route or area to ride, take into account weather and variables outside of human control, and factor in expenses such as sunglasses, gloves, visors, and helmets. Creating an indoor cycling class for students with disabilities is a responsible first step to teaching children how to ride a bike.

E. How To Modify Indoor Cycling Class For Students With ASD

Inside, the bikes are stationary, the climate is controllable, adults can supervise easily adjacent to the bikes, and directions can be clearly communicated verbally by the instructor and visually with use of television screens. The allure of stationary bikes is magnified when working with students with ASD. Most children are developmentally ready to engage in the physical balance and coordination skills required for bike riding between the ages of 5-7, however children with ASD may not be ready until several years later (Smith & Patterson, 2009). Climate and outdoor variable control is equally exciting when working with students who are sensitive to noise or touch. Eliminate concern over the chance of rain and the noise of street traffic, and outside factors that stimulate the somatosensory nervous system are neutralized. And because many studios are outfitted with screens or monitors to display statistics during class, there is the added benefit of having the option to play music videos for increased visual stimulation for students who feel bored. Additionally, during the class the instructor has the option to broadcast a clock to provide ASD students with structure so they know exactly how long they'll be working out. Or teachers can show visual cues that are planned to mimic the program; for example, a clip art or video of a student increasing their speed or resistance at the appropriate time.

As instructors and volunteers, there are different types of support that the adults in the room can provide to students learning to ride for the first time. Environmental supports help instructors provide information to students about the context in which they are learning. There

are three broad categories of supports that have been found to have a positive impact on learning for children with ASD. These categories are: temporal supports, procedural supports, and spatial supports (Smith & Patterson, 2009). Temporal supports include visual aids, such as clocks or timers. Students with autism or other cognitive disabilities may have difficulty transitioning between activities. Temporal supports help students understand the sequence of events. Procedural supports help explain the steps in an activity and how they come together. An example of a procedural support is providing a name tag for each individual in the room. Spatial supports help students better understand their surroundings. When modifying an indoor cycling studio for students with ASD, spatial supports can include floor markings, lighting considerations, and volume considerations.

A additional type of support that must be considered when conducting these classes are instructional supports. Students with ASD benefit from clear, systematic instruction. These learners must focus hard on what to do with their bodies. Therefore, instruction should be kept short, sweet, and to the point. For example, something as simple as, “turn the resistance knob to the right so the number on your screen says 15” is clear and concise. Additionally, having the instructor model what he or she wants the students to do is a powerful teaching tool. When actively demonstrating the skill, the closer the model is to the participant with ASD, the better. Keeping this in mind, one might consider creating an inclusive program where non-disabled students ride side-by-side to students with disabilities. Finally, specific verbal feedback is a crucial tool to implement while teaching. After a student attempts to copy a skill, the instructor should provide verbal feedback. Teachers should be specific about what went well. For example, “I love the way you pedaled faster for 30 seconds!”

Lastly, a type of support that instructors can consider is how to keep their students constantly engaged. Adults can do this by promoting structure and routine, but adding enough variety to prevent boredom. For example, each lesson can use the same warm up, but introduce

new techniques, such as sprinting, standing up on the pedals, or increasing resistance, in subsequent classes (Smith & Patterson, 2012,).

F. Making The Leap Outside

When it is time to make the leap from the studio to the outdoors, a proper bike fitting is an essential consideration. The proper fit helps the rider coordinate steering, pedaling, and balancing simultaneously. It is important to purchase a bike that fits the child right now, not a bike that he or she will grow into. When fitting a child to their new bike, consideration must be taken to ensure that with the seat at the lowest setting, the rider should be able to place both feet flat on the ground. Similarly, with the seat at the highest setting, the rider should still be able to just touch the ground with the tips of their toes. Finally, a rider's knees should never hit the handlebars (Smith & Patterson, 2012).

There are additional equipment considerations that should be addressed before making the transition to outdoor riding. A helmet is a non-negotiable must have, and many states have laws that require young cyclists (often 16 years old and younger) to wear helmets when riding outdoors. Elbows and knee pads are optional, but can provide some additional peace of mind for a new rider. And a bell or bike horn is highly recommended as it can be used to alert nearby riders or pedestrians of an approaching cyclist.

G. Creating A Sport-Specific Program: Wheelchair Basketball

While there is ample opportunity to create an organized group physical activity plan that centers around riding bicycles, it is no secret that the sport of cycling is predominantly an individual sport at the recreational level. Basketball, on the other hand, is a team sport that many children are exposed to from a young age. A global game, basketball appeals to kids around the world who immortalize mega-stars like LeBron James, Stephen Curry, and Elena Delle Donne. Students with physical disabilities may feel discouraged and limited in their opportunities to participate in organized team sports. However, wheelchair basketball is one of

the most common and accessible options for students, both with and without disabilities, to participate in.

Unlike riding a bicycle outside, creating an organized wheelchair basketball program does not face the same environmental factors such as weather variables and street traffic. This makes wheelchair basketball an attractive option for students with disabilities, as the only additional equipment required outside of a wheelchair is a basketball. While high-end, sport-specific wheelchairs can be upwards of two thousand dollars due to aerodynamic design and lightweight materials, students starting out can feel empowered to participate in the wheelchair that they currently own. Wheelchair basketball can be played anywhere where there is a flat surface and basketball hoops, however it is predominantly played indoors in a gym or on a basketball court.

H. Wheelchair Basketball 101

In the most basic sense, the rules of wheelchair basketball are almost identical to stand up basketball. Due to basketball's popularity, this makes it a popular choice when building a curriculum, as it is likely that many students will be familiar with the game. In strict wheelchair basketball, where all players on the court at a given time use a wheelchair, five players from each team are on the court during gameplay. Each game consists of four 10 minute quarters with the option of a 5 minute overtime period if the score is tied at the end of regulation. Scoring in wheelchair basketball is the same as stand-up basketball. Teams are awarded 2 points for a shot inside the three point line, 3 points for a shot beyond the three point line, and 1 point for a foul shot.

When it comes to dribbling and fouls, wheelchair basketball begins to diverge from its' stand up counterpart. While there is no double dribble rule in wheelchair basketball, a player is called for traveling if she places the ball in her lap and pushes her wheelchair more than twice. After two pushes, the payer is obligated to shoot, pass, or dribble the ball again. In terms of

fouls, a player's wheelchair is considered an extension of his body. Thus any contact made with the chair can result in a foul called, such as charging or blocking. Additionally, if at any point a player lifts her legs to gain an advantage in height, this will result in a technical foul. Players must remain fully seated in their wheelchairs at all times. Finally, if a player at any time falls out of their chair, a referee can make the decision to stop play if it appears that a player may be at risk of injury. Otherwise, play will continue and the athlete must hoist themselves back into their chair before resuming participation in play (Wheelchair Basketball Canada, 2018).

I. Designing A Wheelchair Basketball Curriculum

A successfully designed wheelchair basketball curriculum closely mirrors that of a non-disabled basketball curriculum. At the elementary grade level, instruction focuses on the development of skills and game sense. These skills include shooting, dribbling, ball handling, and controlling the wheelchair. A sample week-long lesson plan is outlined below, adapted from Philip Ward and Henry Lehwald's *Effective Physical Education Content and Instruction* (2018). Each lesson builds upon the prior and a variety of the aforementioned sport-specific skills are taught.

Lesson	Warmup	Introductory Application Game	Content Development	Closing Application Game
1	Non-specific warm up for flexibility and agility	n/a	Stationary partner passing	End line game
			Three person sliding	
			Wall shooting with partner rebounding	
2	Passing: chest and bounce passes	Endline passing game	2v1 passing: moving to get open	End line game
	Shooting: wall shots		individual dribbling	
3	Passing: chest and bounce passes	Endline passing game	3v3 passing	End line game

	Shooting: wall shots		Step back shooting	
	Individual dribbling: dominant and non dominant sides		Number dribbling	
4	Passing: chest and bounce passes	Endline passing game	3v3 passing	Mat-basketball with shooting game
	Shooting: wall shots		Number dribbling	
	Individual dribbling: dominant and non dominant sides		Dribbling in general space	
5	Passing: chest and bounce passes	Mat-basketball with shooting game	Red light green light with dribbling	Freeze tag game
	Shooting: wall shots			Mat-basketball with shooting game
	Individual dribbling: dominant and non dominant sides			

Following the groundwork laid by experienced coaches and existing programs, we can create our own wheelchair basketball curriculum. Ward and Lehwald recommend starting by teaching shooting and passing skills. In order to do this properly, a teacher or instructor should assess a student's current ability by first demonstrating the proper technique of shooting a basketball while sitting in a wheelchair followed by observing the student as they practice free throws. After demonstrating, instructors should walk around the gymnasium to work one-on-one with students to answer any questions and make sure they are following proper form. The instructor can also record the number of shots made during an allotted time. After one-on-one work, students can break into groups of two or three and challenge each other to see who can make a set number of baskets the fastest. The instructors can again survey the room and take notes if necessary. At the end of the lesson, the teacher should bring the students together to see if there is anything they do not understand or any questions they would like to share with the class as a whole (Cook, 2012).

There are a variety of different drills and games that can be used to practice dribbling and ball handling; the next skill set that should be taught when designing a wheelchair basketball curriculum. One such game is Slovakian Basketball Dribbling. In this game, each participant has a personal basketball. There is one “game ball” that has a noticeable distinguishing characteristic, such as different colored markings. The objective of the game is to maintain the “game ball” in your lap for as long as possible while simultaneously dribbling your personal ball. All the while, other players can knock your personal ball away, causing you to forfeit the game ball so you can retrieve your personal ball. This game teaches many skills. First, it encourages athletes to dribble lower when stationary and to protect their personal ball from opponents. It also teaches students to dribble to an open area of the floor and look for space on the court. Additionally, the game teaches mental endurance and forces students to come up with strategies to deal with and manage frustration.

Another game to work on dribbling skills is knockaway. In this game, each child has their own ball and must dribble within a specified boundary on the court. The boundary can change based on the number of participants and a good starting point is the half court line or three point arc. If a player’s ball goes out of bounds or the player crosses the boundary line, he or she is “out” and must perform a specified task (such as doing a sprint) before rejoining the game (Wheelchair Basketball Canada, 2011).

The third skill to introduce is wheelchair control. This skillset helps athletes develop agility and speed in their chairs. Similar to dribbling, there are a multitude of games and activities to help develop different aspects of chair control. Areas include increasing acceleration speed and power, learning how to properly stop, and understanding the differences between short and long strokes on the wheels. A great partner game to teach acceleration is called the half-court tow. In this game, students are placed in teams of two. The teams line up on one endline, facing the half court line, in single file. One partner, the towee, holds on safely to the back seat bar of the second partner, the tower. The tower accelerates, focusing on powerful,

explosive pushes, until they reach the half court line. At half court, the towee releases, and the tower continues to push hard, accelerating even more as the weight has decreased, until reaching the second endline. At the endline, partners switch roles and repeat the drill coming back to where they started. As with teaching any new skill, it is important for teachers and instructors to provide clear and specific feedback. Such examples include, "Nice job! You gripped the wheel hard enough to stop it's rotation completely," and "Nicely done. You kept your head level and eyes scanning the floor even as you accelerated" (Wheelchair Basketball Canada, 2011).

As skills are honed, teachers can incorporate them into tasks and game play as drills become more complicated, and modified games are added into lesson plans. Students can build up to full action game play by first participating in three on three half court games, followed by four on four full court games, and finally overload games (such as two versus one, or three versus two) to better develop game sense. Overload games place emphasis on dribbling and shooting in game-like conditions and allow for greater success when the students apply the techniques learned in earlier lessons (Ward & Lehwald, 2018).

J. Creating A Community Hub

Once the curriculum is designed, the next step in launching an organized physical activity program for athletes with disabilities is finding support from the community. An existing model that outlines a schematic is implemented by the company Bridge II Sports. With sponsors like Metlife, Cisco, Duke University and UNC Chapel Hill, the North Carolina organization develops community-based adaptive sports and physical activity programs for adults and children with multiple types of disabilities. Some of their programs include golf, track and field, sitting volleyball, and wheelchair basketball. Not only does Bridge II Sports provide activities to the community, but they are also active in raising awareness for the lack of opportunities for individuals with disabilities.

Bridge II Sports creates a community hub by reaching out to potential partners in the community and assessing what they can offer to help in the successful functioning of the organization. They also utilize local universities for multiple resources (Bedini & Thomas, 2012). Following their successful business plan here in New York City, we could reach out to sponsors such as Columbia University or New York University when searching for an accessible space to set up organized games of wheelchair basketball. Universities can contribute further as they can fill additional gaps in the program. Undergraduates looking for philanthropic hours can volunteer as staff at events. Engineering students can assist in the building of adapted equipment such as ramps that can help accommodate players' needs.

Any community-based recreational program is going to face extrinsic barriers. The primary barrier to creating a successful organization of this magnitude is funding. Even if space is donated by a university or public park, funding remains necessary for equipment, transport of equipment, transport of athletes, and maintenance of equipment. Ultimately, a creative fundraising strategy is essential to the success of these community-hub designs (Bedini & Thomas, 2012).

K. Tips For Encouraging New Athletes

While designing a program, choosing a location, and securing funds are all obstacles that must be considered, the final hurdle is encouraging athletes to engage in the sport. Many children, with or without disability, can be hesitant to fully immerse themselves into a new activity. Smith and Patterson (2012) provide 10 tips to help coaches, adults, and educators encourage any new athlete in their 2012 book *Getting Into the Game: Sports Programs for Kids with Autism*. These tips include:

1. Understand your students' history. Research their prior activities and what they have participated in in years past. This can clue a coach or teacher into what to build upon.

2. Be well-versed in how to set up and cue a new, sport-specific movement.
3. Encourage new athletes to just DO IT! To master something new, students need to experience a movement or motion. Watching from the sidelines will not be enough.
4. Demonstrate as much as possible. Showing a new movement is more valuable than telling when teaching a new skill. Assist the athlete in walking through a movement as this will help them begin to develop muscle memory.
5. Provide ample opportunities for students to practice and repeat new movements so they can begin to understand the way their body should feel during the activity.
6. Understand your students and their interests so you can understand what keeps them motivated.
7. Have a goal in mind for each practice or session. This allows coaches to provide specific feedback and keeps athletes focused on a specific objective.
8. Praise improvement, no matter the size.
9. At the end of the day, a happy athlete is a successful athlete, no matter what level. Keep practices and activities fun.
10. Provide opportunity for athletes to tell the coaches and instructors how they feel they are improving. This allows them to self-monitor progress and become self directed learners (p.63).

Just like non-disabled athletes, athletes with disabilities benefit from coaches who have a clear understanding of sport-specific movements when they are embarking on the journey of learning a new sport. Instructors, coaches, and educators should hold the understanding of balance, weight transfer and the development of visual skills to highest importance as they help teach, cue, and engage their athletes.

7. The Effect of Inclusive Physical Education and Wellness Programs on Children Without Disabilities

Children that do not have disabilities can learn much from teaching, coaching, and playing alongside individuals that do have disabilities. Infusing paralympic sports into a physical education curriculum can increase the awareness of the sociology of culture related to disability, history of sport participation of athletes with disabilities, and teach tolerance, patience and acceptance.

By creating inclusive sport programs for outside of school, such as an indoor cycling class that is open to all children, we create opportunity for children with autism to participate in organized physical activity alongside their peers. Here, sport serves as the great equalizer, leveling the playing field and placing students on even footing. The greatest educational effect is achieved when children train as a group or play the same sport together. Lev Belousov (2016) echoes, "Integrated sports activities involving both young able-bodied people and those with an impairment have an important educational effect on able-bodied youth" (Belousov, 2016, p. 48).

While outdoor cycling is slightly more difficult to modify in an effort to include all students, basketball can be tweaked in the everyday physical education curriculum so that wheelchair users can play alongside students who are running. Inclusive Zone Basketball (IZB) tweaks the basketball court and rules slightly, On both teams, there are two wheelchair users and two runners. Wheelchair users stay in the center zones of the court, while runners are restricted to the side alleys, which can be marked off with tape or plastic cones. If any player crosses their zone boundaries, there is a change in possession. Not only do the zones encourage teamwork, as players must pass the ball through each zone at least once before a basket is attempted, but they also serve as an important safety consideration throughout the game. An additional modification consideration is adding a lower hoop underneath the standard height hoop and designating separate point values per basket in each hoop (Inclusive Zone

Basketball, 2012). IZB allows wheelchair users and non-disabled students to develop basketball-specific skills while they simultaneously develop camaraderie and sportsmanship.

While creating programs that promote cross-ability interaction have many positive effects on those involved, designing the curriculum provides new challenges to the teachers and instructors. Educators can create a unit in the curriculum that focuses on a specific paralympic activity, such as wheelchair basketball or sitting volleyball, and encourage non-disabled students to play alongside their disabled peers. However, adults must be careful not to promote pity, misfortune, or a “superhero” attitude when including their students with disabilities. The goal of the unit should be on the experience of playing the sport and building relationships with other students (Lieberman, 2016, p. 4).

Whether it is an afterschool program or part of a new physical education curriculum, it is important to integrate organized adapted physical activity to better inform all students about the diversity that exists in the world. While barriers exist in the form of limited equipment and pushback from some students, the benefits of creating these programs trump the additional work required to successfully integrate them into the curriculum.

8. Conclusion and Reflection

Whether it be wheelchair basketball, an indoor spin class, or an outdoor bike ride, the goal of any organized physical activity for students with disabilities should be to instill a love for lifelong physical activity. Any and all of these programs should facilitate movement from one sport to another, or one aspect of a specific sport to another. This can include moving from wheelchair basketball to wheelchair cycling, or moving from participating in the sport competitively to taking on a role as coach, official, or mentor for other athletes (Wheelchair Basketball Canada, 2018). Ultimately, a positive experience in sport is key to retaining athletes and students. It is our responsibility as educators, coaches, and teachers to ensure that any student, disabled or non-disabled, has access to these reaffirming experiences.

My primary rationale for choosing this topic was my love and passion for sport and fitness. I decided towards the end of the 2017-18 school year that I would not return to the classroom in 2018-19. Rather, I chose to focus on finishing my master's degree and exploring what opportunities might exist in the fitness space. After a discussion with a close friend and mentor, I decided to focus the research of my integrated master's project on the creation of organized physical activities for children with disabilities as there could be future opportunity to apply this research towards forging a career path. Additionally, I enjoyed working closely with Sean O'Shea to create this independent study based off of the research conducted under his guidance during EDUC803 - Developmental Variations.

I was surprised by the amount of research I was able to uncover on the topic of sport and fitness for individuals with ASD. I was not concerned with uncovering research about wheelchair basketball, as it is a popular paralympic sports. However, I did not know what existed in regards to opportunities for children with autism. Fortunately, much literature exists on benefits of physical activity for all individuals, regardless of age or ability. One of the most difficult aspects of the project was narrowing down the research and choosing the articles that were most applicable to my topic. While I chose to primarily explore cycling and wheelchair basketball for students with ASD and physical disabilities respectively, I came across additional sources and organizations that sponsor events events such as marathons, triathlons, and other feats of endurance that encourage children with disabilities to participate.

While I have broadened my understanding of the topic in an effort to create a project large enough to satisfy the requirements for my integrated master's project, the next step is to put theory into practice. In New York City, I have reached out to startups such as Movement2Be in attempts to broaden their accessibility to make their programs more inclusive. The sheer number of barriers to participation for students with disabilities is alarming, particularly due to the vast health benefits of fitness programs and the rising costs of healthcare. Third party programs, such as Movement2Be, that push into schools during recess and after the school

day, have opportunity to go beyond the existing and regulated physical education curriculum as they are privately funded.

Finally, the social benefits of organized physical activity are as important as the physical benefits. Organized physical activities provide opportunity for students with disabilities to grow their confidence, socialize, and connect with their peers, both with and without disabilities. These activities and sports create a safe space where children can feel accepted and proud. As educators, fitness professionals, doctors, physical therapists and parents, it is our charge to ensure that fitness is accessible to all and that it plays an important role in our children's future and the continued design of new curricula and programs.

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