Program Development and Implementation: A Movement-Based Curriculum for Adults with Intellectual and Developmental Disabilities (IDD)

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Abstract

Adults with intellectual and developmental disabilities (IDD) face significant barriers to physical activity participation, including financial constraints, limited adaptive programs, and motivational challenges. Despite the well-documented benefits of physical activity on physical health, cognitive function, and social engagement, participation rates remain low. This capstone project aimed to design and evaluate a movement curriculum tailored to adults with IDD using the Person-Environment-Occupation-Performance (PEOP) model as a guiding framework. The curriculum incorporated evidence-based strategies, such as nature-based activities, dance, and team sports to promote meaningful engagement and sustained participation. Activities were structured to be adaptable based on individual abilities and environmental factors. The curriculum was implemented through site-specific protocols and facilitator collaboration, ensuring accessibility and long-term sustainability. Program effectiveness was evaluated through pre- and post-intervention surveys that analyzed participation using an adapted Likert scale as an outcome measure. Results demonstrated increased engagement in activities following the program implementation, suggesting that interventions incorporating social and environmental engagement resulted in improved sustained engagement compared to the previous exercise programs implemented at the facility. Future research should explore longitudinal outcomes within diverse community settings.

Keywords: Intellectual and Developmental Disabilities, Physical Activity, PEOP Model, Community-Based Interventions, Movement Curriculum, Social Engagement

Introduction

According to the Center for Disease Control and Prevention (CDC), 14% of adults in Indiana are living with cognitive disabilities (2023). This means that one in seven adults experiences difficulties with concentration, decision making, or other cognitive functions that can be classified as an intellectual or developmental disability (IDD). One critical health issue that individuals with IDD experience is decreased participation in physical activity (Ferreira et al., 2022). The CDC recommends that all adults, regardless of cognitive status, engage in at least 150 minutes of moderate activity a week in addition to two strength exercises (2022). However, adults with IDD have historically shown lower adherence to these physical activity guidelines. Research indicates only 13.5% of individuals with IDD meet the recommended activity levels, compared to 30.8% of the general population (Stancliffe and Anderson, 2017). This gap raises concern for a significant potential health disparity that requires attention.

Adults who do not meet physical activity guidelines often face higher rates of chronic illnesses, such as hypertension, metabolic syndrome, and obesity. These conditions not only reduce overall quality of life (QoL), but can also impair one's ability to complete their activities of daily living (ADLs) and live independently. Research suggests that individuals with IDD tend to have shorter lifespans due to comorbidities, with an average life expectancy to be 19 years shorter than the general population, largely due to comorbidities such as respiratory or cardiovascular related diseases (Lynch et al., 2022). These conditions may be prevented with appropriate physical activity measures in place, identifying a critical need for accessible and effective exercise programs for this population. The purpose of this Doctoral Capstone Experience (DCE) was to develop a functional movement curriculum for adults with IDD. Increased participation in movement activities was expected to improve health and wellness by

reducing the risk of chronic illnesses, enhancing physical fitness, and promoting overall well-being.

Needs Assessment

Needs Assessment Process

The needs assessment was conducted through a combination of interviews and a Qualtrics survey to gather both qualitative and quantitative data about the current physical activity status of Outside the Box (OTB) participants. In the initial meeting with the director of OTB she identified a significant gap in the incorporation of physical activity during the daily curriculum at both the Fishers and Indianapolis locations. The director shared that, while movement based activities are offered, participation is often low. This issue prompted further consideration into the barriers preventing overall engagement in physical activity.

To gather more information into the current state of the movement curriculum, a five question Qualtrics Survey was distributed to the Direct Support Professionals (DSPs) and facilitators, who run the movement program, at both OTB locations. The survey aimed to identify current participation rates, perceived barriers, and which activities were the most and least engaging for participants (Appendix B). Questions aimed to differentiate responses based on location (Indianapolis or Fishers), as each facility has different resources, impacting the feasibility of certain activities. The survey also sought to identify participation rates and gather subjective insights about why engagement may be low, as well as highlighting which activities engage participants the most and which struggle to maintain attention. Information gathered from both the interviews and surveys identified common themes that guided a movement curriculum to be developed to address these challenges.

Through surveys and interviews with group facilitators and DSPs, OTB had identified a lack of regular physical activity and exercise as a significant barrier in their curriculum. The program utilized nature walks and dance activities as a means for movement, but continued to struggle to keep participants engaged. Survey results indicated lack of engagement is primarily due to limited knowledge on exercise techniques, insufficient resources, and decreased participation (Appendix B). This was especially concerning given the higher prevalence of comorbidities in this population, including heart disease, respiratory issues, and hypertension (Ferreira et al., 2022). For adults with IDD, such as those at OTB, a functional movement curriculum focusing on increased participation could not only reduce the risk of chronic illnesses, but also improve overall health, wellness, and QoL.

Community and Site Profile

Outside the Box (OTB) is a day program within the Greater Indianapolis area centered towards supporting adults with IDD. They primarily serve individuals aged 18-40, with over 80% of participants living in Hamilton or Marion counties (Appendix A). OTB operates through two locations: Fishers and Indianapolis, each with unique resources that impact the types of physical activity allowed on site. The Indianapolis site, located between Binford Boulevard and 56th street, benefits from a larger outdoor space, including a wooded area with trails and a private backyard space equipped with garden beds and a swing set. This offers more opportunities for outdoor and nature based activities. Meanwhile, the Fishers site is located off 96th street near the interstate. It has access to a walking path behind the building, but no open outdoor areas for play. Noise pollution from the nearby freeway also limits the quality of outdoor participation when considering sensory processing differences. However, both locations have

access to a large indoor community room, which can be utilized for a variety of indoor games and activities.

Participants at OTB are divided into two categories: Style 1 and Style 2. The Style 1 group consists of individuals with a lower baseline level of functioning, while Style 2 includes those with higher functioning levels. Level of function is determined based on physical, verbal, and cognitive capabilities. The grouping system allows for participants to be peer matched with others of similar capabilities, ensuring that physical activities are appropriate and engaging for each group. Each group typically consists of 4-8 participants, with a staff to participant ratio of 1:4. This allows for adequate support and supervision to be provided to facilitate engagement in meaningful activities.

Initial Interview and Results Analysis

The initial interview with the director of OTB provided additional context about the current state of the facilities and challenges faced at both sites. During the interview, questions focused on the atmosphere at both locations, including resources and barriers arising when implementing physical activities (Appendix C). She identified that a lack of resources is a primary challenge in maintaining adequate participant engagement in physical activity. She noted that, while activities are offered, difficulties arise in grading each movement up and down towards the needs of each member. Additionally, DSPs expressed uncertainty with selection of activities and activity grading, leading to inconsistent physical activity throughout the program.

During the interview, the director suggested that a resource binder focused on a movement curriculum would be a valuable resource to staff and participants at OTB. This curriculum would be inclusive of activities tailored to each facility's resources and could be adapted by group style, indoor vs outdoor activities, and sensory needs. Currently, DSPs utilize a

collection of binders as part of their 'curriculum,' which includes objectives and weekly lesson plans. The director agreed that a binder would be beneficial as staff is already familiarized with this system. However, she emphasized it would need to be highly specific to accommodate for the diverse needs of the participants.

In addition to the interview insights, results of the initial Qualtrics Survey, completed by DSPs and group facilitators, revealed the average participation during physical activity was about 60%. However, participation varied significantly, with the lowest at 15% and the highest at 88% (Appendix B). A commonly identified barriers to participation in physical activities included generalized avolition, or lack of motivation. Activities identified as the most engaging tended to be social and competitive in nature, such as games and musical chairs. Meanwhile, ones with poor engagement included walking, chair exercises, and yoga.

Gap Analysis

Current State

OTB has identified a lack of movement in their participants during the daily curriculum to assist their participants in meeting CDC guidelines (Center for Disease and Control, 2022). While some movement activities are incorporated, such as bi-weekly walks, hallway games, and dancing videos, these activities are limited as most of the participants' routines are sedentary with minimal physical engagement. In an interview with the director, she shared that the majority of activities are done while seated, leading to concerns about the physical and social well-being of participants. She noted that while walking and dancing are appreciated, there is a clear need for an increased variety of movement opportunities. Both the initial interview and survey emphasized key barriers in engagement: low motivation, leading to low participation averaging

around 60% (Appendix B), and lack of knowledge on how to adapt movements towards each participant's needs.

Desired State

OTB aims to increase the physical activity of its participants by incorporating at least one movement activity into their daily curriculum. The desired outcome is to increase overall participation in these activities for improved overall function and QoL, as well as increased social engagement. OTB has expressed interest in implementing a variety of activities, including movement breaks, physical activity classes, and strategies to increase engagement in current movement activities. Their long-term goal is to create a comprehensive resource folder that includes a range of activities adaptable to each group and facility.

During the development of this movement curriculum, it is important to consider the unique amenities at both the Fishers and Indianapolis locations. These environmental factors affect the type of activity allowed. Additionally, OTB has emphasized the need for differentiation in activities to meet varying levels of functioning. The resource binder would not only offer activity suggestions, but also provide objectives, materials needed, steps to complete, discussion questions, and specific instructions on how to adapt each activity for specific needs of participants. This ensures that all individuals can participate meaningfully and safely during the movement curriculum.

Identified Gaps

The gap between OTB's current state and their desired state is primarily attributed towards limited resources, both in terms of time and knowledge, as well as environmental constraints. While OTB recognizes the importance of integrating more physical activity into their daily curriculum, they have been unable to implement a movement program that aligns best with

the recommended physical activity requirements for adults. Limited space, time, and knowledge combined with the diverse needs of their participants pose as primary barriers to inconsistent participation rates during the physical activity curriculum.

In addition to physical limitations, OTB faces financial constraints as they are a non-profit organization that relies heavily on donor funding. With a strict budget and no designated staff member to manage a movement curriculum, there is little room to develop or implement an effective physical activity program. This lack of resources directly affects their ability to implement a comprehensive and engaging program that would meet the needs of all participants.

OTB had also identified a lack of engagement in movement activities currently offered, such as dance breaks and walks. Despite these efforts, participation remains low, possibly due to the limited, repetitious activities that may not align with participants' interests. Best practice guidelines suggest that adults should be receiving at least 30 minutes of moderate physical activity a day, five days a week (Center for Disease Control and Prevention, 2022). However, OTB's previous program fell short of meeting this standard. Physical activity should be individualized, engaging, and adaptable to accommodate different abilities and preferences. Without a structured movement curriculum in place, OTB participants are subject to a greater risk of health disparities.

Literature Review

This literature review synthesizes current research on physical activity interventions and for adults with IDD, focusing on evidence-based movement strategies that can be implemented by OTB to address identified barriers. This review primarily includes articles published within the last five years that focus on adult populations with IDD. One study slightly exceeds the five

year limit but was included due to its publication in a highly credible peer reviewed journal. The first three levels of evidence have been included within this review, such as rapid systematic reviews, randomized controlled trials, meta-analyses, and mixed method intervention studies (Spalding University Library, 2024). All sources have been critically analyzed for credibility and validity to ensure the inclusion of high quality research. This review aims to synthesize physical activity intervention strategies for adults with IDD, with a focus on addressing the participation barriers identified in both research and by the community site. Based on this synthesis, effective physical activity interventions will be identified and tailored to create a movement curriculum for OTB participants.

Health Promotion and Quality of Life

A common theme in the literature reviewing the effects of physical activity based interventions for adults with IDD is the reduction of risks for developing comorbid disease and the potential improvement of overall QoL. Research suggests that increasing physical activity can also reduce prevalence in "problem behaviors" while increasing self-efficacy, confidence, and social participation (Simón-Siles et al., 2022). However, the literature on whether physical activity improves QoL appears inconclusive. Bondar and colleagues found no significant correlation between recreational and sports related physical activities and QoL or life satisfaction (2020). This may be due to the use of varying outcome measures to quantify QoL, as well as the varying definitions associated with the same. However, Scifo and colleagues found that participation in community based physical activity, such as team sports, can significantly increase QoL, social participation, feelings of connectedness, and life satisfaction for individuals with IDD (2019). These findings highlight the importance of using a more holistic and person centered approach that encompasses the social and emotional factors during physical activity.

This discrepancy in QoL as an outcome measure indicates a need for future studies to incorporate broader dimensions of QoL that may be more relevant to this population.

In terms of physical health, numerous studies have demonstrated the positive effects of physical activity interventions for individuals with IDD, such reductions in weight, body mass index (BMI), and visceral fat percentage. These improvements can decrease an individual's risk for developing chronic conditions such as diabetes, hypertension, and respiratory or cardiovascular diseases (Bondar et al., 2020). Similarly, Scifo (2019) and colleagues reported improvements with general health including increased bone metabolism, enhanced respiratory function, and improved cardiovascular function following consistent physical activity. Additionally, physical activity has a positive impact on cognitive function through increased blood flow, which supports synaptogenesis in the brain which directly affects processing speed, attention, and memory (Scifo et al., 2019). This biological mechanism is particularly relevant for individuals with IDD, who often experience difficulties with these cognitive functions.

Missing the Mark and Key Barriers

The current exercise recommendations for all adults, regardless of cognitive status, suggest 150 minutes of moderate physical activity a week; however, up to 83% of adults with IDD are not meeting this recommendation (Hassan et al., 2018). Several studies have examined the barriers preventing this population from meeting these recommendations and proposed strategies to address these gaps. For example, Ferreira et. al (2022) identified financial constraints and the lack of adaptive physical activity programs as a key barrier to participation. Similarly, Scifo and colleagues (2019) suggest that barriers such as comorbid health conditions, difficulties with functional mobility, and lack of environmental resources may prevent individuals with IDD from engaging in physical activity. Both studies highlight monetary factors

as major social-economic influencers of physical activity participation for adults with IDD. While Scifo and colleagues identify that another factor to poor participation can be attributed to decreased motivation due to differences with the reward pathway in the brain (2019), Ferriera and colleagues fail to address psychological and social barriers to physical activity. While these barriers are frequently cited in the literature, there is limited discussion of how community based interventions can be adapted to address these issues in a financially sustainable way.

Guidelines for Developing a Physical Activity Curriculum

Nature based interventions (NBIs) have been shown to alleviate symptoms of depression and anxiety in autistic adults, directly impacting their QoL (Dennis et al., 2024). Participants in NBIs groups exhibited greater positive behavioral changes when compared to the placebo groups, highlighting the mental health benefits of nature engagement. Gardening, for example, is a low intensity physical activity that can facilitate independence in activities of daily living and social participation. It provides a relaxed environment where individuals with IDD can experience physical activities while engaging with others (Dennis et al., 2024). This aligns with the goals of increasing social connectedness during physical activity. Similarly, Scifo and colleagues emphasized the importance of physical activity interventions to be enjoyable and social in nature, such as sport intervention programs (SIPs) that include group based enduring training, walking, swimming, and aerobic exercise programs (2019). By incorporating inclusive sports and nature interventions that foster social connectedness, participants would be more motivated to participate in physical activity, leading towards sustained health improvements long-term.

Effective physical activity interventions do not have to be limited to nature or sport based; for example, dancing as exercise is also another appropriate option. Dance is classified as

an aerobic exercise, requiring coordination and motor planning skills, which can be beneficial for individuals with IDD. Although the study size was small (n=30), a 12-week dance program led to significant decrease in weight, BMI, and overall cardiovascular fitness (Martinez et al., 2019). This program achieved one of the highest participation rates (90%) compared to other intervention styles, likely due to its group based nature and flexibility for individualization. Similar to NBIs and SIPs, literature suggests that participation in physical activity interventions can be maximized with activities that promote social connectedness. The high participation rate seen in this study reinforces the importance of integrating social elements into physical activity interventions to increase motivation and ensure long-term adherence.

While physical activity has been shown to improve physical well-being in individuals with IDD, such as reducing risks of chronic conditions, the health disparity arises in overall engagement and sustained participation. Programs that are not individualized and socially engaging often fail to foster lasting behavior change. For example, a 12-week walking program for adults with IDD resulted in positive physical outcomes but showed a negative correlation with life satisfaction and subjective health outcomes for individuals with Autism and other emotional-behavioral conditions (Selanon and Chuagchai, 2023). Similarly, resistance training programs resulted in improvements with physical health but showed limited long-term engagement and minimal sustained changes in behavior following the program's conclusion (Hassan et al., 2019). These findings suggest that while such programs may produce physical health benefits, they lack the motivation and enjoyment needed for continued participation. In contrast, interventions that incorporate social interaction and encompass a client-centered approach, such as NBIs and SIPs, lead to better engagement and sustainability as they address both social and physical needs of individuals.

Health promotion interventions can be physical or educational; however, research suggests that solely educational programs may not be effective in creating long lasting behavioral changes in individuals with IDDs. For example, a 12 week health program designed to teach the importance of physical exercise and its integration into daily life resulted in minimal to no change in adherence to physical activity recommendations (Hassan et al., 2018). This highlights the primary barrier to longevity of physical activity programs as education alone fails to address social, motivational, and emotional factors that influence long-term behavioral change. In contrast, interventions that incorporate caregivers or peer support can increase self-efficacy and confidence during physical activity through feedback, which has been shown to improve adherence (Bondar et al., 2020). This suggests that educational interventions, when combined with the integration of peer or caregiver support, can aid in improving outcomes and encouraging sustainability of exercise programs for adults with IDD.

The highlighted research suggests that successful physical activity interventions for adults with IDD are those that are socially engaging, client-centered, and easily adapted to individual needs. Nature-based interventions, inclusive sports, dance programs, and peer-supported games tend to result in higher levels of participation and sustainability due to their focus on enjoyment, social connection, and overall motivation. In contrast, programs that are purely educational and lacking personalization tend to have limited long-term sustainability and overall participation. These findings emphasize the importance of designing movement-based curriculum that prioritizes not only physical outcomes, but also the social and emotional aspects involved. This evidence-based approach informed the development of the curriculum and guided decisions related to activity selection, structure, and implementation.

Guidelines for Developing Outcome Measures

Self-report questionnaires are a commonly used outcome measure to measure health promotion and participation. However, creating an accessible questionnaire is important for obtaining accurate results. One resource states that adding visuals, using simplified language, and adding definitions for difficult terms can increase health literacy and comprehension (Nicolaidis et al., 2020). Additionally, individuals with Autism and IDD may struggle with retrospective reflection; therefore, the survey design will encourage timely responses to maintain the validity of the survey data. This consideration is necessary when creating an outcome measure as the goal is for the results to be identified with the most accurate results.

The Pittsburg Participation Scale (PPS) is a Likert Scale tool utilized to assess patient participation levels during therapy sessions. It demonstrated an excellent interrater reliability (ICC = 0.91-0.96), confirming its consistency and accuracy in measuring participation (Shirley Ryan AbilityLab, 2013). The Likert scale format is accessible towards a wide range of participants (18-65+) and does not require any specialized training to be completed (Shirley Ryan AbilityLab, 2013. Given this data, a Likert scale similar to the PPS has been adapted to cater towards group participation during physical activity (Appendix D) rather than individualized participation during a rehabilitation session.

Theoretical Foundations

The Person-Environment-Occupation-Performance (PEOP) Model is a framework that examines the relationship between four key domains: The person, environment, occupation, and performance. The *person* encompasses both intrinsic and extrinsic factors that influence an individual's performance during daily activities. These factors include cognitive, physical, and social abilities, as well as any strengths or limitations that affect their participation in occupations. The *environment* refers to the context and dynamic of a person's surroundings,

which directly influences what activities they can complete. The environment involves physical space, social support, culture, and access to resources. The *occupation* domain focuses on the activity itself, including specific tasks and skills required for successful participation. Finally, *performance* reflects the individual's overall participation in the activity, or the quality of its completion (Bass et al., 2024). Each of these domains are interrelated, an imbalance in one can impact the outcomes of others.

The development and implementation of the movement curriculum was based on the theoretical framework of the PEOP model, ensuring a holistic consideration of each domain. In pre-surveys, facilitators identified a lack of motivation, which is an intrinsic factor, as a common barrier to participation in movement activities. In response, the curriculum was designed with respect to differing cognitive, social, and physical capabilities of participants. This includes specific guidelines for adapting each activity for various ability levels. Additionally, the environment of each site influenced each protocol, such as the resources available, physical space, and the abilities of the facilitators to ensure that each protocol would be contextually appropriate. The occupation, which is physical activity in this case, was broken down into detailed, step-by-step instructions to facilitate a thorough task analysis. This structured approach was intended to enhance occupational performance. By adjusting the domains of the person, environment, and occupation, the curriculum aims to improve overall participation during movement activities.

Project Plan and Process

Goals

The following goals were developed prior to on-site work, informed by evidence-based literature and collaboration between the student, faculty mentor, capstone coordinator, program

director of research, and the capstone site. Creation of the movement curriculum is classified under the ACOTE focus area of program development (Occupational Therapy Doctoral Capstone, 2022). All of these factors guided the formation of the goals and objectives to ensure the curriculum is evidence based, client centered, and designed to maximize meaningful engagement in activities.

Project Goal 1: The student will develop an occupation-based curriculum to facilitate increased participation and engagement in movement-based activities among OTB participants.

Objective 1: The student will collect data utilizing Qualtrics surveys and observation regarding experiences, strengths, and challenges of social participation during movement activities for OTB members.

Objective 2: The student will incorporate member input to create a meaningful and evidence-based movement curriculum involving activities that promote social participation.

Project Goal 2: The student will collaborate with OTB employees and volunteers regarding the use and implementation of the program designed to ensure proper sustainability of curriculum for existing and new OTB employees and volunteers.

Objective 1: The student will develop evidence-based tools regarding movement programs for each location, with activities graded for different participants' needs.

Objective 2: The student will educate and collaborate with DSPs and other members of the OTB team to ensure best fit and confidence during program implementation.

Objective 3: The student will design accessible physical and digital locations of the movement curriculum to be easily retrieved and utilized by stakeholders.

Project Goal 3: The student will evaluate effectiveness of the movement curriculum in promoting participation and engagement among OTB participants.

Objective 1: The student will utilize both qualitative and quantitative data to assess program outcomes.

Objective 2: The student will analyze feedback from facilitators, administration, and participants to guide future recommendations and curriculum refinement.

Processes

The overarching capstone plan was to develop a movement curriculum centered around the diverse needs of OTB participants with the main outcome to increase overall participation during physical activity. To fulfill this objective, the process included a literature review, needs assessment, and gap analysis to identify main barriers and needs. Following those steps, an Institutional Review Board (IRB) approved the capstone experience and allowed for data collection to be conducted via Qualtrics surveys. Results of these surveys analyzed previous processes and participation levels during movement activities at OTB. Throughout the capstone experience, the student gathered qualitative data through the collaboration with DSPs and OTB participants daily, periodically met with the Director of OTB, and participated in online educational prompts led by the faculty mentor to help guide the process.

Doctoral Capstone Project Timeline

The timeline was constructed and divided into five structured phases: Program preparation, program development, program refinement, program implementation, and program

longevity. Each portion of the timeline ensured a systematic and organized approach to achieving the project's goals. Table 1 outlines a more detailed description of each phase.

Table 1

Project Timeline

Phase	Description
Phase 1: Project Preparation Weeks 1-2	Familiarization of self with capstone site and key stakeholders. Development and distribution of Likert scale outcome measure. Development of movement curriculum protocol/outline.
Phase 2: Program Development Weeks 2-6	Administration and review pre-assessment surveys with DSPs. Observation and collaboration with groups during movement activities. Formation of movement protocols with activities based on different group needs, including methods for grading activities up and down.
Phase 3: Program Refinement Weeks 6-10	Implementation of movement protocols on a partial scale. Continued collaboration with DSPs for program adaptations and improvements.
Phase 4: Program Implementation Weeks 10-12	Total implementation of movement curriculum across both sites. Administration and review of post-assessment surveys with DSPs. Continued adaptations as needs arose.
Phase 5: Ensuring Program Longevity Weeks 12-14	Finalized the accessibility formats of movement curriculum in both printed binder and online databases. Continued collaboration with OTB stakeholders to ensure confidence in continuing the program.

Curriculum Development

Participants

Individuals involved in the program development of the movement curriculum included DSPs, or group facilitators, at both OTB locations. While the curriculum was created to benefit the OTB participants, to ensure ethical compliance with IRB protocols, the DSPs completed the surveys. These assessments informed the development of the primary outcome measure: observed group participation and engagement. For additional details on OTB participant demographic information, please see Appendix A.

A total of 25 DSPs contributed to the capstone experience by providing insight and feedback centered around group engagement during movement activities. The group facilitators varied in race, gender, age, and ethnicity; however, all DSPs were over the age of eighteen. These professionals had diverse levels of experience working with adults with IDD, and played an important role adapting and implementing movement protocols based on participant needs. While the OTB participants were the intended beneficiaries, their engagement and responses during activities indirectly shaped the curriculum through DSP feedback.

Development Procedure

Within the first two weeks of the DCE, the student collaborated with the Executive Director of OTB to ensure the movement curriculum aligned with the structure and flow of the current OTB curriculum. This resulted in the development of a movement protocol outline, which is detailed in Appendix E. Each activity protocol was designed to target social, cognitive, and physical objectives, which reflect the key themes identified in the literature review. These themes were prioritized to maximize participation and engagement. This protocol outline was instrumental in ensuring the curriculum could be easily implemented, adaptable, and beneficial for all participants, regardless of individual abilities.

The development of each protocol also considered important factors, such as the available environment in which the activity was taking place, resources, and the abilities of both the group facilitators and participants. All necessary materials for each activity were listed clearly in its own section to ensure accessibility and preparedness. Additionally, each activity protocol included detailed instructions for facilitators, along with specific guidelines on how to grade the activity to accommodate for varying levels of participant ability. These graded modifications allowed for the activity to be adjusted in difficulty depending on the needs of the group. To support inclusive participation, activity accommodations were categorized into sensory, physical, social, and cognitive aspects to ensure individuals with different abilities could fully engage in each activity.

Curriculum Implementation and Refinement

Throughout the development of the movement curriculum, activities were created through close collaboration with DSPs to ensure they met the needs and abilities of the participants. A key component of the program was through the establishment of an "Athletics Club," which took place every Monday and Friday for one hour. During each session, participants began with chair aerobic exercises. The initial site survey, prior to the start of the DCE, identified chair exercises as a physical activity movement with good participation (See Appendix B). By Week 6 of the DCE, these exercises were followed by a structured activity protocol tailored to physical, cognitive, and social needs of the group.

To promote sustainability, the DSPs were responsible for selecting and leading activities during each session. However, the capstone student remained on-site to provide support, answer any questions, and offer clarification as needed. Activity protocols were organized in a binder, divided by Style group and categorized into indoor and outdoor activities, allowing for easy

access and reference by the DSPs. Following each activity, the capstone student and group facilitator engaged in a brief discussion to identify perceived barriers. This ongoing feedback allowed the protocols to be further refined and adapted to better meet OTB's needs.

During Week 7, the project underwent refinement based on feedback from the Executive Director of OTB. Her input prompted adjustments to the curriculum, including the incorporation of more activities designed specifically for Style 1 groups, or lower-functioning participants. This refinement aimed to better align the movement protocols with the diverse abilities of all participants to ensure that the program was accessible to everyone, and help close the gap of the health disparity identified earlier. The ongoing collaboration with the DSPs and the Executive Director was essential in making these modifications to ensure OTB's needs were met and improve the overall effectiveness of the curriculum.

The final revisions based on the feedback provided in Week 7 allowed for the movement curriculum to be completed and ready for implementation by week 10 of the DCE. During weeks 10-12, group facilitators implemented and adapted the curriculum with the capstone student present to provide support and address questions throughout the process. In week 11, the post-survey QR code was distributed for facilitators to record participation levels and gather outcome data.

Evaluation Plan

Data Collection and Analysis

Outcome measures were collected using Qualtrics surveys completed by the DSPs following any movement activity to assess group participation and engagement. Facilitators were informed to complete the baseline survey immediately after completing a movement activity in January 2025. As previously mentioned, the preliminary and post-implementation surveys were

constructed using a Likert Scale adapted from the PPS to evaluate group participation during movement activities (Shirley Ryan AbilityLab, 2013). These response options included Poor (1), Fair (2), Good (3), Very Good (4), and Excellent (5), providing a quantitative measure of observed group participation. Further details on scoring considerations can be found in Appendix D. Survey data were exported into an Excel spreadsheet for analysis, allowing for identification of trends and graphical representation of findings to evaluate statistical significance and program effectiveness.

Results

DSPs reported the overall participation during physical activity of the groups they led before and after implementing the movement curriculum. The mean participation score increased from 2.0 (SD = 0.71) pre-intervention to 3.8 (SD = 0.79) post-intervention, reflecting a substantial increase in participant engagement. As seen in Table 2, an unpaired two-tailed t-test revealed a statistically significant difference between preliminary and post-intervention survey scores ($p < 0.001$), indicating improved participation following implementation of the movement curriculum. The effect size, measured by Cohen's d, was 2.4, indicating a large and meaningful difference in participation scores when comparing the pre- and post-intervention groups.

Table 2

Comparative Analysis of Pre- and Post-Intervention Data

Rating (Likert Scale)	Pre-Intervention (n=9)	Post-Intervention (n=10)
1 (Poor)	1	0
2 (Fair)	5	0
3 (Good)	2	4
4 (Very Good)	1	4

5 (Excellent)	0	2
Mean	2.0	3.8
Standard Deviation	0.71	0.79
	Cohen's *d* = 2.4	***p* = 0.0001**

Discussion

This capstone experience aimed to develop and implement a movement curriculum for adults with IDD that was inclusive, adaptable, and sustainable. The curriculum addressed common barriers to participation, such as poor motivation, lack of accessibility based on individual needs, and environmental constraints. Overall, the results of this project support existing literature suggesting that interventions that are client-centered and socially engaging in nature are more effective in sustaining engagement compared to traditional exercise programs (Selanon and Chuagchai, 2023**).** Consistent with previous studies, activities that incorporated social interaction, such as team-based games, were more successful in maintaining participant engagement compared to traditional exercise approaches, such as chair aerobics. The evaluation of the program not only supports prior research, but also highlights the value of collaborative, client-centered curriculum design in promoting meaningful group participation for adults with IDD.

Capstone Impact

This capstone project made a meaningful contribution to both the OTB community and the broader field of occupational therapy by demonstrating the impact of a structured, client-centered movement curriculum tailored for adults with IDD. The results of this project, particularly the increase in participant engagement post-intervention, highlight the effectiveness of client-centered, socially engaging activities in promoting sustained involvement. With a

statistically significant improvement in participation, as indicated by the mean increase from 2.0 to 3.8 and a large effect size (Cohen's $d = 2.4$), the curriculum demonstrated its capacity to enhance meaningful engagement among participants during movement activities. This outcome aligns with prior research outlined in the literature review that suggests socially interactive and adaptable programs are more effective than traditional exercises approaches.

The results of this DCE have significant implications for future programming as the project not only addressed gaps in inclusive movement programming, but also provided a practical model that can be adapted across similar community-based organizations. The positive impact on participation suggests that similar programs could be integrated into community organizations supporting adults with IDD. The findings reinforce that a focus on inclusive, collaborative, and adaptable movement programs can continue to enhance engagement, making a lasting impact for individuals with IDD.

Sustainability Plan

To ensure the longevity of the movement curriculum, the project incorporated a sustainability plan that included the development of accessible, easy to follow activity protocols in both a physical binder and an online database available to all OTB staff. This approach facilitates ongoing use and allows the program to be expanded as needed. The collaboration between the student, staff, and participants fostered a sense of empowerment, enhancing both the immediate success and long-term potential of the curriculum. By providing protocols in both formats, the curriculum ensures continued support for staff and participants beyond the duration of the capstone. These strategies reinforce the program's sustainability, making it possible to continue positive impacts achieved throughout the project.

Connection to Project Goals

The ongoing development of the movement curriculum was directly aligned with the overarching goals of the project. Specifically, *Project Goal 1* aimed to develop a movement curriculum to increase participation and engagement during physical activities for OTB participants. The establishment of the activity protocols during Athletics club was a key step in addressing this goal. By offering a structured, yet flexible program that allowed for graded activities based on participant ability, the curriculum was designed to encourage meaningful participation across a wide range of physical, cognitive, and social abilities.

Additionally, *Project Goal 2* focused on collaboration with OTB staff to ensure successful implementation. By actively engaging DSPs in the selection and leadership of activities, the project ensured that the curriculum would be sustainable and relevant to the needs of both the staff and participants. The student's role in providing ongoing support and adapting activities during implementation contributed to the successful collaboration between the student, DSPs, Executive Director, and the participants. Additionally, sustainability was supported through the organization of activity protocols in a clear and accessible binder. This approach aligns with the existing curriculum system that OTB uses for other areas of interest. Protocol outlines and activities were imported onto an online database accessible to all OTB. This ensured the longevity of the program after the capstone project concluded.

Finally, *Project Goal 3* involved evaluating the effectiveness of the curriculum in promoting engagement and participation. Data collection occurred through observation, staff feedback, and survey responses. This allowed for continuous adjustments during the curriculum development, ensuring the curriculum was responsive to participant needs and aligned with evidence-based practices. Through these efforts, the project fulfilled its primary objectives to

improve participant engagement, promote collaborative implementation, and assess program outcomes to ensure long-term success.

Limitations

Adequate data collection was limited primarily due to a small sample size of DSPs willing to complete surveys. Additionally, ethical compliance constraints prevented the collection of identifiable participant data, limiting the direct insight into individual engagement patterns. Observer bias may have influenced results, as participants could have been more inclined to engage in activity with an unfamiliar observer present during activities. While the Likert Scale was based on the PPS, a validated and reliable outcome measure, modifications were made to align with group participation during activities. These alterations may have affected the overall reliability and validity of the measure.

Conclusion

This doctoral capstone experience successfully developed, implemented, and evaluated a movement curriculum designed to increase participation in physical activity among adults with intellectual and developmental disabilities (IDD). Grounded in the PEOP model, the project addressed key barriers such as limited accessibility, poor motivation, and environmental constraints through client-centered, adaptable, and socially engaging activities that prioritized physical movement. Results demonstrated a significantly significant increase in participation, reinforcing the effectiveness of a holistic, inclusive program design. The curriculum's sustainability was supported through accessible resources, staff interaction, and integration into existing organizational structures. By bridging the gap between evidence-based research and practical application, this project contributes a model for community-based physical activity programs, promoting long term health and well-being for adults with IDD.

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Table 1

Outside the Box Participant Demographics

Appendix A. Figure 1

GENDER

	COUNT	PERCENTAGE
Female	93	34.40%
Male	88	32.60%
Not Specified	89	33.00%

ETHNICITY

	COUNT	PERCENTAGE
Arab American	1	0.40%
Asian	2	0.70%
Black/African American	33	12.20%
Do not wish to provide	3	1.10%
Hispanic/Latino	1	0.40%
Not Specified	129	47.80%
Other	2	0.70%
two or more races	4	1.50%
White/Caucasian	95	35.20%

AGE GROUP

	COUNT	PERCENTAGE
0 - 5	0	0.00%
6 - 17	6	2.20%
18 - 40	188	69.60%
41 - 65	58	21.50%
66 - 85	11	4.10%
> 86	0	0.00%
Not Specified	7	2.60%

COUNTY

	COUNT	PERCENTAGE
Bartholomew	1	0.40%
Boone	1	0.40%
Hamilton	68	25.20%
Hancock	3	1.10%
Hendricks	1	0.40%
Johnson	2	0.70%
Marion	176	65.20%
Not Specified	18	6.70%

SERVICES

	COUNT	PERCENTAGE
Employment Services	20	7.78%
Fishers Day Program	42	16.34%
Indy Day Program	195	75.88%

FUNDING SOURCE

	COUNT	PERCENTAGE
Family Supports Waiver	174	51.63%
Community Integration and Habitation	134	39.76%
Private Pay	2	0.59%
No Funding Source	27	8.01%

Appendix B

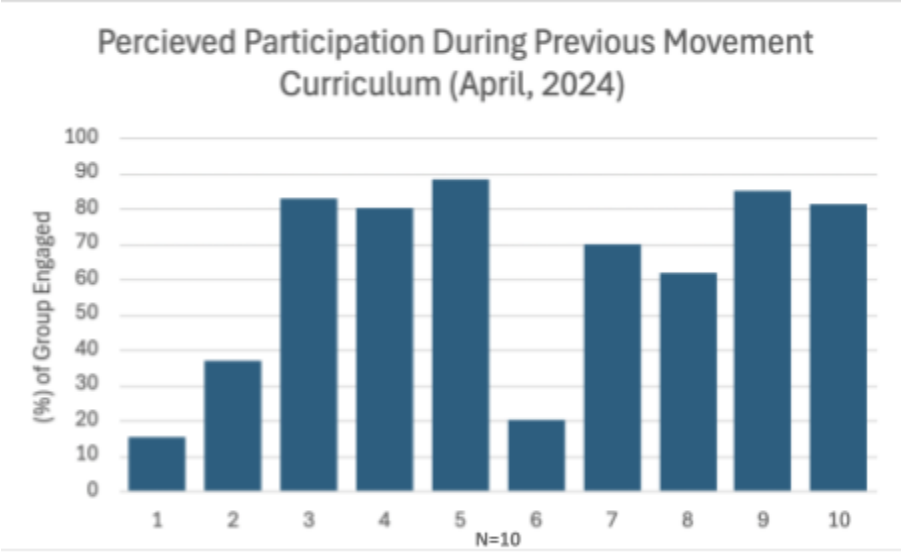
Initial Site Survey Results (April, 2024)

Appendix B. Table 1

Qualtrics Survey Questions

1. What site is your primary location?
2. When doing activities that include a lot of movement, what percent of your participants do you feel participate?
3. What do you feel is the biggest barrier to decreased participation?
4. What activities have the most participation?
5. What activities have the least participation?

Appendix B. Figure 1



Appendix B. Table 2

Primary Site	Perceived Biggest Barrier to Poor Participation	Activities with the Most Participation	Activities with the Least Participation
Indy[1]	Level of understanding in an activity, needing 1:1 attention to complete activity including movement activities.	Activities with routines/ rolling on the floor with blankets	Curriculum
Indy	Their willingness to do it.	Not sure	Not Sure
Indy	Desire	Walking	Outdoor sports
Indy	Some participants aren't as active in their everyday life/run out of breath easily when doing physical activity.	Walking Club	Musical chairs
Indy	Participants not encouraged by staff to participate because staff are not motivated to participate	Games, dodgeball, musical chairs, yoga	Activities outside or done in smaller groups
Indy	Some are style one	Chair exercises	Walking
Indy	Lack of wanting to have body movement.	Athletics club	N/A
Indy	Participants not wanting to walk or move	Outings	Outside activities involving walking
Fishers	Lack of interest or differences in mobility	Zumba	Chair exercises
Indy	Not wanting to do the activity	Dodgeball, chair exercises	Yoga

[1] Indy refers to Indianapolis, IN

Appendix C

Site Interview Questions

1. What are you unable to offer right now that you wish you were able to?
    a. What are the barriers to this?
2. Are there any specific topics or challenges you want me to address through my capstone work?
    a. Why did you choose these challenges?
    b. What have you done already to address these challenges, what has worked and what has not worked?
3. Who are the key stakeholders for Outside the Box?
4. What does a typical day look like for you? For the participants of the program?
    a. What is the atmosphere or energy of the program?
5. Describe your average clientele.
6. What kind of supervision or support would you be willing to provide for me?
    a. How would we plan to discuss progress, goals, and needs?
7. Would you be interested in continuing the capstone ideas once my semester is over?

Appendix D

Qualtrics Preliminary and Post-Intervention Survey

Questions:
Today's Date
Group Name

1. Today's Movement Activity
2. Please select a category based on observation from the group as a whole. In cases of doubt, choose the lower rating. The Grading Scale is as Follows:
    a. Poor: Participants refused or did not participate in at least half of session.
    b. Fair: Participants participated in most or all of activity, but did not show maximal effort or finish most activities, or required much encouragement to finish activities
    c. Good: Participants participated in all activity with good effort and finished most but not all of the activity and passively followed directions (rather than actively taking interest in activities).
    d. Very Good: Participants participated in all activity with maximal effort and finished all, but passively followed directions (rather than actively taking interest in activity).
    e. Excellent: Participants participated in all activities with maximal effort, finished all activity, and actively took interest in activity and/or future sessions.
3. Please provide feedback on what you feel went well or what you feel could have gone better, thank you!

Appendix D. Figure 1

Preliminary Participation Data

Date	Group Name	Movement Activity	Participation Score
1/20	The Explorers Grou	Just dance	2: Fair
1/20	Wizards	Just Dance	3: Good
1/21	Jedi	Hallway stretching	2: Fair
1/26	Dinos	Yoga	1: Poor
1/16	Oaks	Walk	2: Fair
1/20	Chargers	Hallway bowling	3: Good
1/24	Fishers groups	Dance party	2: Fair
1/24	Athletics club	Chair exercises	4: Very Good
1/31	Athletics club	Musical chairs	2: Fair

Appendix D. Figure 2

Post-Intervention Participation Data

Date	Group Name	Movement Activity	Participation Score
4/8	Leapords	Team led stretching	4: Very Good
4/8	Waves	Flip cup tik tac toe	5: Excellent
4/8	Athletics club	Chair exercises	3: Good
4/9	Majestic oaks	Nature walk	3: Good
4/9	Chargers	Hallway bowling	4: Very Good
4/10	Dinos	Cosmic yoga	3: Good
4/11	Waves	Human tik tac toe	5: Excellent
4/18	Athletics club	Chair exercises	3: Good
4/18	Waves	Ball table roll	4: Very Good
4/18	Chargers	Darts	4: Very Good

Appendix E

Movement Protocol Outline

Appendix E. Figure 1.