



OTÁVIO LUIS PIVA DA CUNHA FURTADO

PHYSICAL ACTIVITY INTERVENTIONS FOR CHILDREN AND YOUTH WITH VISUAL
IMPAIRMENT

INTERVENÇÕES COM ATIVIDADES FÍSICAS PARA CRIANÇAS E ADOLESCENTES
COM DEFICIÊNCIA VISUAL

CAMPINAS
2015



UNIVERSIDADE ESTADUAL DE CAMPINAS
FACULDADE DE EDUCAÇÃO FÍSICA

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Dissertation presented to the College
of Physical Education of the University of
Campinas in partial fulfillment of the requirements
for the degree of Doctor in Physical Education, in
the area of Adapted Physical Activity

Tese apresentada à Faculdade de Educação Física da
Universidade Estadual de Campinas como parte dos
requisitos exigidos para a obtenção do título de
Doutor em Educação Física, na Área de Atividade
Física Adaptada

Supervisor: Prof. Dr. Gustavo Luis Gutierrez

ESTE EXEMPLAR CORRESPONDE À VERSÃO
FINAL DA TESE DEFENDIDA PELO ALUNO
OTÁVIO LUIS PIVA DA CUNHA FURTADO E
ORIENTADA PELO PROF. DR. GUSTAVO LUIS
GUTIERREZ

A handwritten signature in dark ink, appearing to read "Gutierrez", is written over a horizontal line. The signature is stylized and includes a long horizontal stroke extending to the right.

CAMPINAS
2015

Ficha catalográfica
Universidade Estadual de Campinas
Biblioteca da Faculdade de Educação Física
Dulce Inês Leocádio dos Santos Augusto - CRB 8/4991

F984p Furtado, Otávio Luis Piva da Cunha, 1977-
Physical activity interventions for children and youth with visual impairment /
Otávio Luis Piva da Cunha Furtado. – Campinas, SP : [s.n.], 2015.

Orientador: Gustavo Luis Gutierrez.
Tese (doutorado) – Universidade Estadual de Campinas, Faculdade de
Educação Física.

1. Deficientes visuais. 2. Atividade física. 3. Criança. 4. Adolescentes. I.
Gutierrez, Gustavo Luis. II. Universidade Estadual de Campinas. Faculdade de
Educação Física. III. Título.

Informações para Biblioteca Digital

Título em outro idioma: Intervenções com atividades físicas para crianças e adolescentes com deficiência visual

Palavras-chave em inglês:

Visual impairment

Physical activity

Children

Adolescents

Área de concentração: Atividade Física Adaptada

Titulação: Doutor em Educação Física

Banca examinadora:

Gustavo Luis Gutierrez [Orientador]

Lauren Joy Lieberman

Edison Duarte

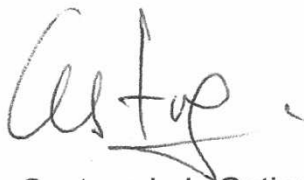
Márcio Pereira Morato

Mey de Abreu Van Munster

Data de defesa: 13-05-2015

Programa de Pós-Graduação: Educação Física

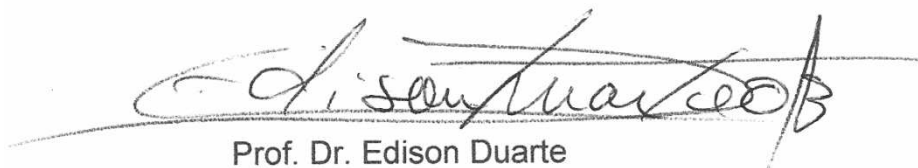
COMISSÃO EXAMINADORA:



Prof. Dr. Gustavo Luis Gutierrez
Orientador



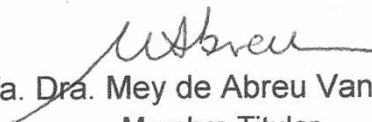
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ABSTRACT

In this Dissertation we investigated physical activity interventions for children and youth with visual impairment (VI). The work is structured in a three-paper format and also includes introduction and final consideration sections. The first paper presents a systematic review, designed to synthesize the available literature on physical activity-related interventions for children and youth with VI. The following articles are based on a qualitative research design (case studies), aiming to explore the content of questionnaires, documents, and interviews performed with seven adapted physical education faculty members who run Camp Abilities (CA), a sport camp for children and youth with VI. Therefore, in the second paper we described the characteristics of camps, and its participants, while in the third paper, we analyzed the outcomes of running the mentioned camp on faculty members' teaching, research, and service roles.

RESUMO

Na presente tese de doutorado investigamos intervenções com atividades físicas para crianças e adolescentes com deficiência visual (DV). A tese contém três artigos científicos, além de capítulos de introdução e considerações finais. No primeiro artigo, a partir de uma revisão de literatura apresentamos a síntese de intervenções relacionadas à prática de atividades físicas para crianças e adolescentes com DV. Os dois artigos seguintes baseiam-se em pesquisa qualitativa (estudo de caso) e exploram o conteúdo de entrevistas semiestruturadas envolvendo sete professores de ensino superior que tem em comum o fato de ministrarem a disciplina Educação Física Adaptada e dirigirem um *Camp Abilities, sport camp* para jovens com DV. No segundo artigo descrevemos as características dos camps e de seus participantes. No terceiro artigo analisamos a influência dos *sport camps* na carreira destes profissionais.

Table of Contents

Introduction	1
Physical Activity Interventions for Children and Youth With Visual Impairments: A Systematic Review	3
Introduction.....	4
Method.....	5
Eligibility criteria	5
Inclusion criteria.	6
Exclusion criteria	7
Information Sources	7
Search Strategy.....	8
Data Collection Process.....	8
Risk of Bias Within Studies	8
Results.....	9
Study Selection.....	9
Study Characteristics.....	11
Structured exercise training	11
Leisure-time physical activity.....	13
Instructional strategy.....	14
Risk of Bias Within Studies	22
Discussion.....	22
Findings on groups of interventions.....	23
Risk of bias within studies.....	26
Strengths and limitations	27
Directions for future research.....	28
Conclusion	28
The Characteristics of Camp Abilities, a Sport Summer Camp for Children and Youth with Visual Impairment: A Multiple Case Study Approach.....	30
Introduction.....	31
Methods	32

Case Study Design.....	32
Sample Selection	33
Data Collection.....	33
Questionnaire	33
Semi-structured interviews.	34
Document analysis.	34
Data Analysis	34
Trustworthiness	35
Results and Discussion	37
The People.....	37
Directors.....	37
Directors’ responsibilities.....	37
Shared responsibilities	37
Campers	38
Coaches	39
Coaches training	39
Specialist.....	40
The Camps.....	40
Camp Abilities purposes	40
Sports and physical activities.....	41
Changes.....	42
Funding	43
Conclusions.....	44
The Impact of Running a Sport Camp for Children and Youth with Visual Impairments on Faculty Members’ Teaching, Research, and Service	46
Introduction.....	47
Methods	50
Case Study Design.....	50
Sample Selection	50
Data Collection.....	51
Questionnaire.	51

Semi-structured interviews.....	51
Document analysis	53
Data Analysis	53
Trustworthiness	54
Results.....	55
Teaching	55
Research	57
Service	59
Discussion.....	61
Conclusions.....	66
Final Considerations	67
References	69
Appendix	80

List of Figures

Figure 1. Results of the literature search.....	10
Figure 2. Visual representation of the theme teaching.....	55
Figure 3. Visual representation of the theme research.....	58
Figure 4. Visual representation of the theme service.....	60

List of Tables

Table 1. Study Characteristics: Structured Exercise Training.....	15
Table 2. Study Characteristics: Leisure-time Physical Activity.....	17
Table 3. Study Characteristics: Instructional Strategy.....	19
Table 4. Modified Downs and Black Scale.....	21
Table 5. Camps Abilities Characteristics.....	36
Table 6. Participants Characteristics.....	52

Introduction

There is increasing evidence that higher levels of physical activity provide psychosocial and physiological health benefits to most people (Biddle & Asare, 2011; Strong et al., 2005). Unfortunately, many children and youth are not engaging in enough daily moderate-to-vigorous physical activity, as recommended by the World Health Organization (WHO), to reap the expected benefits (WHO, 2010). In particular, those with visual impairment (VI) are even less active (Kozub & Oh, 2004; Houwen, Hartman, & Visscher, 2009), and present lower levels of physical fitness (Lieberman & McHugh, 2001) when compared to their sighted peers.

Considered to be a major health issue, VI affects many life domains, independent of age. A global estimate of the number of people with VI indicates that approximately 1% of the population from zero to 14 years of age have at least a moderate level of VI, and a tenth of these have total blindness (Pascolini & Mariotti, 2012). Although historically underserved, this group have received growing attention from researchers, and in the last few years several physical activity-related intervention have been developed and published in the scientific literature. We considered that the synthesis of these studies and associated programs are warranted and has the potential to shed light on relevant information for multiple audiences.

Fortunately, during our PhD internship in the State University of New York - The College at Brockport (2013-14), we had the opportunity to address these issues. Thus, we design three research projects seeking to:

- Synthesize the available literature on physical activity-related interventions for children and youth with VI;
- Describe the characteristics of Camp Abilities (CA);
- Explore the impact of running a CA on adapted physical activity faculty members' roles.

Accordingly, the present Dissertation is structured in a three-paper format. The first one, a systematic literature review, addressed the available physical activity interventions for children and youth with VI. Five databases were searched to identify studies involving the population of interest and physical activity practices. After evaluating a total of 2495 records, 18 original full text studies, published in English were considered eligible. We identified eight structured exercise training studies which yielded overall positive effect on physical fitness and motor skill outcomes. Five leisure-time physical activity and five instructional strategy interventions were also found with promising proposals to engage and instruct children and youth with VI to lead an active lifestyle. In this review, we also discussed the positive and negative aspects of each intervention, and delineated directions for future research. This article has been published in the journal *Adapted Physical Activity Quarterly*, Volume 32, Issue 2, April.

The following articles are based on a qualitative research design (case studies), aiming to analyze the content of questionnaire (see Appendix A) and interviews (see Appendix B) performed with seven adapted physical education faculty members who run CA, a sport camp for children and youth with VI. Additionally, we also explored respective faculty members' Camp and University website documents. Before starting the data collection process, all participants answered to our invitation letter (see Appendix C), and signed an informed consent (see Appendix D), approved by the College at Brockport Institutional Review Board (see Appendix E).

Then, in the second paper we described the characteristics of camps and its participants, while in the third paper, we analyzed the impact of running a CA on faculty members' roles.

Physical Activity Interventions for Children and Youth With Visual Impairments: A Systematic Review*

Abstract

The authors conducted a systematic literature review on physical activity interventions for children and youth with visual impairment (VI). Five databases were searched to identify studies involving the population of interest and physical activity practices. After evaluating 2,495 records, the authors found 18 original full-text studies published in English they considered eligible. They identified 8 structured exercise-training studies that yielded overall positive effect on physical-fitness and motor-skill outcomes. Five leisure-time-physical-activity and 5 instructional strategy interventions were also found with promising proposals to engage and instruct children and youth with VI to lead an active lifestyle. However, the current research on physical activity interventions for children and youth with VI is still limited by an absence of high-quality research designs, low sample sizes, use of nonvalidated outcome measures, and lack of generalizability, which need to be addressed in future studies.

Keywords: child, adolescent, blindness, low vision, systematic review

* Furtado, O. L. P. C., Allums-Featherston, K., Lieberman, L. J., & Gutierrez, G. L. (2015). Physical activity interventions for children and youth with visual impairments. APAQ, 32(2). <http://dx.doi.org/10.1123/APAQ.2014-0164>

Introduction

There is increasing evidence that higher levels of physical activity provide psychosocial and physiological health benefits for children and youth (Biddle & Asare, 2011; Strong et al., 2005). To enhance physical fitness and overall health within this group, the World Health Organization (WHO) has recommended the accumulation of at least 60 minutes of moderate-to-vigorous physical activity (MVPA) daily (WHO, 2010). However, many children and youth are not meeting this recommendation, and in particular those with VI. Considered to be a major health issue, VI affects many life domains, independent of age. Although unequally distributed, a global estimate of the number of people with VI indicates that approximately 1% of the population from zero to 14 years of age have at least a moderate level of VI, and a tenth of these have total blindness (Pascolini & Mariotti, 2012).

Some studies have demonstrated that children and youth with VI engage in less than 30 minutes per day of MVPA. For instance, Kozub and Oh (2004) showed that a sample of 19 students between the ages of 6 to 18 years with different levels of VI spent on average fewer than 28 minutes a day in MVPA. Similarly, Houwen, Hartman, and Visscher (2009) have documented even lower levels of daily MVPA ($18.4 \text{ min} \cdot \text{d}^{-1}$) in a group of 48 children with low vision (6 to 12 years). When considering the participation in leisure-time physical activity (LTPA) children with VI were involved in fewer activities, at a lower intensity, and a higher frequency of activities performed at home, in comparison to their sighted peers (Engel-Yeger & Hamed-Daher, 2013).

In consequence to the reduced engagement in physical activities, children and youth with VI tend to have lower levels of health-related physical fitness (Lieberman, Byrne, Mattern, Watt, & Fernández-Vivó, 2010; Lieberman & McHugh, 2001) as well as motor skills when compared to their same-age peers (Houwen, Hartman, et al., 2009; Wagner, Haibach, & Lieberman, 2013). In a recent review Shields, Synnot and Barr (2012) presented a number of barriers (e.g., personal,

social, environmental, and policy and programme) to physical activity for children and youth with disabilities, which added to the inherent visual impairment-related limitations, reduce the opportunities for those with VI, and help to understand their limited engagement in physical activities.

Based on previous literature reviews, there have been a few research studies evaluating physical activity interventions for children and youth with VI (Depauw, 1981; Houwen, Visscher, Lemmink, & Hartman, 2009; Skaggs & Hopper, 1996). However, in the last years several investigations on structured exercise training (SET), LTPA, and instructional strategies (IS) for this group have become available. Thus, the analysis and synthesis of these studies are warranted and has the potential to shed light on relevant physical activity-related information. Therefore, we conducted a systematic review to synthesize the available literature on physical activity-related interventions for children and youth with VI. More specifically, we sought to review the published literature on SET, LTPA and IS interventions for children and youth with VI.

Method

The present review was designed in accordance with the preferred reporting items for systematic reviews and meta-analyses (PRISMA; Liberati et al., 2009) and the Cochrane handbook for systematic reviews of interventions (Higgins, 2008).

Eligibility criteria

The term VI used in this review was based on the category H54 (categories 1 to 5) of the International Classification of Diseases (*ICD-10*) update and revision 2013 (WHO, 2013). As a broad concept VI refers to limited vision in the better eye with presenting correction (eyeglasses, contact lens). The classification of VI provided by the *ICD-10* are based on the assessment of visual acuity (VA) and visual field (VF) and can be categorized in the following categories:

- Moderate VI (category 1) - VA of 6/18 to 6/60.

- Severe VI (category 2) - VA of 6/60 to 3/60.
- Blindness (categories 3 to 5) – VA of 3/60 to no light perception or VF no greater than 10° in radius around central fixation.

Another VI classification system relates specifically to sport and has been widely used in sport science literature. This classification is divided into three classes: B1 - no light perception in either eye up to light perception, but inability to recognize the shape of a hand at any distance or in any direction; B2 - from the ability to recognize the shape of a hand up to VA of 2/60 and/or a VF of less than 5 degrees in the best eye with presenting correction; B3 - from VA above 2/60 up to 6/60 and/or a VF of less than 20 degrees (USABA, 2014). More recently this classification has been updated and adopted the use of logarithm of the minimum angle of resolution (logMAR) VA measurement and new VF limits (IBSA, 2014). It is also important to recognize that some professionals, while not using any of the mentioned sport VI classification systems, still differentiate athletes with VI by their ability to run safely or unsafely without a guide. In this study the terms moderate and severe VI (WHO, 2013), B2 and B3 (USABA, 2014), are used as synonyms for low vision.

Inclusion criteria. To be included in this review studies needed to present participants' VI classification according to the *ICD* system, USABA, IBSA or the ability to run with or without a guide. Exceptions were accepted for cases in which the study had deafblind participants in less than 20% of the total and included a sign language interpreter. We included studies examining physical activity interventions with children (3 to 12 years) and or youth (13 and 18 years) with VI. Exceptions were made when any of the participants were older than 18 years. In this situation the inclusion was limited to studies with the group's mean age below 18 years and no participant older than 23 years.

To be included in our synthesis articles should have physical activity interventions such as SET, LTPA or IS. The term SET meant any intervention in which participants were involved in planned and supervised exercise programs, with pre and post assessment, and duration of at least 6 weeks with at least two sessions per week or a minimum of 30 hours of training for programs with consecutive days. LTPA was here defined as any unstructured physical activity, performed in situations such as recess and after school time periods. The term IS was characterized as any approach to facilitate learning or skill development, which could in turn be beneficial to promote physical activity engagement in SET or LTPA. Studies were included irrespective of outcomes assessed, however, studies had to be written in the English language, and published in peer reviewed journals, in dissertations or as a full-article conference proceedings.

Exclusion criteria. Research including individuals with an intellectual disability, physical disability or any other sensory disabilities were not consider for analysis. We excluded studies addressing orientation and mobility interventions, and those that had only abstracts available or were unpublished reports, as they usually provide incomplete or unreliable information.

Information Sources

We identified studies by searching the electronic databases PubMed, Scopus, Eric and ProQuest Dissertations and Theses Database with no date limit. Keywords used were: (1) VI or visually impaired or low vision or blindness; (2) child or children or adolescent or youth; (3) physical activity or instruction strategy or physical education or exercise or sport or movement or performance or motor skill. These groups were combined with the operator “and” to provide an optimal search.

Relevant articles from article and review reference lists not obtained from the main search were included in the present study (Depauw, 1981; Houwen, Visscher, et al., 2009; Skaggs &

Hopper, 1996). Citing articles of included papers were also searched in Google Scholar. The search was completed on the second week of May 2014.

Search Strategy

Relevant titles were inserted in a Reference Manager program. After excluding duplicates, we proceeded with the selection on titles, followed by abstracts and then on full texts. An inclusion form was developed for the purpose of this review; pilot tested by the first and second authors; and refined before each selection phase. The two authors independently screened the studies for eligibility and disagreements about inclusions were resolved by discussion. If there was any doubt on title and abstract eligibility the full text was selected to be screened as proposed by Higgins (2008).

Data Collection Process

A data extraction form was also created and pilot tested. Part of the extracted data originated from the full text eligibility assessment (participants, settings, intervention details, and outcome measurements). Further information included in the table of contents (purpose and results) were extracted by the first author and checked by the second author. Both reviewers also extracted key conclusions of the study authors, miscellaneous comments from the study authors and miscellaneous comments by the review authors. Disagreements were resolved by discussion between the two review authors. We contacted two authors for desired information, but none responded. Missing information is presented in the table of contents with “ ? ”. Meta-analysis of studies was not performed because of the heterogeneity of the included research.

Risk of Bias Within Studies

Risk of bias was assessed using the Downs and Black checklist (Downs & Black, 1998). The original instrument consists of 27 items and five subscale; however, the checklist was adapted based on items relevance to this review. The new version included 10 items addressing reporting

(5), external validity (2), internal validity (2), and power (1). Based on Hinckson and Curtis (2013), each study received a generic score according to the percentage of yes (1) and no (0), and a qualitative descriptor: Bad = 0 to 20%; Poor = 21 to 40%; Fair = 41 to 60%; Good = 61 to 80%; Excellent = 81 to 100%. The first and second authors pilot-tested 3 selected articles and then independently appraised the risk of bias of each article. When disagreements occurred, consensus was achieved through discussion.

Results

Study Selection

The initial literature search generated a total of 2948 citations involving physical activity interventions for children and youth with VI. Seven records were identified by checking the references of relevant papers and studies that had cited these papers. Following screening of titles and abstracts, 27 publications were retained to view full text. Of these, nine were excluded: four because full text was not available, four were not interventions and one due to participant age limit. A total of 18 studies were identified for inclusion in our review (Figure 1).

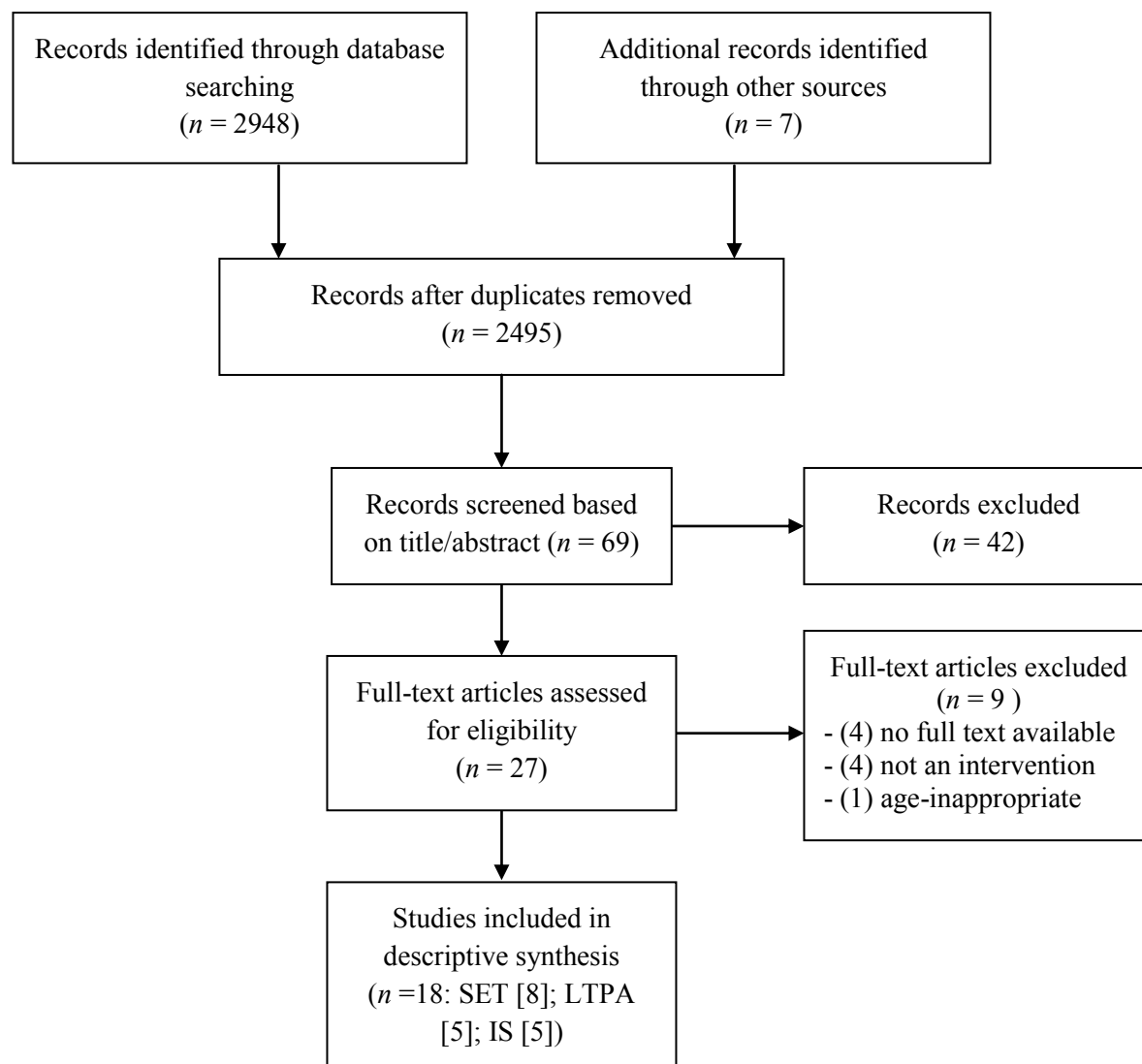


Figure 1. Results of the literature search. IS: instructional strategy; LTPA: leisure time physical activity; SET: structured exercise training

Study Characteristics

All 18 full text studies included in this review were written in English and published as original research: 13 in peer reviewed journal articles, three as dissertations (Fernandez-Vivo, 2002; Joseph, 1984; Palazesi, 1986), and two in conference proceedings (Morelli, Foley, Columna, Lieberman, & Folmer, 2010; Morelli, Foley, Lieberman, & Folmer, 2011). Among the material selected, eight of them (Table 1) were classified as SET (Aki, Atasavun, Turan, & Kayihan, 2007; Caliskan et al., 2011; Chen & Lin, 2011; Hashemi, Dehghani, Saboonchi, & Roozbahani, 2012; Jazi, Purrajabi, Movahedi, & Jalali, 2012; Mavrovouniotis et al., 2013; Ponchillia, Armbruster, & Wiebold, 2005; Shindo, Kumagai, & Tanaka, 1987), five (Table 2) as LTPA (Boffoli, Foley, Gasperetti, Yang, & Lieberman, 2011; Cervantes & Porretta, 2013; Morelli et al., 2010; Morelli et al., 2011; Robinson & Lieberman, 2007), and five (Table 3) as IS (Fernandez-Vivo, 2002; Joseph, 1984; Lieberman, Butcher, & Moak, 2001; Palazesi, 1986; Wiskochil, Lieberman, Houston-Wilson, & Petersen, 2007).

Structured exercise training. Participants' age within the SET studies ranged from 8 to 22 years old. Although the focus of the review was on the age of 3 to 18, studies with participants older than 18 years were not excluded as long as the mean age of the sample was below 18 years. Sample size ranged from 10 to 321 participants, involving a total of 486 participants. The majority of studies included boys and girls with low vision in the same group. Articles were published from 1987 to 2013 with seven of them being published in the last 8 years. They were developed in six different countries (Iran=2; Turkey=2; Greece=1; Japan=1; Taiwan=1; USA=1) mostly in schools for people with VI.

Interventions lasted from 6 to 12 weeks with frequency of two to three times per week and duration of 50 to 90 minutes, ranging from a total of 12 to 54 hours of training. One study had one week of consecutive training days with a total of 30 hours of training (Ponchillia et al., 2005). The

mode of training included: motor skill training (Aki et al., 2007); goalball and movement education (Caliskan et al., 2011); rope jumping training (Chen & Lin, 2011); gymnastics skill program (Hashemi et al., 2012); balance exercises (Jazi et al., 2012); Greek traditional dances, Pilates and PE classes (Mavrovouniotis et al., 2013); sports education program (Ponchillia et al., 2005); and bicycle ergometers (Shindo et al., 1987). All studies provided comprehensive explanation of training programs, except for two studies with none (Caliskan et al., 2011) or little (Ponchillia et al., 2005) program detail. Electronic correspondence was sent to the primary author in order to obtain further explanation regarding goalball and movement education training protocols.

Different protocols were used to measure the impact of training programs. Physical fitness was the most common measurement used (Chen & Lin, 2011; Hashemi et al., 2012; Ponchillia et al., 2005; Shindo et al., 1987), with test batteries that included a combination of aerobic capacity, strength, endurance, balance, flexibility or body composition tests. Motor skills were assessed in two studies (Aki et al., 2007; Mavrovouniotis et al., 2013) with the Bruininks-Oseretsky test of motor proficiency - short form, versions one and two. Mavrovouniotis et al. (2013) also assessed motor skills using the Movement Assessment Battery for Children - second edition (MABC-2). Jazi et al. (2012) assessed balance among children with low vision using the modified Bass test of dynamic balance. Body mass index (BMI) and body fat percentage (BFP) were used to assess body composition by Caliskan et al. (2011). An interview was conducted to evaluate attitudes and sports knowledge of sport camp participants (Ponchillia et al., 2005). The Cornell Medical Index was employed to determine physical and psychic symptoms (Shindo et al., 1987).

Three out of the eight SET studies had a control group (Chen & Lin, 2011; Hashemi et al., 2012; Jazi et al., 2012). Study results demonstrated statistical effect of training in all tests when

compared to controls, except for the rope jumping training (Chen & Lin, 2011) which showed statistical significance for sit-and-reach and PACER tests, but not for BMI or the sit-up test.

Studies without control groups presented the benefits of training by comparing pre and post intervention scores, except for the Physical Education training group (Mavrovouniotis et al., 2013) that showed no statistical difference between tests. When comparisons were made between different training protocols within a study, differences were found in favor of school training groups compared to home training groups in balance, bilateral coordination, upper limb coordination, response speed, and visual motor control tests (Aki et al., 2007) and in the reduction of BFP in girls who practiced goalball compared to a movement education group (Caliskan et al., 2011).

Leisure-time physical activity. Participants' age in the five LTPA studies ranged from 9 to 23 years old. Sample size ranged from four to 13 participants, involving a total of 54 participants. All studies included boys and girls and had samples with participants who were blind, low vision, or blind and low vision. All studies were developed in the USA from 2007 to 2013, and implemented mostly in a sport camp setting.

Interventions with strategies to foster the engagement in LTPA lasted from 2 days to 5 weeks. Accelerometers were the most common measure employed, although activity logs, interview, and enjoyment scale were also used. Adapted exergames interventions demonstrated that children with VI achieved moderate levels of physical activity while having fun (Boffoli et al., 2011; Morelli et al., 2010; Morelli et al., 2011). A social cognitive theory-based intervention was successful in enhancing physical activity levels of youth with VI and also promoted positive changes in selected social cognitive constructs (Cervantes & Porretta, 2013). A parent resource manual was aimed to influence the physical activity levels of boys and girls with VI; however, conclusive effects could

not be established (Robinson & Lieberman, 2007). All studies provided comprehensive explanation of interventions.

Instructional strategy. Participants' age in the five IS ranged from 3 to 21 years old. Sample size ranged from four to 50 participants, involving a total of 85 participants. All studies included boys and girls and in most cases had only participants who were blind or had low vision. Two articles were published in the 1980's and three in the 2000's. They were developed only in the USA and mostly in regular school settings.

Interventions lasted from 1 day to 13 weeks. Two studies used the academic learning time in PE protocol (ALT-PE) to evaluate the effect of a peer tutor program and found that motor appropriate levels significantly improved (Fernandez-Vivo, 2002) and led to a mean increase of 20% (Wiskochil et al., 2007) due to the intervention. Joseph (1984) assessed the effect of augmented verbal information feedback on dart throw performance and, although no statistical effect of intervention was found, authors concluded that knowledge of result associated with knowledge of performance yielded the highest scores when compared to each treatment alone or when no verbal information was provided. The guide wire was the safest and best running technique chosen by boys and girls in a questionnaire-based evaluation (Lieberman et al., 2001).

A movement intervention curriculum was assessed by a movement in space behavior recording form, which found no clear effect of intervention on participants' behavior; however, trends emerged with reduction in some static behaviors, increases in some dynamic behaviors, reduction of assisted movements, and slight increases in locomotion through space (Palazesi, 1986). All studies provided comprehensive explanation of programs.

Table 1. *Study Characteristics: Structured Exercise Training*

Id, Design and Quality	Participants and Setting	Intervention	Outcome measures	Result
Aki et al. (2007) <u>Case-series</u> D&B: Fair	40 participants with severe low vision: school training group (10M and 10F; mean age 8:9 year:month) and home training group (10M and 10F; mean age 8:10 year:month). <u>Primary School for the Blind, Turkey.</u>	Motor training program: 3 months; 3 sessions per week; 60 minutes per session.	Bruininks-Oseretsky Motor Proficiency Test-Short Form.	Significant post-training increases in all subtests, except in visual motor control for home group. Differences between groups were found in favor to school training group (balance, bilateral coordination, upper limb coordination, response speed, and visual motor control).
Caliskan et al. (2011) <u>Case-series</u> D&B: Fair	46 participants with severe VI: goalball group ($n = 22$; 12M and 10F) and movement education group ($n = 24$; 14M and 10F); ages 10-15. <u>Turkan Sabancı Disabled Children School, Turkey.</u>	Goalball and movement education training: 3 months; 3 sessions per week; 90 minutes per session.	BMI; BFP.	Significant post-training increases in BMI and BFP for goalball group. Only BFP was reduced in the movement education group. Higher reduction of BFP were found for girls in goalball group.
Chen & Lin (2011) <u>Randomized controlled trial</u> D&B: Poor	16 youth with VI: experimental group ($n = 8$) and control group ($n = 8$); ages 15-17; no VI classification available. <u>Taichung School for the Blind, Taiwan.</u>	Rope jumping exercise: 10 weeks; 3 sessions per week; 50 minutes per session.	BMI; Sit-and-reach; Sit-up; PACER.	Significant post-training increases in the sit-and-reach and aerobic capacity (PACER) tests.
Hashemi et al. (2012) <u>Randomized controlled trial</u> D&B: Fair	20 girls classified as B2: experimental group ($n = 10$, mean age 9.2 years) or control group ($n = 10$, mean age 10.4 years). <u>School for blind children, Iran</u>	Gymnastic skill program: 12 weeks; 2 sessions per week; 60 minutes per session.	Motoric module test.	Only experimental group showed significant post-training increases in all tests.

Table 1. (continued)

Id, Design and Quality	Participants and Setting	Intervention	Outcome measures	Result
Jazi et al. (2012) <u>Randomized controlled trial</u> D&B: Good	19 participants with VA worst than 6/18, no blind: balance-training ($n = 9$; 7M and 2F) and control group ($n = 10$; 5M and 5F); ages 8-14. <u>School of students with VI. Iran</u>	Balance training: 8 weeks; 2 sessions per week; 60 minutes per session	Modified Bass Test of Dynamic Balance.	Only experimental group showed significant post-training increases in all tests.
Mavrovouniotis et al. (2013) <u>Case-series</u> D&B: Fair	14 participants who were blind: experimental group ($n = 9$; M? and F?; mean age 15.7) or PE classes ($n = 5$; M? and F?; mean age 16.40). <u>Music High School and Lyceum. Greece.</u>	Experimental group with Greek dances/Pilates, and PE class group: 8 weeks; 2 sessions per week; 45 minutes per session.	Movement Assessment Battery for Children – 2 ^o ed; Bruininks-Oseretsky Test of Motor Proficiency-2 Short Form.	Significant post-training increases were found in the experimental group for three tasks of static balance and four tasks of dynamic balance. No differences in the PE group.
Ponchillia et al. (2005) <u>Case-series</u> D&B: Poor	321 participants classified as their ability to run without a guide: run-unsafe: 32.2% (2001), 31% (2002); run-safe: 67.8% (2001), 69% (2002); 176M and 145F; ages 8-19. <u>Western Michigan University. USA.</u>	Sports education camp: 1 week; ~30 hours of instruction in clinics and competition. Specific activities for 8-12 or 13-19 years old students groups.	Underhand and overhand softball throws; standing long jump; Sports Camp Evaluation Instrument.	Post-camp scores were statistically different in underhand/overhand throws, and standing long jump. Participants also showed significant growth in attitudes, and sport knowledge.
Shindo et al. (1987) <u>Case-series</u> D&B: Good	10 males (4 totally blind; 6 semi-blind (VA < 1/60); ages 16-22. <u>School for visually handicapped persons in the city of Fukuoka. Japan.</u>	Bicycle ergometers - mild intensity: 6 weeks; 3 sessions per week; 60 minutes per session.	VO ₂ max, pedaling speed and power, maximal stepping; isometric strength; skinfold; CMI.	CMI improved in all participants. VO ₂ max significantly increased by 18%. Skinfold thickness at the waist reduced significantly.

BFP: body fat percentage; BMI: body mass index; BPM: beats per minute; D&B: Adapted Downs and Black checklist descriptor; F: female; M: male; PACER: progressive aerobic cardiovascular endurance run; PE: physical education; VA: visual acuity; VI: visual impairment.

Table 2. *Study Characteristics: Leisure-time Physical Activity*

Id, Design and Quality	Participants and Setting	Intervention detail	Outcome measures	Result
Boffoli et al. (2011) <u>Single-subject design</u> D&B: Good	12 participants classified as B2 or B3; 7M and 5F; ages 9-16. <u>College of Brockport in New York. USA.</u>	Participants played 10 minutes each of Dance Dance Revolution Extreme 2, EyeToy Kinetic, and Wii Boxing. Games were project on a large screen.	PACES.	Participants enjoyed being physically active through the use of these exergames. No difference on the PACES was found between games.
Cervantes & Porretta (2013) <u>Single-subject design</u> D&B: Good	Four participants (two B1; one B3; one B4); 3M and 1F; ages 14-19. <u>Residential school for the blind/VI. USA.</u>	Social Cognitive Theory (SCT) - based intervention to increase the duration of daily after-school leisure time physical activity: nine lessons - 5 weeks; 2 sessions per week; 30 to 45 minutes.	Accelerometer; Activity logs; Social cognitive constructs (questionnaires).	Moderate functional control over participants' time spent in a bout of leisure time physical activity. Physical activity was enhanced only when the intervention was in operation. Positive changes were found on social cognitive constructs.
Morelli et al. (2010) <u>Single-subject design</u> D&B: Good	13 participants classified as B1; 9M and 4F; mean age 12.6. <u>College of Brockport in New York. USA.</u>	Participants played 10 minutes each of two versions of a VI Tennis exergame. One version had audio/tactile cues and the other had tactile cues turned off.	Accelerometer; Interviews.	Children achieved moderate to vigorous levels of physical activity. No significant difference in energy expenditure was found between versions, though children scored significantly better with the audio/tactile version and also enjoyed playing this version more.

Table 2. (continued)

Id, Design and Quality	Participants and Setting	Intervention detail	Outcome measures	Result
Morelli et al. (2011) <u>Single-subject design</u> D&B: Fair	12 participants classified as B1; 8M and 4F; mean age 12.2. <u>College of Brockport in New York. USA.</u>	Participants played 10 minutes of the exergame Pet-N-Punch using both arms and using only the dominant arm.	Accelerometer; Heart rate monitor; PACES.	Children achieved light to moderate physical activity levels in either situations. High scores in the PACES indicated strong interest in playing the game. No significant difference in energy expenditure was detected between versions, while the two arm version had a significantly higher error rate.
Robinson & Lieberman (2007) <u>Single-subject design</u> D&B: Good	13 participants classified as B1, B2 or B3, 2 were deafblind; 11M and 7F; ages 9-23. <u>College of Brockport in New York. USA.</u>	Resource manual designed to assist families in improving their children's participation in physical activity: 1 week activity duration.	Activity Log.	No clear effect on physical activity levels of participants was found.

D&B: Adapted Downs and Black checklist descriptor; F: female; M: male; PACES: physical activity enjoyment scale; SCT: social cognitive theory; VI: visual impairment.

Table 3. *Study Characteristics: Instructional Strategy*

Id, Design and Quality	Participants and Setting	Intervention detail	Outcome measures	Result
Fernandez-Vivo (2002) <u>Single-subject design</u> D&B: Good	Nine participants from first to third. Three low vision (1M and 2F) and 6 sighted peers (3 highly skilled, and 3 low skilled); ages 6-8.; number of trained tutors (unclear). <u>Elementary inclusive school. USA.</u>	Peer tutoring program. Teachers trained tutors (sighted peer) in two meetings of 10 to 15 minutes each. Intervention lasted 20-25 PE classes (5-8 baseline; 2 tutor's training; 7 intervention; 5-8 baseline).	ALT-PE; Interview with teachers.	Significant difference between levels of motor appropriate among the students (high skilled, low skilled, and students with VI) and demonstrated that the motor appropriate interval changed significantly across program phases.
Joseph (1984) <u>Single-subject design</u> D&B: Good	50 participants who were blind to 3 verbal information feedback treatment groups: 18 to knowledge of performance (KP); 16 to knowledge of results (KR); 16 to KP + KR; 22M and 28F; ages 7-21. <u>Three Schools for the blind. USA.</u>	Velcro dart throw with augmented verbal information feedback. Day one: 3 learning sessions with 30 throws each verbal information (KP or KR; or KP + KR). Day two: retention session with 30 throws without verbal information.	Pre and post Scores from throwing the dart at the target.	KR + KP yielded the highest treatment mean (4.65), followed by KP (4.37) and KR (3.96). However, the difference between treatments was not significant.
Lieberman et al. (2001) <u>Single-subject design</u> D&B: Fair	22 participants who were blind; M9 and F13; ages 10-20. <u>College of Brockport in New York. USA.</u>	Guiding technique. Children experienced 4 running techniques and indicated the preferred running mode: sighted caller; tether; guide wire; sighted guide.	Questionnaire.	Guide wire as the safest (45%) and best technique (50%). Males found the guide wire the safest (67%) while the tether the best technique (44%). Females found the sighted guide the safest (67%) while the guide wire the best technique (44%).

Table 3. (continued)

Id, Design and Quality	Participants and Setting	Intervention detail	Outcome measures	Result
Palazesi (1986) <u>Single-subject design</u> D&B: Good	Four children with VI (VA of 6/60 to light perception); 3M and 1F; ages 3-7. <u>Regular school. USA.</u>	During 13 weeks children participated in a movement intervention consisting of 2 treatments: 1) listening activity sessions and verbal prompting to encourage movement; 2) movement activity sessions with verbal prompts that faded over time.	Movement in space behavior recording form was used with a momentary time sampling technique to record behaviors (static and dynamic).	No clear effect of intervention was found. However, a trend began to emerge with the reduction of some static behaviors, increase of some dynamic behaviors, reduction of assisted movements, and increase of locomotion through space.
Wiskochil et al. (2007) <u>Single-subject design</u> D&B: Good	Four students with VI (2 blind; 2 low vision); 2M and 2F; 12-20 sighted peers (4 reference, 8-16 trained tutors); 3rd grade to 11th grade. <u>Regular school. USA.</u>	Peer tutoring program. Tutor's training (same age peers) lasted 1.5 to 2 hours. Intervention lasted 10-14 PE classes (4-6 baseline; 6-8 intervention).	Modified version of ALT-PE.	Intervention resulted in a mean increase of 20.8% for ALT-PE and increases in ALT-PE scores for closed and open skills. Trained peer tutors were more effective than were untrained peer tutors.

ALT: academic learning time; D&B: Adapted Downs and Black checklist descriptor; F: female; KP: knowledge of performance; KR: knowledge of results; M: male; PE: physical education; VA: visual acuity; VI: visual impairment.

Table 4. *Modified Downs and Black Scale*

		Reporting					External validity		Internal validity		Power	Score (%)	Descriptor
		1	2	3	4	5	6	7	8	9	10		
SET	Aki et al. (2007)	1	1	1	1	1	0	0	1	0	0	60	Fair
	Caliskan et al. (2011)	1	1	0	0	1	0	0	1	1	0	50	Fair
	Chen & Lin (2011)	0	1	0	1	1	0	0	1	0	0	40	Poor
	Hashemi et al. (2012)	0	1	1	1	1	0	0	1	0	0	50	Fair
	Jazi et al. (2012)	1	1	1	1	1	0	1	1	1	0	80	Good
	Mavrovouniotis et al. (2013)	1	1	0	1	0	0	1	1	0	0	50	Fair
	Ponchillia et al. (2005)	0	0	0	0	1	1	1	1	0	0	40	Poor
	Shindo et al. (1987)	1	1	1	1	1	0	0	1	1	0	70	Good
LTPA	Boffoli et al. (2011)	1	1	1	1	1	0	1	1	0	0	70	Good
	Cervantes & Porretta (2013)	1	1	1	1	1	0	1	1	1	0	80	Good
	Morelli et al. (2010)	1	1	1	1	1	0	1	1	0	0	70	Good
	Morelli et al. (2011)	1	0	1	1	1	0	1	1	0	0	60	Fair
	Robinson & Lieberman (2007)	1	1	1	1	0	0	1	1	1	0	70	Good
IS	Fernandez-Vivo (2002)	1	1	1	1	1	0	1	1	1	0	80	Good
	Joseph (1984)	1	1	0	1	1	1	1	1	1	0	80	Good
	Lieberman et al. (2001)	1	1	0	1	0	0	1	1	0	0	50	Fair
	Palazesi (1986)	1	1	1	1	1	0	1	1	1	0	80	Good
	Wiskochil et al. (2007)	1	1	0	1	1	0	1	1	1	0	70	Good

IS: instructional strategy; LTPA: leisure time physical activity; SET: structured exercise training; 1: Clear hypothesis/aim/objective; 2: Clear main outcomes; 3: Clear participant characteristics; 4: Clear intervention description; 5: Clear description of main findings; 6: Representative sample; 7: Representative staff, places, and facilities; 8: Appropriate statistical test; 9: Valid and reliable outcome measures; 10: Sufficient power to detect a clinically important effect; Descriptor = Bad: 0–20%; Poor: 21–40%; Fair: 41–60%; Good: 61–80%; Excellent: 81–100%.

Risk of Bias Within Studies

Risk of bias was assessed with the adapted Downs and Black checklist for the 18 included studies (Table 4). The range of scores among studies was 40% to 80% with a mean of $64\% \pm 14\%$. IS studies reached higher scores with a mean of $72\% \pm 13\%$ and the SET had the lower group mean ($55\% \pm 14\%$).

Common flaws in reporting included not clearly describing the aims of the study (only in SET studies) or the characteristics of the participants, such as the classification system of VI. Few studies did not provide detailed information on interventions protocol or in the main findings domain.

Only two studies received points in the external validity item consisting of reporting on the representativeness of the samples. All of the LTPA and IS articles reported that the staff, places and facilities where the participants were tested were representative of the testing conditions that would be expected by most individuals. In contrast less than half of the articles in the SET domain adequately reported on this item. In the internal validity section, all studies received one point on the appropriateness of statistical tests used to assess the main outcomes. One half of the studies met the criteria on reporting the main outcome measures to be accurate with reliable and valid protocols for the review's population. No points were given to any study in the power item.

Discussion

In this systematic literature review we synthesized the available research on physical activity-related interventions for children and youth with VI. The 18 included investigations were classified as SET, LTPA or IS interventions. Respective summarized findings on groups of interventions, along with the risk of bias within studies, strengths and weaknesses, and directions for future research, will also be addressed in this section.

Findings on groups of interventions

The included SET studies were globally distributed and developed mostly in schools for children and youth with VI. Overall, these interventions were effective in improving physical fitness and motor skills through a variety of programs ranging from basic movements, like balance exercises (Jazi et al., 2012), body coordination, visual motor control, finger dexterity (Aki et al., 2007), and ergometer cycling (Shindo et al., 1987), to more complex activities such as rope jumping (Chen & Lin, 2011), gymnastics (Hashemi et al., 2012), Greek traditional dances and Pilates (Mavrovouniotis et al., 2013). While no harm to participants was reported in any study, in Mavrovouniotis et al. (2013) the group of youth with VI who participated in physical education classes showed no improvements on balance outcomes after an 8-week period. Whether this lack of effect occurred because of unrelated training and assessments, short-term program duration, or participant class engagement, among others, is yet to be known.

Although none of the included studies provided the recommended 60 minutes of daily MVPA, this amount can be achieved in a cumulative manner, and then multiple programs and strategies are necessary. Nonetheless, it is important to acknowledge that the applicability of the interventions presented here requires contextualization as studies comprised a wide variety of participant characteristics (i.e., age, VI level) and settings. Practices that are developmentally appropriate to mature boys and girls may not be suitable for younger children, in the same way as IS may differ between groups. Towards this idea, one study presented a one week sports camp (Ponchillia et al., 2005) designed with body mechanics activities (8 to 12 year olds) and sport-specific activities (13 to 19 year olds). Unfortunately this and others SET studies presented little or no information on how the programs were taught and which instruction strategies were applied. As vision plays an important role in the motor learning process (Poole, 1991), relevant information could be made available to VI professionals. Moreover, whether interventions can be applied to a

specific setting depends on the variables examined related to culture, socio-economic status and educational guidelines, specifically when considering the inclusion paradigm.

We also investigated interventions designed to encourage children and youth with VI to be more active during their leisure time. For instance, Cervantes and Porretta (2013) demonstrated that youth with VI, who lived in a residential school and participated in after school programming, were able to increase their levels of MVPA during an intervention based on Social Cognitive Theory. Unfortunately, the maintenance effects were not observed and to address this issue the authors suggested longer interventions that faded over time. Morelli et al. (2010) and Morelli et al. (2011) assessed two modes of exergames and found that the inclusion of tactile feedback technology made this an efficient technique for children who are blind to achieve at least moderate levels of physical activity while having fun. Also investigating exergames, other researchers (Boffoli et al., 2011) have found that children and youth with low vision enjoyed playing three common games, with only adaptation of projecting them on a large screen. These are promising ways for this group to be more active; however, the accessibility of this kind of practice raises cost-effectiveness questions and needs to be further weighed in comparison to other activities.

Albeit peer tutoring has not been recognized as an evidence-based practice for the inclusion of students with disabilities in adapted physical education, research support it as a favorable practice (Kalef, Reid, & MacDonald, 2013). In the present review, the IS group encompassed two studies that confirmed this assumption. Fernandez-Vivo (2002) and Wiskochil et al. (2007) showed that students with VI were less active than their sighted peers and were able to increase their academic learning time in Physical Education classes during the implementation of a peer tutoring program. As a support tool it can be used to assist both the teacher and the student in inclusive settings (O'Brien, Kudláček, & Howe, 2009); however, more research is needed before any recommendations can be made as both studies used small sample sizes ($n = 3$; $n = 4$).

Recently, Shields et al. (2012) summarized the most common factors influencing physical activity for children with disability, and explained that many barriers were associated with facilitators to physical activities. Therefore, based on their findings we detected among our included studies several characteristics related to facilitators to physical activities. For instance, the child's desire to be fit and active and practice to gain skills and competence was identified by those authors as a *personal facilitator*, which can be encouraged through the participation in interventions like those proposed in the SET studies or by applying the strategies suggested by Cervantes and Porretta (2013) and Joseph (1984). Having fun is another personal factor related to engagement in physical activities, and was found to be a positive aspect of the three exergame studies included in this review (Boffoli et al., 2011; Morelli et al., 2010; Morelli et al., 2011).

The Involvement of peers and family support in physical activity was mentioned by Shields et al. (2012) as an emerging *social facilitator*. Regarding this topic, Robinson and Lieberman (2007) proposed a parent resource manual to assist families in improving their children's participation in physical activities. Additionally, the studies of Fernandez-Vivo (2002) and Wiskochil et al. (2007) addressed peer tutoring, an effective IS to involve students with VI and their peers in a supportive environment. Finally, the current review as a whole is related to the facilitator *policy or programme*, as it represents a comprehensive knowledge base, that can be used in professional preparation programs and impact staff skills and information dissemination.

Previous reviews investigating physical activity and VI focused mostly on the determination of the levels of physical fitness and motor skills of participants who were blind or had low vision, and on comparing scores between sex or in relation to sighted individuals (Depauw, 1981; Skaggs & Hopper, 1996). Recently, Houwen, Visscher, et al. (2009) examined variables that affect motor skill performance of children and youth with VI and found a weak relationship between movement interventions and motor skill performance. In the present review

we assessed physical activity interventions categorized as SET, LTPA and IS preventing any comparison with earlier reviews.

Risk of bias within studies

We identified a number of methodological limitations following the application of the modified Downs and Black checklist (Downs & Black, 1998). One common source of bias was the failure of most SET (Caliskan et al., 2011; Chen & Lin, 2011; Mavrovouniotis et al., 2013; Ponchillia et al., 2005) and IS studies (Joseph, 1984; Lieberman et al., 2001; Wiskochil et al., 2007) to clearly describe or use a VI classification systems. Since the sight ability is different between children who are blind and those with low vision, it is very important to use a recognized system (i.e., ICD, USABA, IBSA) to guarantee the specificity of findings. Another issue found in three SET cases (Chen & Lin, 2011; Hashemi et al., 2012; Ponchillia et al., 2005) referred to the clarity of a study's hypothesis/aim description, which could easily be enhanced by asking colleagues to read the manuscript and provide feedback on it.

In a previous review, Skaggs and Hopper (1996) emphasized the need to develop motor assessment methods that are valid for individuals with VI. Though some valid tests have become available that evaluate health-related physical fitness among children and youth with VI (Winnick & Short, 2005) and gross motor development of primary school-age children with VI (Houwen, Hartman, Jonker, & Visscher, 2010), none of the SET studies made use of them. Rather, protocols developed for sighted individuals were used instead. It would be reasonable to assume that those with moderate low vision or with B3 classification could perform most tests in a proper manner similar to their sighted peers. However, as visual function decreases, the performance will probably be impacted, reducing the validity of the findings of some included studies (Aki et al., 2007; Chen & Lin, 2011; Hashemi et al., 2012; Mavrovouniotis et al., 2013; Morelli et al., 2010; Ponchillia et al., 2005).

Furthermore, low sample size and heterogeneity of participants were common issues between and within studies, factors that do not allow us to draw firm conclusions about physical activity interventions for children and youth with VI. To address these issues, researchers could gather a larger number of volunteers in specialized schools for students with VI or in three to seven day sport camps specific for this group. These camps are usually university-based and may expedite the accessibility to facilities, labs and research partnerships. Nevertheless, because of the trend towards the inclusion of students with disabilities in regular schools, there is a challenge to congregate more than a few individuals with VI. In this scenario, the use of single-subject research design, particularly for LTPA and IS studies, seems to be the most appropriate choice, and its consistent replicability can help to determine evidence-based practices (Horner et al., 2005).

Strengths and limitations

Even though the adapted Downs and Black checklist (Downs & Black, 1998) provides a way to assess the methodological limitations of studies, it may not provide a valid or comprehensive assessment for each study (Hinckson & Curtis, 2013). Due to the study designs, heterogeneity across research participants, programs, and outcomes assessed, we were unable to apply any approach to provide evidence-based recommendations. We recognize that by restricting the eligibility criteria to include only works published in English we may have excluded potential studies related to the theme. Conversely, by following the Cochrane (Higgins, 2008) and PRISMA (Liberati et al., 2009) guidelines for reporting systematic reviews and by including only original research, we assured reasonable quality of the reviewed material. Hence, in the light of the presented findings practitioners are provided with base knowledge to help children and youth with VI to achieve the recommended amount of physical activity, and benefit from the involvement in an active lifestyle.

Directions for future research

Researchers willing to conduct studies on physical activity for children and youth with VI can start by overcoming the studies' weaknesses found in this synthesis. For example, they must clearly report the purpose, participant characteristics, and interventions. While the use of valid and reliable outcome measures for this population is essential, only a few of such tests are available. Instead of conducting research with tests designed specifically to sighted groups, a venue for future research is to direct efforts to validate newly created or adapted tools that are relevant for populations with VI. Researchers should also consider the development of interventions specific to children or youth who are either blind or have low vision, since modes of instruction might differ among groups due to age and visual function.

Furthermore, the barriers and facilitators to physical activity for children and youth with VI should be taken into consideration in future studies. If the interest lies in exploring SET interventions, programs could incorporate opportunities for participants not only to be fit, but also to gain skills and competence in a variety of activities. Until now, most of the available studies have focused on non-competitive activities, and an investigation is always warranted into the impact of practicing competitive sports, such as those included in the Paralympic Games. Additionally, LTPA researchers could evaluate home or community-based interventions that involve family members or peers, in fun and supportive activities. Finally, the aim could be to assess the effectiveness of IS interventions, by investigating curricular adaptations in inclusive schools, and methodological modifications in the later, and also in recreational groups, and other community facilities.

Conclusion

The present review has the potential to convey meaningful knowledge about physical activity interventions for children and youth with VI. Most of the SET interventions yielded positive

effects on physical fitness and motor skill performance of children and youth with VI. LTPA interventions satisfactorily could engage this group in at least moderate levels of physical activities, and IS interventions showed to be promising in enhancing their motor learning experience. Nevertheless, current research on physical activity interventions for children and youth with VI is still limited by an absence of high quality research designs, low sample sizes, use of non validated outcome measures and lack of generalizability. Furthermore, the heterogeneity in research participants, programs, and outcomes assessed, limits the quality of evidence rating which are central concerns that need to be addressed in future studies.

The Characteristics of Camp Abilities, a Sport Summer Camp for Children and Youth with Visual Impairment: A Multiple Case Study Approach.

Abstract

In North America, it is estimated that more than 11 million children and adults attend camps each year. This setting has been shown to contribute to positive youth development, particularly for groups with disabilities. The purpose of this study was to describe the characteristics of Camp Abilities (CA), a sport summer camp for children and youth with visual impairment (VI). In this descriptive multiple case study, the data collected comprises interviews with seven adapted physical education faculty members, questionnaire, and document analysis. Camps were often run at university's campus, where undergraduate and graduate physical education students perform the role of instructing campers and eventually help in the camp organizing process. These camps include a minimum of 30 to more than 120 participants (directors, campers, coaches, and specialist) each edition, lasting from four to seven days. In this scenario, although each camp has particular features, camps' purposes, participants, activities and schedules are very similar, showing that CA is a feasible and reproducible approach, which can provide enriching opportunities for diverse groups.

Keywords: summer camp; visual impairment; sport; physical activity.

Introduction

In North America, the tradition of organized camp dates back to the middle of the 19th century, persisting to the present day being, perhaps, one of the largest interventions for children apart from schools and churches (Bialeschki, Henderson, & James, 2007). Yearly, it is estimated that more than 11 million children and adults attend camps (residential or day camps), in over 12,000 locations throughout the United States of America (American Camp Association, 2015). The conventional concept of camp refers to “organized experiences in group living in the outdoors that use trained leaders to accomplish intentional goals” (Henderson, Bialeschki, & James, 2007, p. 755). In camps, participants are often in contact with nature during the summer time, though some programs may be developed in settings such as churches, schools and universities’ campus (Walsh, 2011).

In the last two decades camp research became more evident, with studies being conducted in two major areas classified as outcome and operations research (Henderson et al., 2007). Although general day and resident camps may have been an underrecognized setting to contribute to positive youth development, outcome research “point to increases in positive identity, social skills, physical and thinking skills, and positive values and spirituality” (Bialeschki et al., 2007, p. 784). Particularly, sport camp outcomes for children and youth with VI have received special attention. For example, from a study based on The National Sports Education Camps (NSEC) project, Ponchillia, Armbruster, and Wiebold (2005) reported that by participating in a one week residential sports education camp, students with VI knew more about sports, improved physical skills, held more positive attitudes, and were more likely to become involved in local sports activities.

Camp Abilities (CA), another sport camp designed for children and youth with visual impairment, was created in 1996 and has been replicated in more than 22 locations across the

United States of America and in other countries (Haegele, Lieberman, Lepore, & Lepore-Stevens, 2014). Contrary to the NSEC program, CA is set up to provide a one-on-one instructional situation for each, most often camper accompanied by an undergraduate or graduate physical education student serving as their coach. In this setting, the outcome to campers included reaching unprecedented and desirable high levels of physical activity (Lieberman, Stuart, Hand, & Robinson, 2006; Tudor-Locke et al., 2011), the acquisition of new sport skills, the perception of their potential, and the testing of individual physical limits which served to set new self-defined standards (Goodwin, Lieberman, Johnston, Leo, 2011). For coaches, the outcomes included the improvement of attitudes toward their ability to teach this group (Ellis, Lepore, & Lieberman, 2012; Lieberman et al., 2006).

As proposed by Henderson et al. (2007) operations research, a second area of camp research, include topics like staffing, camp evaluation, and business analysis. In addition to these topics, Garst, Browne, and Bialeschki (2011) proposes several camp characteristics (i.e., setting, program and activity), that are important to provide the supports and opportunities needed for positive youth development. Research regarding these topics on sport camps for children and youth with VI are limited. Few materials addressing this issue have been published (Schedlin & Lieberman, 2011, Haegele et al., 2014), however, none of them as a systematic original research. Thus, based on a multiple case study approach, the purpose of this study was to describe the characteristics of seven CA.

Methods

Case Study Design

This research is characterized as a descriptive case study, as there has been no empirical research conducted on the characteristics of CA, a sport summer camp for children and youth with

VI. A multiple case study design, considered to be more robust than single case study, was used in this investigation, allowing a single set of cross-case conclusions (Yin, 2009).

Sample Selection

Purposeful sampling was used to discover, understand, and gain insight from a specific situation (Merriam, 1998). The second author of this study, founder of CA Brockport, identified eight university-based camp directors. Eventually, seven participants (six female and one male) took part in the study.

Data Collection

The first author was responsible for the data collection over a period of 14 weeks (Oct 22 – Feb 1, 2014). There were three data sources used in this study: (1) questionnaires, (2) document analysis, and (3) interviews. Before developing the data collection protocol, the first author participated in two different CA (10 days' experience), when observations were made, and notes were taken to record characteristics and organization processes of both camps. Ultimately, these notes were used to guide the creation of the study's data collection protocol.

The data collection process consisted of a first contact e-mail explaining to likely participants the purpose of the study, and its procedures. Additionally, the e-mail contained copies of the informed consent and the questionnaire. After receiving the signed informed consent and the completed questionnaire, the researcher proceeded with the analysis of documents related to each participant (camp website information) and subsequent scheduling of a Skype or phone interview. The project was approved by the researchers' University's Internal Review Board (IRB).

Questionnaire. The questions covered information of each CA characteristics (see Appendix A, items 8-17). The main characteristics of cases are available in Table 5, in which each case was numbered to retain anonymity.

Semi-structured interviews. Interviews were conducted to obtain information on relevant aspects of camps and its participants (see Appendix B, items 1-6, 19, 23, and 24). The interview guide was developed in a way to ensure each participant was asked similar questions and to cover the areas of interest. The guide allowed flexibility to explore participant's responses to the questionnaire, and to investigate emerging themes likely to be important. The questionnaire and interview guide were pilot-tested with one eligible participant and provided an opportunity for checking the appropriateness of questions, the time needed for conducting the interview, and for the field researcher to practice his interviewing skills.

The interviews were conducted by the first author. Because of geographical distance (five in different USA states; one in Central America; one in Europe) between the respondents and the interviewer we found to be most suitable to conduct the interviews through Skype-to-telephone (n = 4) or non visual Skype-to-Skype (n = 3) calls. All of the interviews were recorded using the MP3 Skype Recorder software 3.1. The interviews were transcribed verbatim by a professional transcriber, and each transcript was reviewed against the audio record for accuracy.

Document analysis. Electronic documents from each camp website were examined, helping to substantiate the findings from questionnaires and interviews.

Data Analysis

Interviews, questionnaires, and documents, were analyzed in a three-step process of data condensation, data display and conclusion drawing/verification (Miles, Huberman, & Saldaña, 2014). Data condensation occurred continuously throughout this project and consisted of decisions on choosing the conceptual framework, the cases, the research questions and the data collection approaches. As the research proceeded, this phase also included: writing summaries, coding, developing themes, and sub-themes. Based on inductive and deductive approaches an initial

coding list was created, and served as the foundation to the data analysis (Ryan & Bernard, 2003; Yin, 2009; Miles et al., 2014).

In the next phase a strategy called stacking comparable cases was employed, consisting of a mixed technique of case and variable oriented approaches. First, each case was displayed in a matrix and analyzed in depth. Then, we stacked the case-level displays in a meta-matrix (lines and columns) with all the cases (Appendix F), and explored similarities and differences across cases and variables. This organized, compressed congregation of information allowed the development of assertions and propositions, representing the final researcher's analytic choices (Miles, et al., 2014).

Trustworthiness

We employed a variety of strategies to ensure the study's trustworthiness. To establish content validity of the data collection instruments, two experts in qualitative research and three adapted physical activity faculty members reviewed and provided feedback on the elements of the questionnaire and interview guide (Haynes, Richard, & Kubany, 1995). Before field work commenced, both instruments were pilot-tested allowing further adjustments. To increase construct validity, the development of a sufficiently operational set of measures was accomplished by using multiple data sources (documents, questionnaires, and interviews). In addition, member checks were performed when participants had the opportunity to check and confirm the accuracy of interview transcriptions (Yin, 2009). Further, to address reliability, or the ability of different researchers to reach the same conclusions about the same case studies, we created a formal computerized database, including all documents, questionnaires, and interviews (Yin, 2009).

Table 5. *Camp Abilities Characteristics*

	Camp 1	Camp 2	Camp 3	Camp 4	Camp 5	Camp 6	Camp 7
Camp editions	3	10	2	19	2	9	4
Camp length (days)	4	7	4	7	7	3	7
Number of campers (last edition)	21	20	12	53	12	27	33
Number of coaches (last edition)	25	30	17	70	20	30	33
Coaches origin	100% LUPEC	50% LUPEC; 50% other courses from the same university	100% former LUPEC	15-20% LUPEC and LGPEC; 80- 85% other national and international universities (VI related courses)	100% LGPEC	100% LUPEC	40% LUPEC; 60% UPEC from national universities and VI related organizations

Legend. LUPEC: local undergraduate physical education course; LGPEC: local graduate physical education course; UPEC: undergraduate physical education course VI: visual impairment.

Results and Discussion

The purpose of this study was to describe the characteristics of CA, a sport summer camps for children and youth with VI. From a multiple case study approach, we found two main themes, “people” and “camps”. Within the theme “people”, four sub-themes emerged: directors, campers, coaches, and specialist. Within the theme camp, four reoccurring sub-themes were found: CA purposes, sports and physical activities, changes, and funding.

The People

Directors. All of the participants were responsible for teaching the adapted physical activity class in a physical education or related course (i.e., kinesiology or sport studies). The sample had an average of 13 years (3 to 31) of teaching experience in higher education, and an average of 7 years (2 to 19) of experience in running a CA. Before starting their own CA three of the directors had themselves volunteered in a CA, two had a co-director who volunteered and shared the experience, and in one circumstance the director had heard about CA in a conference, contacted the founder of CA, and received directions of how to start the camp.

Directors’ responsibilities. Except for participant five, who is responsible specifically for facilitating the collaboration with university facilities, recruiting, and advising graduate and undergraduate students volunteers, all directors are involved in the whole process of planning, organization and running of the camp. This tripartite process incorporates fundraise, overseeing athletes, coaches, volunteers, paid staff, sports, equipments, food, accommodation, certificates, and schedules. In this regard, participant six just says "I do everything but coach a sport".

Shared responsibilities. Sharing duties in a packed event like a sport summer camp for children and youth with VI is crucial, so no one gets overwhelmed by the overload of activities. Therefore, in three camps the directors are assisted by undergraduate or graduated volunteers,

linked or not to an adapted physical activity class. In camp four, two graduate students receive a one-year scholarship and in camp seven one undergraduate receive a four-month internship to help in camp organization. In the other two camps there was a team (people from organizations for people with VI and students enrolled in an adapted physical activity class) working together to run camps.

Campers. CA is specially designed to attend children with low vision or blindness (Lieberman & Lepore, 1998). Participants reported that campers generally come from the surrounding community and those who attended once, usually return to the same summer camp in the following year. For example, to be eligible to participate in CA Brockport, campers must possess the following characteristics:

- Are between the ages of 9-19
- They have a VI (must have a vision teacher)
- They are predominantly independent (helping with tying shoes, bathing, toileting, or picking clothes is fine)
- They possess verbal or sign communication skills appropriate within 2 years of their age
- They display behaviors that allow them to function in a group setting that does not affect other group members (no biting, kicking, displays of defiant behavior, running away)
- They do not possess a medical problem that requires a nurse for constant supervision (Camp Abilities, 2015).

Besides including children and youth with VI, two camps assessed in this study also accepted a small proportion of participants with other disabilities, such as deafblindness (case four) autism, intellectual disability, and multiple disabilities (case seven). Although these accommodations are possible and seems to be positive for those involved, it is important to

evaluate if modifications in activities, instruction or equipments are necessary for each case, as the program is specially designed for those with VI. Regarding age, some camps may differ from the Brockport criteria and only include athletes within a specific age range (10 – 14 year) or may accept children a little younger, at age seven.

Coaches. Alongside with campers (also called athletes) the coaches (also known as counselors) are a key group in CA. Working on a one-on-one relationship with campers throughout camp length, the coaches are responsible to assist in each activity. Coaches are 18 or older physical education students, except in camps two, four and seven, in which a small proportion of high school students, undergraduate students from other course, or former camp attendees with VI are accepted as coaches. In the later three camps, coaches can earn practicum credits. In cases six and seven, camp is based in a service-learning approach. In all camps, coaches are not paid

Coaches training. Previous to camp commencement, all CA have a training for the coaches, and although variations in length may occur, all follow similar contents, as presented by participant four:

“On Saturday morning we have the orientation, where we have about an hour of just sitting in a big room, getting to know who's there. And then we break up into different groups and we look at eye conditions, and we look at developmentally appropriate practices, we look at guiding techniques, how to you carry a lunch tray... they get their child's file, and they get to see what their child's impairment is, how old they are, what sports they like, how many years they've been at camp... they actually also go over the pool and all the aquatics responsibilities, and then we go from activity to activity... they get to try it, and they get to

see what it's like with a blindfold on so they can teach their children. How do you position the child. What is a proper throw. What is a proper way to throw in goal ball. What's a safe way to play beep baseball. Then Sunday morning we get together, and they get a presentation from the nurse about medications, about safety. We have a presentation from the police about safety on campus. We talk about the rules in the dorm. We talk about the rules for the cafeteria. We talk about being polite.”

Specialist. In CA, sports specialists are the ones responsible for teaching a specific sport. These can be former athletes, but typically they have a degree in physical education and experience in the sport taught. The specialist’s role is to instruct campers who are then assisted by coaches, who provide additional support throughout the activity (Haegele et al., 2014). Except in camp four, sports specialists are also not paid, though in some cases they receive help with their travel expenses. The participants of this study reported that specialist, in most of the times, were their former students in higher education.

The Camps

Camp Abilities purposes. The participant four, founder of CA at Brockport, explained that camp has been developed to meet four purposes. First, to provide an opportunity for children with VI to learn how to do after school and Paralympic sports, how to modify activities and accommodate their needs. Second, to train future teachers how to teach children with VI. Third, to conduct much needed research, and lastly to provide a week of respite for the parents. As stated in CA websites, all cases shared the same purposes of the original CA, except for the research purpose. From our data, only participants four and seven mentioned they conduct research at camp in a regular basis.

Sports and physical activities. In the mornings and afternoons, camps' programs most commonly consist of sports such as goalball, beep baseball, judo, track and field, swimming, tandem biking, and gymnastics. Additionally, other activities may also be performed (i.e., soccer five-a-side, basketball, rock climbing, horseback riding, mechanical bull, archery, beep kickball, paddle board, kayaking, cross-country running, rollerblading, duathlon and triathlon) depending on the availability of equipment and facilities or the specificity to the geographic region where the camp occurs. The night program, while still comprises some of the aforementioned activities, is more aimed to foster socialization among the participants through a variety of activities including talent shows, dance, music, cooking, fishing, showdown, arts-and-crafts, and bonfire.

From the first author's field notes, we present the example of one day schedule during the Brockport CA 2013.

7:45-8:45am - Breakfast

8:15am - Specialists meeting

8:30am - Everybody meets for care to share

8:45-9:10am – Gather belongings for morning activities

9:30-12:30pm - Morning activities (tandem biking, beep baseball, track and field, and judo)

12:30-1:30pm - Lunch

1:30-2:30pm - Foot on bed

2:50-5:15pm – Afternoon activities (goalball, swimming, and gymnastics)

5:45-6:45pm – Dinner in dorms

6:15pm - Everybody meets for care to share

6:45-8:45pm - Night activities (canoeing, rollerblading, show down, basketball)

8:00pm - Snack

9:00pm - Mandatory showers

10:00pm - Lights Out

10:00pm –Mandatory staff meeting in lounge.

In a place where participants engage in different activities throughout the day, the structured instructional model used in CA deserves attention. According to Haegele et al. (2014, pp. 476-477), the instructional model followed at most camps are based on two levels of instruction:

“The sport specialist provides the first level of instruction by teaching basic information about a specific sport or activity to a group of campers and their one-on-one coaches in small groups. This information can include an introduction to skills, strategies, modifications, and safety elements that are essential to the activity. Further, the sport specialist organizes the activity lesson, including components such as practice sessions and scrimmages.

The second phase of the instructional model is an one-on-one session with the camper’s coach, and includes more in-depth and individualized training. After receiving information on the theme or objective of the activity, the coach and camper work together to learn, refine, and master skills. During this time, the sport specialist in charge of the activity can assist each coach-and-camper pair by providing additional support or tips on modifications on how to adapt the game of necessary.”

Changes. When asked how their CA had changed over the years, directors reported several aspects. For instance, participants one, two, and five agreed that participating in other camps or

having someone with previous experience in CA helped them to reorganize their activities and the transitioning between them, which made camps more dynamic, and allowed more activities to be included in the program. In addition, participant six commented that, at the beginning her camp was held only from Saturday to Sunday, and due to attendees' and students' demand it became longer and longer, being extended to run from Friday to Monday. Besides that, the number of participants tend to rise with camp maturity. For instance, this last camp started with nine children and evolved to 28 campers in its ninth edition. Participant seven further commented on how her camp changed and explained they started with sports they knew about and were comfortable with, and then changed some of the sports and added new sports. Last, participant four added a relevant view about how her faculty members' roles was integrated and how it progressed:

“At the beginning of camp it was all about teaching and service. I had to get money, I had to have students participate. I couldn't even think about research. But about three years into it I thought I could fit some research in... now I see such a value in the research part of it that I always want that to be part of it what we do, but I don't want to lose the focus of the main purpose as teaching: teaching the kids and teaching my students.

Funding. Fundraising is a central aspect of CA. Schedlin and Lieberman (2011), in their handbook for starting sports camps for children with VI, highlighted that the availability of funds must be taken into consideration during the initial stage of program development. For this task, the authors suggest the involvement of community including Lions Clubs, local service organizations, religious organizations, or fraternities and sororities. Further, writing research grants is also another option for faculty members directing a camp. In the present study, the participants reported adopting all or a combination of these strategies and mentioned that because they were faculty members, they could run the program on campus. Which is financially beneficial, as they were not

charged or at least received a discount for the use of campus facilities (i.e., gymnasiums, dormitories, offices), staff, and equipments, except for participant seven who run camp outside campus.

We consider important to mention that one of our previous studies (Article 3 in this dissertation) showed consistent positive effects of running a CA on faculty members teaching and service roles. The directing experience improved faculty members' disability knowledge, allowed them to teach using real life examples, which consequently gave them more credibility in class. Physical education students also benefited from camp participation by having an opportunity to apply theory to practice, change attitudes, and share out-of-class moments with their teacher throughout the length of camp. Within the theme service, directors reported the increase of disability awareness among CA participants, also including those occasionally watching the activities. Further, CA was an unique sport experience opportunity for children and youth with VI from the statewide community. These results corroborate the findings of similar studies conducted by Marston (2002) and Walsh (2011).

Conclusions

Based on a multiple case study, we determined the characteristics of seven CA, developmental sport summer camps for children and youth with VI. Directed by adapted physical activity faculty member, camps were often run at university's campus, where undergraduate and graduate physical education students have the role to instruct campers and eventually help in the camp organizing process. These camps attended a minimum of 30 to more than 120 participants (directors, campers, coaches, and specialist) each edition, lasting from three to seven days. In this scenario, although each camp has its own particular features, camps' purposes, participants,

activities and schedules are very similar, showing that CA is a feasible and reproducible approach, which can provide enriching opportunities for diverse groups.

The Impact of Running a Sport Camp for Children and Youth with Visual Impairments on Faculty Members' Teaching, Research, and Service

Abstract

In the present study we aimed to explore the impact of running a sport camp for children and youth with visual impairment (VI) on adapted physical activity faculty members' teaching, research, and service. This research is characterized as an exploratory case study. Seven adapted physical activity faculty members, currently running a camp for children and youth with VI participated in the study. Interviews were used as the main source of evidence. Questionnaires and documents were also analyzed in a three-step process of data condensation, data display and conclusion drawing/verification. We employed a variety of strategies to ensure the study's trustworthiness (i.e., content validity, construct validity, member check, peer debrief, and reliability). Three themes emerged as result of the data analysis: teaching, research, and service. Regarding the teaching role, the directing experience empowered faculty members by improving their disability knowledge and by allowing them to teach using real life examples, which would give them more credibility in class. The expected outcomes for coaches-students included the application of theory to practice, attitudinal changes, and frequent out-of-class contact between students and faculty throughout the length of camp. As for the research role, although the published studies helped to created a specialized body of knowledge about physical activity for children and youth with VI, the outcomes were not shared by the majority of participants and seemed to rely on aspects such as camp maturity, directors' aptitudes, partnership with other researchers, and collaboration with graduate students. In turn, running the camp was a means for faculty members to perform their external service roles, either by consulting or as a service-learning approach.

Keywords: sport summer camp; faculty members; adapted physical activity, teaching, research, service learning.

Introduction

Technological advances and rapid globalization are particular challenges to contemporary universities. The transformation in work, leisure time, and formal schooling structures drive academic institutions often to redefine their goals if they want to keep up with the changing world. In this context, while some universities state particular educational, social, political, or spiritual aims, most of them still have fundamental goals based on the triad of teaching, research, and service (Scott, 2006).

With the focus on the development of civic leaders and productive citizens (Antonio, Astin, & Cress, 2000), who understand and deal intelligently with modern life (Chickering & Gamson, 1987), the teaching role is of primary importance in undergraduate and graduate courses. When sharing knowledge to students and assisting students during their learning process, faculty members are enacting their teaching role. As suggested by Umback and Wawrzynski (2005), if educational practices, such as active and collaborative learning, engagement of students in experiences, and interaction with students are employed, certain outcomes of college are likely to occur (e.g., student learning and retention). Furthermore, the same author found that “faculty behaviors and attitudes affect students profoundly, which propose that faculty members may play the single-most important role in student learning” (Umback & Wawrzynski, 2005, p. 154).

Alongside with teaching, research represents the core mission of universities worldwide. According to Scott (2006) “the research mission is valuable for the improvement of societies around the globe - creating a skilled workforce, enabling economic growth, improving health care, and encouraging knowledge production” (p. 23). Pertaining to this matter, Reid and Stanish (2003) supports that the specific body of knowledge of a given discipline is developed through research,

showing a consistent link between the teaching and research roles. In large universities, the research role is more commonly part of faculty responsibilities, as these institutions have the majority of graduate courses and provide financial, human and material resources for researching. Although teaching activities are rewarded in higher education institutions, traditionally research is the most prestigious and valued among the three common faculty roles (Servage, 2009).

The faculty service role, characterized by Ward (2003) as a multifaceted concept with internal and external dimensions, tends to be considered of lesser value than teaching and research because it is vaguely understood, defined, and consequently rewarded. In an effort to clarify this role, Ward defines the first dimension as service to the institution and the later as a way to connect teaching and research to community and societal needs. External service is expressed through extension, consulting, service-learning, community-based action research, and community and civic service. Specifically, faculty consulting is the natural extension of scholars expertise outside the academic institution (Boyer & Lewis, 1984) and service-learning is the integration of community service projects into academic course work, serving as a venue for students to acquire academic, career, social, and personal skills (Cutforth, 2000; Astin, Vogelgesang, Ikeda, & Yee, 2000).

According to Marston (2002) “a major challenge for most university faculty members is how to best channel one's interests, time, and energy in a way that most efficiently addresses each aspect of the tripartite structure”(p. 35). In this sense, the author explained that through directing an early childhood movement program he tried to tackle all of the three roles. Related to the teaching role he described using a variety of teaching techniques while mentoring his university students in designing and delivering movement activities. From the research perspective, he used the data collected from the program in presentations, workshops, and publications. Last, regarding the service component, Marston (2002) points that besides the provision of movement experiences

to the children and the educational materials to the parents, the program was also associated to the area of public relations (i.e. a form of university outreach to the community). In a similar study, Walsh (2011) supported the idea that being able to tie teaching, research, and service activities to a university-sponsored youth sports summer camp helped to create a justifiable, longstanding project. Walsh noted it was possible to validate camp through the faculty roles by offering credits to preservice physical education teachers, by allowing graduate students to conduct research projects, and by providing local community with a sport summer camp option for their children and an employment opportunity for local students and teachers.

Although these two single case studies shed some light on how faculty roles can be integrated into a movement or sport program, it was only addressed from single case studies, including participants without disability. For instance, faculty members teaching the adapted physical activity / education courses could also professionally benefit from running a specially designed program for participants with a given disability. For example, one such program is Camp Abilities (CA), a developmental sport camp for children and adolescents with visual impairment (VI). The camp was created in 1996 at the College at Brockport, State of New York, USA, and has been replicated at over 22 locations across the United States and in countries including Canada, Costa Rica, Finland, Ireland, Guatemala and Portugal (Haegele Lieberman, Lepore, & Lepore-Stevens, 2014). Among camps, eight are run by an adapted physical education faculty members and usually at their institution campus. All CA share a similar structure and mission, though specific geographical aspects may be considered in the program of each camp. Camps serve 20 to 55 campers who are on a one-on-one basis with coaches, from undergraduate or graduate courses, who are training to be physical education teachers, teachers of students with VI, or special education teachers (Haegele et al., 2014).

Given the increase in CA numbers and how it has been spreading worldwide in recent years, research on topics of interest are warranted. To the best of our knowledge, no studies have been published addressing the outcomes of running a sport camp for children and youth with disability in faculty members' roles. Thus, in the present study we aimed to explore, from a multiple case study perspective, the impact of running a sport camp for children and youth with VI on adapted physical activity faculty members' roles.

Methods

Case Study Design

This research is characterized as an exploratory case study as there has been no empirical research conducted about the impact of running a sport camp for children and youth with VI on faculty members' roles. Yin (2009) states that exploratory case studies are adequate when the goal is to generate hypotheses and propositions about a specific phenomenon, the subject of this research. A multiple case study design, considered to be more robust than single case study, was used in this investigation, allowing a single set of cross-case conclusions (Yin, 2009).

Sample Selection

Purposeful sampling was used to discover, understand, and gain insight from a specific situation (Merriam, 1998). The second author of this study, founder of the sport camp for children and youth with VI, model of camp to be explored in the present studied, identified eight potential participants. All of the participants were faculty members, currently working in a higher education setting, teaching adapted physical activity / education courses and, finally, were responsible for running a camp for children and youth with VI.

Eventually, seven participants (six female and one male) took part in the study. The sample had an average of 13 years (3 to 31) of teaching experience in higher education, and an average of 7 years (2 to 19) of experience in running a camp for children and youth with VI. Additional

characteristics of the participants are available in Table 6. Each case was numbered to retain anonymity.

Data Collection

The first author was responsible for the data collection over a period of 14 weeks (Oct 22 – Feb 1, 2014). There were three data sources used in this study: (1) questionnaires, (2) document analysis, and (3) interviews. The data collection process consisted of a first contact e-mail explaining to likely participants the purpose of the study, and its procedures. Additionally, the e-mail contained copies of the informed consent and the questionnaire. After receiving the signed informed consent and the completed questionnaire the researcher proceeded with the analysis of documents related to each participant (university career progression policies and procedures; and camp website information) and subsequent scheduling of a Skype or phone interview. The project was approved by the researchers' University's Internal Review Board.

Questionnaire. The questions covered information of participant's education and professional background; characteristics of the sport camp for children and youth with VI; and Institution career evaluation (see Appendix A, items 1-9, 12, and 18).

Semi-structured interviews. Interviews were the main data collection method, considered to be a highly efficient approach to gather rich, empirical data (Eisenhardt & Graebner, 2007). Interviews were used to obtain information regarding areas of the faculty members' career that could be influenced by running a camp for children and youth with VI (see Appendix B, items 2-18 and 20-22).

Table 6. *Participants Characteristics*

	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5	Participant 6	Participant 7
Education	Master's (2012)	PhD (2002)	PhD (2007)	PhD (1996)	PhD (1993)	EdD (1992)	Master's (2012)
Faculty member since	2011	2002	2008	1995	2005	1983	2006
Faculty rank	Lecturer	Full Professor	Associate	Full Professor	Associate	Full Professor	Lecturer
Teaching level	Undergraduate	Undergraduate, Graduate (Master's)	Undergraduate, Graduate (Master's)	Undergraduate, Graduate (Master's)	Undergraduate, Graduate (Master's + PhD)	Undergraduate	Undergraduate
Camp editions	3	10	2	19	2	9	4

Legend. PhD: *Philosophiae Doctor*, EdD: *Educationis Doctor*.

The interview guide was developed in a way to ensure each participant was asked similar questions and to cover the areas of interest. The guide allowed flexibility to explore participant's responses to the questionnaire, and to investigate emerging themes likely to be important. The questionnaire and interview guide were pilot-tested with one eligible participant and provided an opportunity for checking the appropriateness of questions, the time needed for conducting the interview, and for the field researcher to practice his interviewing skills.

The interviews lasted on average 48 min and were conducted by the first author. Because of geographical distance (five in different USA states; one in Central America; one in Europe) between the respondents and the interviewer we found to be most suitable to conduct the interviews through Skype-to-telephone ($n = 4$) or non visual Skype-to-Skype ($n = 3$) calls. All of the interviews were recorded using the MP3 Skype Recorder software 3.1. Questions addressed possible outcomes of running a camp for children and youth with VI on faculty members' roles in higher education, with emphasis on teaching, research and service activities. Interviews were transcribed verbatim, and each transcript was reviewed against the audio record for accuracy.

Document analysis. Electronic documents from each university related to faculty members' career progression policies and procedures, and each camp website information was also examined. This information was used to help determine the outcomes of CA on different aspects of the faculty members' career path.

Data Analysis

Interviews, as the main source of evidence, questionnaires and documents, were analyzed in a three-step process of data condensation, data display and conclusion drawing/verification (Miles, Huberman, & Saldaña, 2014). Data condensation occurred continuously throughout this project and consisted of decisions on choosing the conceptual framework, the cases, the research questions and the data collection approaches. As the research proceeded, this phase also included:

writing summaries, coding, developing themes, and sub-themes. Based on inductive and deductive approaches an initial coding list was created, and served as the foundation to the data analysis (Ryan & Bernard, 2003; Yin, 2009; Miles et al., 2014). In order to reduce bias and ambiguity two researchers independently analyzed the data, and subsequently through discussion achieved consensus of findings.

In the next phase a strategy called stacking comparable cases was employed, consisting of a mixed technique of case and variable oriented approaches. First each case was displayed in a matrix and analyzed in depth. Then, we stacked the case-level displays in a meta-matrix (lines and columns) with all the cases, and explored similarities and differences across cases and variables. This organized, compressed congregation of information allowed the development of assertions and propositions, representing the final researcher's analytic choices (Miles, et al., 2014).

Trustworthiness

We employed a variety of strategies to ensure the study's trustworthiness. To establish content validity of the data collection instruments, two experts in qualitative research and three adapted physical activity faculty members reviewed and provided feedback on the elements of the questionnaire and interview guide (Haynes, Richard, & Kubany, 1995). Before field work commenced, both instruments were pilot-tested allowing further adjustments. To increase construct validity, the development of a sufficiently operational set of measures was accomplished by using multiple data sources (documents, questionnaires, and interviews). In addition, member checks were performed when participants had the opportunity to check and confirm the accuracy of interview transcriptions (Yin, 2009).

A comprehensive approach was used to analyze the data. The first and second authors independently performed the coding of the data and, through discussion, reached consensus on disagreements. Analytic triangulation occurred with the aid of a peer debriefer, a colleague with

experience in camps for children with disabilities, who reviewed and provided critical feedback on methodology, analysis, interpretations and study's results (Brantlinger, Jimenez, Klingner, Pugach, & Richardson, 2005). To address reliability, or the ability of different researchers to reach the same conclusions about the same case studies, we created a formal computerized database including all documents, questionnaires, and interviews (Yin, 2009).

Results

Three themes emerged as result of the data analysis: teaching, research, and service. Based on careful analysis of the results, this section will describe each theme and how directing a camp contributed to faculty members' roles. The themes are described using the participant's own words.

Teaching

The first theme that emerged from our interviews related to teaching. Participants mentioned this to be their main institutional role and added that by running a camp for children and youth with VI has been a rich opportunity for their professional development and to physical education students (Figure 2).

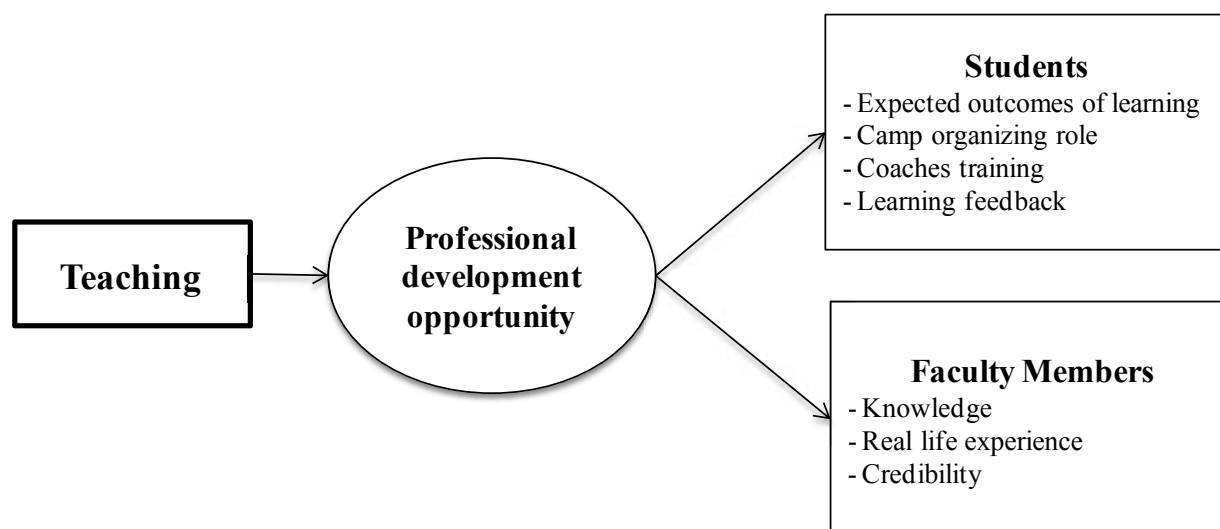


Figure 2: Visual representation of the theme teaching.

From the faculty professional development perspective two common outcomes were reported to be potentially beneficial from running a camp. First, it was *a way of acquiring more knowledge* about individuals with VI participating in physical activities. Participant five illustrates this by saying that “I didn't really get involved in sports for the visually impaired (before), so it has increased my knowledge and my awareness”. Another common thread was the *advantage of teaching based in real life situations*, which was richly expressed by participant six:

I get a chance to role model the teaching methods that I'm teaching them in class. So I use all of those things to help me identify that what I am teaching them is real. It reiterates that the things that I'm teaching are real. So that's professional development for me. And there's no doubt in my mind that with every camp something happens where I have to learn a lot more. It's one of the highest forms of professional development, to actually do it actively where you actually do the things that you believe are best practice. And then it gives you more information on how to teach better. And that's professional development to me.

In another perspective, participants expressed some form of enthusiasm when talking about the potential learning to their students who participated in camp. In broad terms, they expected student to learn how to work with this specific group of individuals with sensory impairment as a result of the training provided to coaches prior to camp, and from the one-to-one relationship with campers. In particular, they made clear their desire of students to reach an understanding of issues around VI; specific instructional strategies (p.e.: guiding techniques, auditory signals, tactile teaching techniques); equipments and, as mentioned by participant five “I want them to walk away feeling comfortable with working with individuals with visual impairments”.

For a majority of the participants, camp volunteers had an opportunity to perform and receive feedback for improvement on existing knowledge. Except for participant four, who

reasoned to have a mixed group of undergraduate and graduate volunteers from different universities, all participants mentioned giving feedback to students about their coaching role. In two situations when students received course credits for their participation in camp, they were formally evaluated at the end of camp. In the remaining camps, feedback was given during or after activities as exemplified by the words of participant six:

It's the perfect time for me to meet with the students to express my opinion about how they're doing. So they have a formative, not a summative, assessment. I can get to each one of them and say, 'You're right on. You're doing exactly what you're supposed to be doing. You're picking up things well, and I like your leadership'.

Evening chats or after camp gatherings were said to be moments to analyze situations, to discuss experiences, and to share memories. Overall, these moments were associated with personal and professional development. Nonetheless, in circumstances when a coach did not work as expected, extreme measures could be taken, such as the exclusion from camp, as reported participant two.

It is also important to note the opportunity for coaches to increase their disability awareness, to meet specialists in the field, and, for some students who took part in the organization of camp, the chance “to understand what goes into running a program like this, costs to run the camp, how do you raise the money”, from participant six words. To stress the value of this experience for coaches, participant one says: “The physical education students learn much more than they would learn in one semester in the classroom”.

Research

The second theme related to research. Based on our findings, the majority of participants develop some kind of camp-related research, except for faculty three and five who explained, respectively, that: “I'm still trying to get camp up and running here” and “My research area is

assessment, so I focused on assessment”. From those who answered yes, four sub-themes emerged within the broad theme of research: *publication, topics, co-authors, and barriers* (Figure 3).

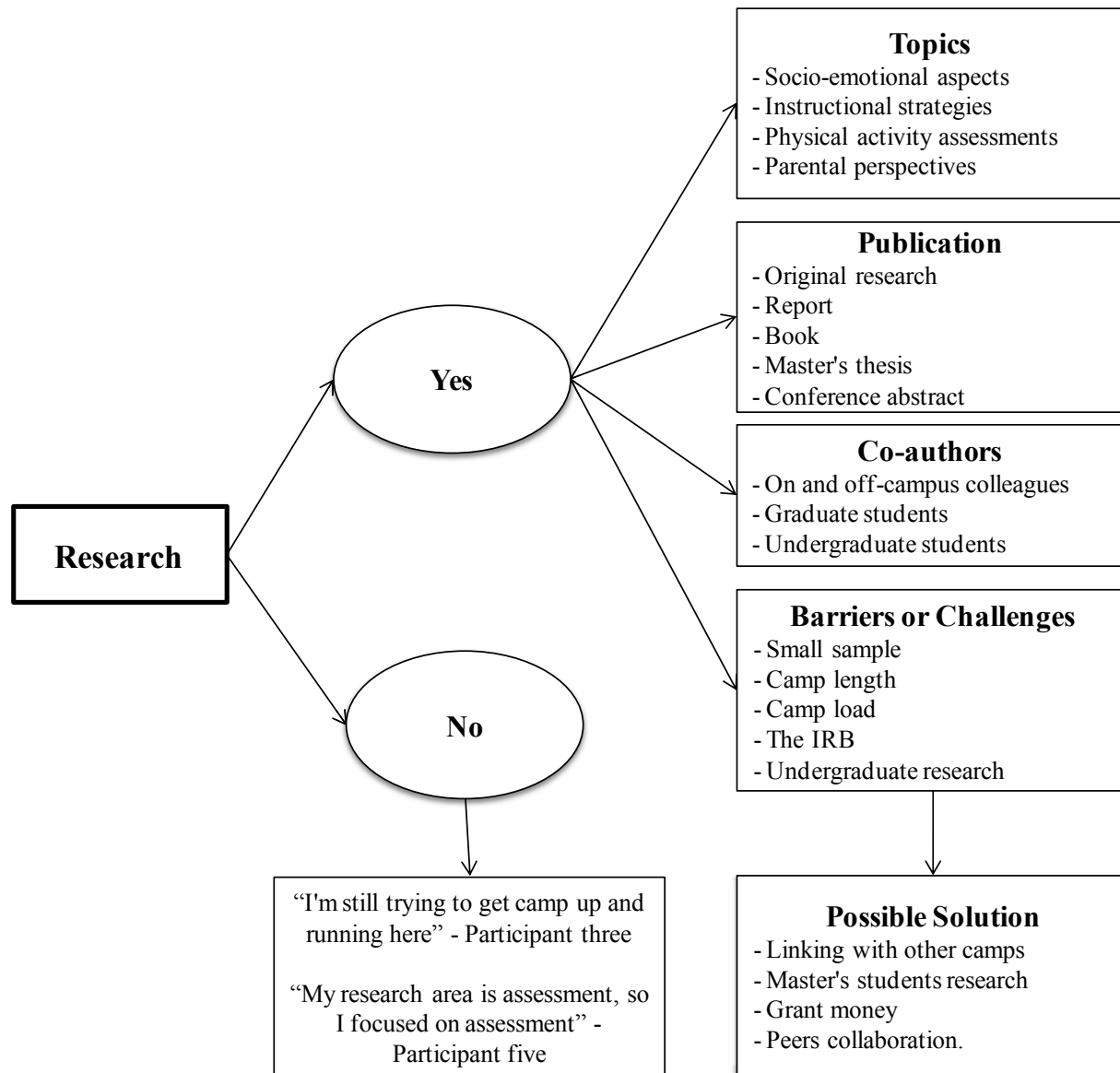


Figure 3: Visual representation of the theme research. IRB = internal review board.

Overall, participant five was responsible for most of the camp-related peer reviewed publications - 22 articles. Publication from this and other participants also included case reports,

conference abstracts, and books (pertaining to VI pedagogical aspects and a book on how to start a camp). The research stemmed from collaboration with on and off-campus colleagues, graduate and undergraduate students. The most common topics addressed in the research comprised socio-emotional outcomes of camp attendees; sport or physical activity instructional strategies for youth with VI; physical activity and motor development status; and parental perspectives.

Although camp can be a fruitful opportunity to do research, a number of barriers have been identified from the data. One issue refers to the small number of children and youth taking part in camp, which becomes more pronounced when their heterogeneous characteristics are considered (i.e. gender, age, and VI classification). Another matter related to the limited available time (ranging from three to seven days), since camp is already fully scheduled with the program activities. Furthermore, it was acknowledge the challenge to get the research project approved by the IRB and to have only undergraduate students involved in research projects.

Service

A third recurring theme that emerged is service. For cases six and seven, camp is linked to an undergraduate or graduate class in a physical education course (or related courses such as kinesiology, sport studies), thus being here categorized on a service-learning perspective (Figure 4). In this situation, coaches of children or youth with VI have to be regular students, unless there are more kids than coaches, when on or off-campus volunteers are allowed to participate. On the other hand, when camp is not associated with a course class (cases one to five) or when students can opt to apply for practicum credits (cases two, four and five) we fit it into the faculty consulting category, another aspect of external service. It is important to note that even when off-campus volunteers collaborate as coaches the majority of them were graduated or were physical education or adapted physical education students.

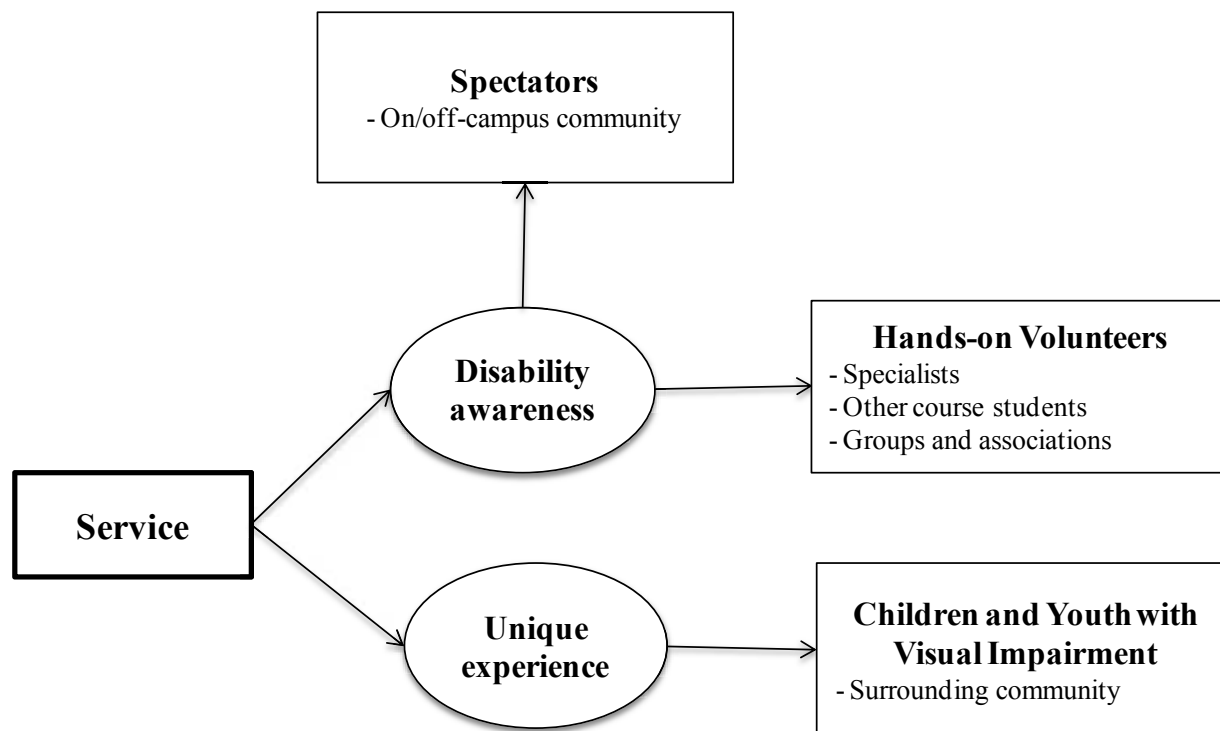


Figure 4: Visual representation of the theme service.

Within the theme service, two reoccurring sub themes were found: *disability awareness* and *unique experience*. The first sub theme included two main groups of people who were captivated by curiosity or seeking for a civic engagement opportunity. Some faculties expressed that camp activities were positive to raise attention of spectators on-campus to children with VI. Participant two said “we go to the cafeteria, we move around, we do activities, and everybody who comes around will see us, and they will say, what's happening here?... Everybody's really impressed”. In regard to the off-campus community, participant five explained that by having kids with VI riding a conference bike in the surroundings of the university, it “provides people in the community with a bigger awareness of visual impairment”.

The disability awareness sub theme also embraced a civic engagement opportunity for groups of hands-on volunteers. These groups included visual impairment and adapted physical education specialists, on-campus students (other than physical education students), parents of campers and members of local organized groups and associations. A second sub theme that emerged was the unique experience of children and youth with VI who participated in a sport camp specifically designed for them. For example, participant seven says a meaningful aspect of running Camp was,

...seeing the campers having such a good time and developing and growing during the week. They've even set up Facebook pages where they keep in touch with each other, and just to see the friendships that have blossomed and the different things that they go on and do. You can really see that you've had an impact, a positive impact on somebody's life.

Discussion

The purpose of this study was to investigate the impact of running a sport camp for children and youth with VI on adapted physical activity faculty roles'. Regardless of participants' characteristics our results indicate a clear benefit on their teaching and service activities, whereas the outcomes on the research area is not so evident, and seems to rely on factors such as camp characteristics (p.e.: partnerships, starting year, number of participants) and personal motivation.

Teaching a specific subject should require a good wealth of knowledge, often derived from theory (e.g., text books, evidence-based practice guidelines), and enhanced from practical, real-world experiences (Fry, Ketteridge, & Marshall, 2008). In this way, directing a sport camp for children with VI was reckoned to empower participants, not only to increase disability understanding, but also to teach using examples anchored in real life situations, which was mentioned to give them more credibility in class. Although not assessed in this study, most likely these benefits would occur in the first years of running the camp, following the characteristic

learning-curve pattern. Therefore, long term professional development goals could help to keep directors engaged in this demanding task, and could include teaching others how to run camps, working with other agencies or organizations to produce accessible equipment and encouraging students to go into the field of visual impairment among other long term projects.

In this study the participants reported high learning expectation to students participating as coaches. The one-on-one instruction, a rule for CA, provides a unique opportunity to train and prepare future professionals such as teachers for those with VI, adapted physical education teachers, physical education teachers, and sport coaches (Lieberman, Lucas, Jones, Humphreys, Cody, Vaughn, & Storms, 2013). Recently, Roper and Santiago (2014) reported that the hands-on aspect of a service-learning project was beneficial to promote positive attitude changes and to develop undergraduate kinesiology students' interpersonal and problem solving skills for working with students with disabilities in a physical activity setting. Previous study done at CA has also showed that immersion in a sports camp practicum improved attitudes of pre-service teachers toward children with VI and deafblindness (Lieberman & Wilson 2005)

Plausibly, there is a continuum of activities influencing students' attitudes towards disability, in which camp engagement can assume one of the higher ranks. This continuum would begin with in-class disability concepts and simulations (Leo & Goodwin, 2014), then would evolve to hands-on experiences within university adapted physical activity classes, and would proceed to immersion in experiences more closely related to their profession, such as summer camps (Ellis, Lepore, & Lieberman, 2012) or Special Olympics (Diacin & Vansickle, 2014). Overall, positive outcomes are likely to occur to all groups of coaches. However, those performing activities as part of a course (service-learning) are expected to benefit more when compared to those working as volunteers or to earn practicum credits (Astin, Vogelgesang, Ikeda, & Yee,

2000), and it could be explained by the deliberate emphasis on reflection, which is distinctive in service-learning approaches (Diacin & Vansickle, 2014).

Based on our analysis, we further identified several teaching outcomes which could be matched to most of the principles for good practice in undergraduate education proposed by Chickering and Gamson (1987). These outcomes included: (a) frequent out-of-class contact between students and faculty throughout the length of camp; (b) situations of reciprocity and cooperation among students working in small groups and in diverse activities; (c) active learning, when coaches had the chance to instruct, reflect, and write about it; (d) prompt feedback on coaches performance; and (e) emphasis for time on task in a very tight camp's schedule. Nonetheless, these outcomes were more frequently observed in camps using a service-learning approach than in those having coaches working for practicum credits or as volunteers. While the high load of activities, very common in these camps, served to provide leadership opportunities for some students performing a camp organization role, it also seemed to be a source of concern and anxiety to new directors, who wanted to get camp up and running before becoming more committed to teaching or research outcomes.

Coincidentally or not, the older and bigger camp (case four) was responsible for most of the research developed among camps. Whilst many factors may play a role in the determination of the quantity of research developed in such a particular setting, based on our results we postulate that camp maturity, directors' aptitudes (internally driven to conduct research), partnership with other faculties, and collaboration with graduate students are key elements in designing and conducting a research project in such a short and tight schedule. For example, participant four along with other three faculty from the same department and one director from another camp (case one) received a specific grant to develop a multi-site investigation. With the collaboration of graduate and undergraduate students, the researchers were able to assess the health related fitness status of 152

children with VI aged 10-17, in five different camps throughout the United States of America (Lieberman, Byrne, Mattern, Watt, Fernandez-Vivo, 2010). This collaborative strategy was positive to enhance study validity by increasing its statistical power, a common issue in quantitative disability research, due to the small samples typically available, and may be a desirable approach for future studies.

Our study detected that while some studies done at camps were published in congress and symposiums, providing little knowledge to the international audience, they are an outstanding opportunity for undergraduate and graduate students to develop intellectual and scientific skills. On the other hand, other research published in specialized peer reviewed journals are among the most cited literature regarding the field of physical activity for children and youth with VI, collaborating to the creation of a specialized body of knowledge useful to researchers and practitioners (Lieberman & McHugh, 2001; Lieberman & Robinson, 2004; Hand, Lieberman, & Stuart, 2006; Shapiro, Moffett, Lieberman, & Dummer, 2005). Nonetheless, the level of evidence derived from those investigations is still to be determined.

Reid, Bouffard, & MacDonald, (2012) have recognized the challenge to determine what works in adapted physical activity as research may be constrained by the multifactor complexity with numerous variables and interactions at several levels. We recognize that low sample size, heterogeneity of participants (e.g., gender, age, visual impairment classification), and program's short duration are common issues of this one-on-one instruction sport and recreation situation. Thus, the transferability of research outcomes to other physical activity settings are not fully understood.

The development of a CA, here characterized as a service delivery model (Haegele, Lieberman, Lepore, Lepore-Stevens, 2014), represented a means for faculty to perform their external service roles. According to Ward (2003) by “making teaching and research relevant and

connected to community and societal needs” (p. 69) faculty are supporting their institutional missions of public service. The participants of this study reported the institution’s administrators recognized their entrepreneurship efforts. Administrators usually mentioned the beneficial gain to the image of the institution and, conceivably as a result, kept supporting camps either by providing access to facilities, to financial, or to human and material resources. From a career promotion perspective, since running camps had a direct relationship to faculty disciplinary expertise, it was viewed as a service role, either way through faculty consulting or service-learning.

Examining the mission statements of the CA explored in this study, we found their main goal to empower children and youth with VI to be physically active and dynamic members of their schools, communities, and society in general. While the outcomes for campers seems to go beyond the mere development of sports knowledge and skills, and may include experiences of group membership and shared emotional connection to peers (Goodwin, Lieberman, Johnston, & Leo, 2011), additional outcomes can affect the broader societal context. Although the camps are segregated in nature, we believe it can favor social inclusion due its effect on disability awareness and positive intergroup contact between hands-on volunteers and spectators with children and youth with VI playing sports or during ordinary activities, such as walking with or without a guide, having meals, or even washing hands (Pettigrew & Tropp, 2006). In addition, every sport totally includes each participant which is more inclusive than most “inclusive” camps. However, to what extent those people are affected in regard to their attitudes towards people with disability is a topic for future studies.

We reckon that it would be interesting to establish the impact of running a camp for children and youth with VI on faculty members’ career progression. We also understand it was a very complex task to be accomplished, because of the variety of faculty tenure status (i.e. two lecturers, two associate and three full professors), along with the need to scrutinize each

institution's tenure criteria, which was beyond the purpose of this study. This task requires a much deeper involvement with further data and can be the aim of a future investigation.

Conclusions

In this exploratory multiple case study we highlighted several outcomes from running a sport camp for children and youth with VI. Regarding the teaching role, the directing experience empowered faculty members by improving their disability knowledge and by allowing them to teach using real life examples, which would give them more credibility in class. The expected outcomes for coaches-students included the application of theory to practice, attitudinal changes, and frequent out-of-class contact between students and faculty throughout the length of camp. As for the research role, although the published studies helped to create a specialized body of knowledge about physical activity for children and youth with VI, the outcomes were not shared by the majority of participants and seemed to rely on aspects such as camp maturity, directors' aptitudes, partnership with other researchers, and collaboration with graduate students. In turn, running the camp was a means for faculty members to perform their external service roles, either by consulting or on a service-learning approach. Finally, the exact impact of directing a summer camp for children and youth with a given disability on adapted physical activity faculty members' progression career is still to be determined. Nevertheless, the present study provided valuable information to faculty members willing to consider a service program as a part of their long-term professional development plan.

Final Considerations

The research purposes of each of the three articles presented in this PhD Dissertation were thought to be structured in a logical sequence. From a systematic literature review we identified 18 interventions on structured exercise-training, leisure-time-physical-activity and instructional strategy, with promising proposals to engage and instruct children and youth with VI, leading to an active lifestyle. While most of these studies were developed worldwide, some of them were conducted at CA, a sport summer camp developed at the State University of New York: The College of Brockport. In this place, we engaged in a one year doctoral internship, in which we developed a two-fold qualitative research design.

With the focus on (1) understanding the characteristics of CA and its potential to be further replicated, and (2) the possible outcomes of running this camp on faculty members' roles, we designed two multiple case studies.

In the first study, we detected two main aspects in the CA characteristics: the participants involved and the camp design. We found that the seven camps studied were often run at university's campus, where undergraduate and graduate physical education students have the role of instructing campers and eventually help in the camp organizing process. These camps attended a minimum of 30 to more than 120 participants (directors, campers, coaches, and specialist) each edition, lasting from four to seven days. In this scenario, although each camp has its own particular feature, common activities and schedules are shared among them, showing that CA is a feasible and reproducible approach, which can provide enriching opportunities to diverse groups.

Regarding the second case study, the outcomes found for those faculty members who run a CA were determined based on their institutional roles. Concerning the teaching role, the directing experience empowered faculty members by improving their disability knowledge and by allowing them to teach using real life examples, which would give them more credibility in class. The

expected outcomes for coaches-students included the application of theory to practice, attitudinal changes, and frequent out-of-class contact between students and faculty throughout the length of camp. As for the research role, although the published studies helped to create a specialized body of knowledge about physical activity for children and youth with VI, the outcomes were not shared by the majority of participants and seemed to rely on aspects such as camp maturity, directors' aptitudes, partnership with other researchers, and collaboration with graduate students. In turn, running the camp was a means for faculty members to perform their external service roles, either by consulting or on a service-learning approach.

The results of these three studies shed light on novel information related to CA and physical activity for children and youth with VI. We, therefore, hope our dissertation provides relevant information to visual impairment practitioners and adapted physical activity faculty members, and further enrich this field of knowledge.

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Appendix

Appendix A - Questionnaire

If you are not sure how to answer any of the following questions, please leave it blank. During the interview it will be explained.

The Professor

1. Are you hired on a tenure track?
 - a. If yes, what is your position/status?
2. Education:
 - PhD/EdD (date, university, program):
 - MS/MA (date, university, program):
 - BA/BSc (date, university, degree/major):
3. Area(s) of Specialty:
4. Research Interest(s):
5. Name of course(s) taught:
 - Undergraduate:
 - Graduate:
6. Please include any other professional background information, other than academic:
7. Please attach reference and/or link of any research conducted in your Camp Abilities by you or any other researcher?

The Camp

8. Starting year of Camp Abilities:
 - a. Have it occurred every year since then?
9. If Camp Abilities is not held at University' campus, please specify where it takes place.
10. What is the annual average number of participants in the Camp?
 - Youth with visual impairment:
 - Counselor/coaches:
 - Specialists:
 - General staff:
11. Where do youth with visual impairment come from?

12. Where do counselors/coaches come from?
13. Where do specialists come from?
 - a. Were any of them your student?
14. Where do general staff come from?
15. Are there paid positions at the Camp Abilities? If yes, which of them?
16. “Who” funds Camp Abilities?
17. What are your responsibilities as Director of Camp Abilities?

The University/College

18. Regarding the Professor career progression at the University where you work, what is the weight given to each of the following activities:
 - Teaching:
 - Research:
 - Service:

Appendix B - Interviews

General

1. What were the reasons to start the Camp Abilities?

Teaching

2. How can your students participate in Camp Abilities?
 - a. Do they need to take any of your classes previously?
3. What is the ratio of your students that participate in Camp Abilities?
4. Do they receive practicum credit for participating in Camp Abilities? Or any other advantage?
5. What do you expect students involved in Camp Abilities to learn?
6. Do counselors have a training before Camp Abilities? Is it similar to that given at Camp Abilities Brockport? IF NOT, can you describe me how it is?
7. Do counselors/coaches are assessed and receive feedback for their participation in Camp Abilities? IF YES, how?
8. Do you think students evaluate your courses better after having participated in Camp Abilities? Why?
9. Because of Camp Abilities do you have any contact with students other than in class? What kind of contact ? Do any of them assist you with the organization of Camp Abilities?
10. Do you know if they are more likely to work with people with VI or any other disability in their future career?
11. Do you consider that running a Camp Abilities helped in your professional development as a teacher? How?

Research

12. If did research related to Camp Abilities
 - a. Who was involved?
 - i. Undergraduate student
 - ii. Graduate student

- 1. Did students receive scholarship?
 - iii. Faculty (same university)
 - iv. Faculty (different university)
- 13. Do you have any other scholar production related to Camp Abilities such as:
 - a. Conferences presentations
 - b. Book or book chapter
 - c. Inventions, patents, and copyrights
- 14. What are the challenges of developing research in this setting?
- 15. Generally, which are the benefits of developing research related to Camp Abilities ?
 - b. Career
 - c. Personal

Service

- 16. Do you think that running a Camp Abilities have influenced your relationship with other faculty? How?
- 17. Is community off-campus involved in Camp Abilities? How?
- 18. Based on your perception does Camp Abilities have any impact on community in general or in University's community? How?
- 19. What organizations do you partner with?
- 20. If Camp Abilities activity is not related to candidate's disciplinary expertise, ask if it serves for career progression!
- 21. Do you consider that because Camp Abilities is held at the University where you work it plays a role in students' enrollment decision? Is it acknowledge by your institution?

General

- 22. Overall, how important has been running Camp Abilities to your career progression?
- 23. How your Camp Abilities have changed along the years?
- 24. Do you agree that running a CA is so much extra work? For you what are the most meaningful aspects of it? Why?

Appendix C - Invitation Letter

Dear colleague,

I (Lauren) and Otávio Furtado (Brazilian PhD Student) are conducting a study to investigate the influence of running a Camp Abilities on Professor's teaching, research and service activities. We are looking to interview all Professor that run a Camp Ability. We hope that you are willing to fill out a short questionnaire (15-30 minutes) and be interviewed (30-60 minutes) by Skype (preferable) or phone.

This research has been approved by The College at Brockport - SUNY Institutional Review Board.

Please find attached the Questionnaire and the Informed Consent. Once you answer the questions, please e-mail it back to us with the signed Informed Consent. We will then contact you to schedule the interview, that will be conducted by Otávio.

Thank you very much! I look forward to hearing from you!

Lauren Joy Lieberman; (585) 943-2829; llieberm@brockport.edu;
Otávio Furtado; (585) 201-9359; otaviofurtado@hotmail.com; Skype: otavio furtado

Appendix D - Statement of Informed Consent

The purpose of this research project is to investigate the influence of running a Camp Abilities on Professor's teaching, research and service activities. This research project is being conducted in a partnership with investigators from the Department of Kinesiology, Sport Studies, and Physical Education at the College at Brockport, SUNY and the Department of Adapted Physical Education at the State University of Campinas – Brazil.

In order to participate in this study, your informed consent is required. You are being asked to make a decision whether or not to participate in the project. If you want to participate in the project, and agree with the statements below, please sign your name in the space provided at the end. You may change your mind at any time and leave the study without penalty, even after the study has begun.

I understand that:

1. My participation is voluntary and I have the right to refuse to answer any questions.
2. There will be no benefits because of my participation in this project. There is a minor risk in the time that it takes to complete the interview.
3. My participation involves answer a questionnaire with 18 questions, and being audiotaped during an interview. It is estimated that the questionnaire will take 15-30 minutes and the interview 30 to 60 minutes.
4. I will be audio taped, and the researcher will transcribe the audio tapes. There will be no way to connect me to my responses. If any publication results from this research, I would not be identified by name.
5. Approximately 8 people will take part in this study. The results will be used to achieve a better understanding of the influence of running a Camp Abilities on Professor's teaching, research and service activities.
6. Data, audio tapes, and transcribed notes will be kept in a locked filing cabinet by the investigator. Only the principal investigator and the second investigator will have access to the tapes and corresponding materials. Data, audio tapes, transcribed notes and consent forms will be destroyed by shredding when the research article has been accepted and approved.

I am 18 years of age or older. I have read and understand the above statements. All my questions about my participation in this study have been answered to my satisfaction. I agree to participate in the study realizing I may withdraw without penalty at any time during the survey process.

If you have any questions you may contact:

Primary researcher	Second researcher
Dr Lauren Joy Lieberman	Otávio Luis Piva da Cunha Furtado
Department of Kinesiology, Sport Studies, and Physical Education. The College at Brockport - SUNY Phone: (585) 395-5361	Department of Adapted Physical Education at The State University of Campinas – Brazil. Phone: (585) 201-9359
llieberm@brockport.edu	otaviofurtado@hotmail.com

I agree to participate and understand that I will be audio taped.

Signature: _____

Date: _____

I agree to participate, but do not agree to be audio taped.

Signature: _____

Date: _____

Appendix E - College at Brockport Institutional Review Board

Letter of Approval



Date: September 19, 2013
To: Lauren Lieberman
From: Kristin Dauenhauer
IRB Compliance Officer
Re: IRB Project # 2013-15

Project Title: The Integration of Teaching, Research and Service in a University-based Sport Summer Camp for Youth with Visual Impairment

Your proposal "The Integration of Teaching, Research and Service in a University-based Sport Summer Camp for Youth with Visual Impairment" has been approved effective September 19, 2013.

You must use only the approved consent form or informational letter and any applicable surveys or interview questions that have been approved by the IRB in conducting your project. If you desire to make any changes in these documents or the procedures that were approved by the IRB you must obtain approval from the IRB prior to implementing any changes.

If you wish to continue this project beyond one year, federal guidelines require IRB approval before the project can be approved for an additional year. A reminder continuation letter will be sent to you in eleven months with the specific information that you will need to submit for continued approval of your project. Please note also that if the project initially required a full meeting of the IRB (Category III proposal) for the first review, then continuation of the project after one year will again require full IRB review.

Please contact Kristin Dauenhauer, IRB Compliance Officer, Grants Development Office, at (585) 395-2779 or kdauenha@brockport.edu **immediately if:**

- the project changes substantially,
- a subject is injured,
- the level of risk increases
- changes are needed in your consent document, survey or interview questions or other related materials.

Best wishes in conducting your research.

Appendix F - Sample of a meta-matrix.

The People	Participant 1	Participant 2	Participant 3	Participant 4	P
The Directors	See table A3				
Reasons to start	I already did camps with blinds in Costa Rica, but not in a Campabilities format, not the same but I had done two days, small things and then in Colombia. we had a Skype conference with Lauren and we started to plan and that was the time that the first campabilities took place here that Lauren came, Lauren came in that occasion and then we started the first camp in 2011 and then in 2012.	We went there (Brockport) the first year as volunteers, and the second year I was on the swimming staff, and Margarita was a counselor. We loved it so much that as soon as we were done with our PhDs we started working towards doing it here in Puerto Rico,	I had been here for five years (at the university) but only when I got my feet grounded here and made some connections to start camp. I Had participated in another camp before (Tucson). There are plenty of children in this area, and there was really no such thing as Camp Abilities (here), so I decided to start it.	Children with visual impairments need an opportunity to learn how to do after school and Paralympic sports. they also need to learn how to modify and accommodate their needs. secondly we need to train future teachers how to teach children with visual impairments, third, we need to conduct much needed research, and lastly we provide a week of respite for the parents.	We are people 10 years Abilities We had 10 years Camp / started then we and then I was a we ran
Responsibilities	Coordinate with the University authorities, dates, accommodation, sports facilities, food. Coordinate and guide the general staff responsibilities in programming, inviting campers, volunteer recruitment, documentation. Coordinate with instructors of sports and other camp activities. Writing of final results for Social Action Vice-Rector of the University of Costa Rica.	Funding, schedules, day to day activities, food, lodging, cleaning. Everybody helps in everything		I FUND RAISE, PLAN FOR THE ATHLETES, THE COACHES, HIRE STAFF, CONDUCT RESEARCH ASSESS THE PROGRAM AND DIRECT THE CAMP THE WEEK OF CAMP	Facilitate University graduates students students class during undergr students
Shared responsibilities	I have a small group of boys who are my main staff. With them I organize the camp. As Director I communicate with the university authorities regarding campus security, accommodation, and food. I communicate to university director and managers our schedule the things we'll need for camp. all the logistics, we call this way, the transfer, because we are away, we're an hour and a half from the city. Then we need transport to take the blind who are not from the neighborhood, we need to take them to the camp. The university has the busses to carry the kids and for this I have a group of boys who are students too. I also have a sports director. I had an advanced student who helped me a lot. I have a group of volunteers for 2014 and they are the ones working all the time with the preparation of these fundraising activities	we always find one or two students that may help us for free	graduated students who helped funding CA	I ALSO WORK WITH MY 2 GRADUATE STUDENTS ALL YEAR LONG	There's and org There's have a Hanser two ass Woman Camp / them ge camp. I facilities rooms a people I everythi

Appendix F – (continued)

4	Participant 5	Participant 6	Participant 7	Assertion/proposition
eed an er school eed to learn their needs. achers how ments, third research, spite for the	We already had a camp for people with visual impairments for 10 years, and it was not called Camp Abilities. It was called Camp Life. We had the same exact concept for 10 years. We tried to merge it with Camp Abilities because we just started running out of funding, and then we took a couple of years off, and then Camp Abilities came about. I was a big part of that one, but then we ran out of funding.	Had participated in another camp before (Brockport). I started for my own students, that they would all have the experience instead of just a few of them. It is important for the college students. There wasn't a sports camp for the kids.	We had met Lauren, and we had heard about Camp Abilities. And also Nieve, who works in the Cara Center, had been a volunteer at one of the camps in the U.S. In Ireland there was very little opportunity for people, in particular children with vision impairments, to get involved in sport. There was only things for adults. The reason for camp is twofold: it's for the education of the students, but it's also to encourage young children to get involved in sport	The participant number four, founder of CA, said camp was created to meet four purposes. First, children with visual impairments needed "an opportunity to learn how to do after school and Paralympic sports. They also needed to learn how to modify and accommodate their needs. Second, because there was a need to train future teachers how to teach children with visual impairments. Third, we need to conduct much needed research, and lastly we provide a week of respite for the parents. Before starting their own CA, three of the Directors had themselves volunteered in a CA, two had a co-director volunteered and shared the experience, and in one circumstance the director had heard of CA in a Conference, contacted the founder of CA, and received directions of how to start the camp. As stated in CA websites, all cases shared the same purposes of the original CA, except for the research purpose.
HE HIRE CH DIRECT AMP	Facilitate collaboration with University facilities. Recruit graduate and undergraduate students to volunteer. Advise students in Adapted PE track to take class during the summer – both undergraduate students and graduate students.	Fundraise, hold planning meetings, direct month to month activities to make camp happen, oversee sports, equipment, volunteers, food, certificates, schedules, etc. I do everything but coach a sport I have the final say, and I'm the boss, yes	the planning, organization and running of the camp	Except for participant five who is responsible specifically for facilitating the collaboration with University facilities, recruiting and advising graduate and undergraduate students volunteers, all of the other directors are involved with the process of planning, organization and running of the camp. The process which also includes fundraise, oversee ATHLETES, COACHES, volunteers, paid staff, sports, equipments, food, accommodation, certificates, schedules. In participant six "I do everything but coach a sport". Only cases four and six report to conduct research at camp in a regular basis.
RADUATE G	There's a team that does it (planning and organization of Camp Abilities). There's a team of people. We have a local school district. Lisa Hansen is in charge, and she has two assistant. They are using Texas Woman's University as the site for Camp Abilities. My role is to help them get the volunteers to run the camp. I only have to take care of the facilities and the equipment and the rooms and work with the university people here to make sure that everything is all lined up	it's run by a panel of five students, and they're the ones that do all the fund raising, the facilities, everything	there are two directors to the Irish camp: There is myself, from the college; and then there is Nieve from the Cara (adapted physical activity center), so we actually jointly organize. We would have set up committee the first year, and I suppose within the Cara Center there was other staff there as well that would have worked, so there was two other staff in the Cara Center that helped. Then we had myself from the college; we also had somebody from that Sporting Chance program, and we had somebody from the National Counsel for the Blind involved as well. I suppose that committee has grown over the years. an undergraduate also receive a four-month internship to help in camp organization.	In three camps the directors are helped by undergraduate or graduated volunteers students. In one camp two graduate students receive a one-year scholarship and in another camp one undergraduate also receive a four-month internship to help in camp organization. In the other two camps there is team (people involved in organizations for people with visual impairment and assistants) working together to run camp.