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Instructional Preferences in Aquatics for Children with Visual Impairments and Blindness

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PREFERÊNCIAS INSTRUÇÃOAIS EM NATAÇÃO POR CRIANÇAS COM DEFICIÊNCIA VISUAL E CEGUEIRA

INSTRUCTIONAL PREFERENCES IN AQUATICS FOR CHILDREN WITH VISUAL IMPAIRMENTS AND BLINDNESS

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RESUMO: no desenvolvimento de habilidades motoras, crianças com deficiência visual (CDV) estão aquém de crianças com visão. A natação é um esporte que muitas CDV apreciam e têm sucesso, porém, é particularmente difícil de se ensinar a esse grupo. O objetivo desse estudo foi determinar qual estratégia de ensino as CDV preferem durante as aulas de natação. Treze CDV e quatorze treinadores participaram de entrevistas em grupos focais sobre suas preferências depois de uma semana de aulas de natação. Uma abordagem temática foi utilizada para assegurar que a análise fosse conduzida de uma maneira teórica e metodológica. Dois temas principais foram identificados em cada categoria: assistência física, modelagem tátil e estratégias de ensino. A primeira estratégia de ensino, *assistência física*, incluiu os temas processo de aprendizado mais rápido e movimento passivo. A segunda estratégia, *modelagem tátil*, teve como temas as barreiras e melhor instrução. *Estratégias de ensino* originaram os temas depende da situação e comentários da criança. As estratégias de ensino utilizadas durante a natação variam de acordo com a tarefa ensinada, a experiência prévia da criança, o tamanho e experiência do treinador e as preferências do aluno. Professores e treinadores deveriam discutir sobre as tarefas que serão realizadas e as preferências instrucionais dos alunos antes das aulas. Eles também deveriam levar em consideração as variáveis experiência prévia da criança, tarefa a ser executada e tamanho e experiência do treinador.

PALAVRAS-CHAVE: Natação. Criança com deficiência visual. Cegueira. Preferência Instrucional.

ABSTRACT: Children with visual impairments (CWVI) are developmentally behind their sighted peers in motor skills. Swimming is a sport that many CWVI enjoy and experience success, but unfortunately swimming is particularly complex to teach CWVI. The purpose of this study was to determine which instructional strategies CWVI prefer during swim instruction. Thirteen CWVI and fourteen coaches participated in qualitative focus group interviews on their preferences after a week of swim instruction. A thematic approach was utilized to ensure the analysis was undertaken in a theoretically and methodologically sound manner. The results showed that two key themes emerged from each category: physical guidance, tactile modeling, and teaching strategies. The first teaching strategy, physical guidance, included themes *quicker learning process* and *passive movement*. The second teaching strategy, tactile modeling, was comprised of the themes *barriers* and *better instruction*. Teaching strategies included the themes *depending upon the situation* and *child feedback*. Instructional styles used in swimming depended upon the skill being taught, the previous experience of the child, the size and experience of the instructor, and the preference of the student. Instructors should discuss skills being taught and instructional preferences to the student ahead of time. They should also take into consideration the variables of skills being taught, the child's previous experience, and the size and experience of the instructor.

KEYWORDS: Aquatics. Children with visual impairments. Blind. Instructional Preferences.

INTRODUCTION

Motor skill proficiency in CWVI is as important for daily living and sports activities as it is for any child. However, studies demonstrate that children do not engage in adequate levels of physical activity to promote healthy lifestyles (World Health Organization, 2010) and children with visual impairments (CWVI) are less physically active than their sighted peers (Houwen, Hartman & Visscher, 2009; Houwen, Hartman, Jonker

& Visscher, 2010; Lieberman, Byrne, Mattern, Watt & Fernandez-Vivo, 2010) and demonstrate less developed motor skills than their sighted peers (Wagner, Haibach & Lieberman, 2013).

Positive relationships have been found between motor skills and physical activity levels in children with increased physical activity levels positively influencing motor skill proficiency (Houwen et al., 2009). A good example of sport for CWVI is swimming, for a variety of reasons. Swimming provides an opportunity to

improve motor performance and physical fitness while increasing group interaction, self-determination, mobility, independence, and experiencing success (Lepore, Gayle & Stevens, 2007).

Instruction in swimming must be very carefully planned due to potential discomfort. A variety of instructional strategies can be used when teaching students with visual impairments, such as demonstration, verbal instruction, and tactile teaching (Lieberman & Cowart, 2011; Lieberman & Haibach, 2012; O'Connell, Lieberman & Petersen, 2006). Tactile modeling is an instructional strategy in which an instructor, paraeducator or a peer executes a skill, and the child who is blind feels their body go through the motion. This tactile inspection is an active form of learning enabling the child to feel the demonstration and acquire the necessary information to execute the skill him or herself. Physical guidance is a more passive learning style where the instructor, the paraeducator or a peer moves the child through the desired movement skills ranging from full physical assistance to a tap of the knee, elbow or hand.

For effective learning, teachers have to carefully choose which method to use depending on the student's learning preference and the motor skill(s) being taught (Downing & Chen, 2011; Lepore, Gayle & Stevens, 2007). Therefore, the purpose of this study was to determine the themes within the instructional strategies CWVI preferred during swimming classes.

METHODS

CWVI and their instructors were interviewed about their experiences with swim instruction. A used phenomenological method, qualitative approach that was descriptive, reflective, and interpretive in nature, and that, was used to describe underlying feelings toward each instructional technique (Creswell, 2006).

PARTICIPANTS

The participants were recruited from a residential summer sports camp held in the northeastern United States. An invitation letter was given to 21 children who attended the camp and their families. Inclusion into the study required the participants to be between nine and 14 years of age with a visual impairment significant enough to warrant tactile instruction in swimming. Parents and the participants signed informed consent forms. Thirteen children (four girls and nine boys) participated in four swimming classes with each class lasting one hour. Children were divided into three groups according to their swimming levels that were previously assessed. Participants were assessed with the Red Cross swimming assessment which resulted in six children being classified in the beginner level, six in the intermediate level, and one in the advanced level. According to the International Statistical Classification of Diseases (Dandona & Dandona, 2006), nine campers had blindness to limited light perception, the inability to recognize the shape of a hand at any distance or in any direction, or less than five degrees of vision (B1 level of vision according to International Paralympic Committee (2011)). Four campers had Low vision (B2 level of vision) which is described as a range from ability to recognize the shape of a hand up to visual acuity of 20/600. Children's demographic data can be found in Table 1.

Table 1 - Children' demographic data.

Gender	Age	Level of VI	Congenital Impairment	Progressive Yes or No	Swimming Skill Level	Teaching Preference
Male	9	B2	Yes	Yes	Beginner	PG
Male	9	B1	Yes	No	Intermediate	Both
Male	10	B2	No	No	Intermediate	PG
Male	10	B1	Yes	No	Beginner	TM
Female	10	B1	Yes	No	Beginner	TM
Female	10	B1	Yes	No	Beginner	PG
Male	12	B1	Yes	No	Advanced	Verbal
Male	12	B2	Yes	No	Intermediate	PG
Female	12	B1	Yes	No	Beginner	TM
Male	12	B1	Yes	No	Intermediate	PG
Female	13	B1	Yes	No	Beginner	TM
Male	13	B2	Yes	No	Intermediate	Both
Male	14	B1	Yes	No	Intermediate	PG

VI = Visual impairments

Fourteen swim instructors participated and confirmed their interest by completing informed consent forms. There were 14 instructors for 13 children because one athlete needed two instructors during camp. Instructors ranged in age from 16 to 35 years (nine female and five male). Each instructor participated in the camp orientation for a day and ½ that reviewed specific instructional techniques for children who are blind among many other instructional topics.

DATA COLLECTION

A phenomenological qualitative research design was used to answer the research questions of interest. Data collection included personal data sheets, semi-structured focus group interviews with the children and instructors, interview notes, observations in swimming classes by the researcher, and field notes. Pseudonyms were used for each child in the study.

The focus group questions were reviewed by a panel of experts composed of three professionals in the field of adapted physical education. Open-ended and experiential questions were used to increase the breadth of responses, such as: "How did your coach teach you – physical guidance, or tactile modeling?"; "Did your coach let you choose?"; "Which instructional style was your favorite and why?"; and "Which instructional style helped you to learn the most?" The semi-structured focus group with children was divided into two groups being sensitive to ages: a) six children ages nine and 10 years, and b) seven children ages 12 and 13 years. Two other focus groups were conducted with instructors. Small groupings provided an ample opportunity for each participant to have input, enabling children and instructors to elaborate on ideas generated by others (Vaughn, Schumm & Sinagub, 1996). Each group met with a focus group moderator for 30-60 minutes and the focus group interviews were audio-taped.

DATA ANALYSES

Transcriptions of focus group interviews were completed verbatim. Transcription responses were distributed to the research team members, who individually coded the data. Each member reviewed all of the material in an uninterrupted period to gain a sense of the totality of the data (Taylor & Bogdan, 1998). Braun and Clarke's (2006) guidance on carrying out the thematic analyses was utilized as it ensured analysis was undertaken in a theoretically and methodologically sound manner. Thus, initial codes were generated and quotes of interest were highlighted in the transcripts. After initial coding, research team members met to review emerging codes, discuss variations of codes, and review emerging themes. It was decided that there were two distinct themes within physical guidance, tactile modeling, and teaching strategies.

RELIABILITY

Frequent debriefing sessions amongst the researchers were conducted to discuss alternative approaches, draw attention to flaws in the proposed course of actions, provide a sounding board for the investigator to test his or her developing ideas and interpretations. This process also helped the researcher to recognize his or her own biases and preferences (Shenton, 2004).

TRUSTWORTHINESS

Four researchers reviewed the transcripts to determine themes and subthemes. This multiple perspective can support the trustworthiness of the data being analyzed. Frequent revisions were made during the analysis to account for the multiple perspectives and the final themes and subthemes were deemed most relevant to the research questions.

RESULTS

The purpose of this study was to determine themes within each instructional strategy that children preferred during swimming classes. The strategy of physical guidance had themes of *a quicker learning process*, and *muscle memory*. The strategy of tactile modeling had themes of *barriers* and *better instruction*. The area of teaching strategies had the themes of *it depends on the situation* and *child feedback*.

INSTRUCTIONAL PREFERENCES

In this study, the preferred instructional strategy for beginner swimmers was tactile modeling (four children) and physical guidance (four children) for intermediate swimmers. The only athlete that preferred verbal explanation in the group was in the advanced level. Given his experience and skill level, it was likely easier for him to understand and benefit from the verbal explanation.

The coaches' preferences were similar to children's preferences. The most preferred strategy was physical guidance with six coaches (42.9%), however, there were a variety of preferences by the other eight coaches. These results indicated the importance of being adaptable and knowing different strategies. If one strategy did not work as expected for a specific skill, coaches were able to teach the skill(s) or concept in a different way, enhancing the learning opportunities for the student.

The thematic analysis used for data analyses revealed two themes for a) physical guidance, b) tactile modeling, and c) teaching strategies. The sections below describe these findings with quotes from the participants and their instructors.

PHYSICAL GUIDANCE

Physical guidance was the instructional strategy preferred by the majority of coaches and children, preferred by six coaches (42.9%) and six children (46.2%). The teaching strategy of physical guidance included the themes *a quicker learning process* and *muscle memory*.

A quicker learning process: Physical guidance led to a quicker learning process during classes as stated by instructor Amy: "I definitely thought physical guidance was much better. Using tactile modeling, they can't remember as well as physical guidance. I found that physical guidance worked better just because he is moving." Coach Kelly supported it, "when I was physically guiding him, he was getting it all at once and he was engaged in it because he was doing it".

Passive movement: Physical guidance provides a passive manipulation of the learner. Some of the learners and coaches preferred this method asserting "When I was moving his body, he asked a lot less questions because he was doing it right away and he seemed to catch on faster". Although an effective strategy, it should be asserted that passive movements provide a decreased sensitivity over active movements (Brodie & Ross, 1985). When we move actively, there is a reference of correctness that is established between our movement and the intended movement, however, this does not occur in a passive movement. As such, it is important to intersperse physical guidance with attempts by the learner without physical guidance in order to establish these signals. The more the learner then practices the movement, the more engrained into muscle memory the movement will become for the learner.

TACTILE MODELING

Tactile modeling was another teaching technique discussed during focus groups, preferred by two coaches (14.3%) and four children (30.8%). This instructional strategy required detailed planning on the part of the instructor and extra instructional time (Chen & Downing, 2006). Coach Erika commented, "With the tactile modeling, I did have to break it down, so it was a lot more work. We had to go over it in different ways, and I had to point out where to look."

Tactile modeling can provide effective instruction but there are barriers when using this instructional strategy to teach swimming. Themes were *barriers* and *better instruction*.

Barriers: A considerable number of barriers were revealed when using tactile modeling. One barrier described for coaches was the child's difficulty in understanding the whole movement. Coach Kelly noted, "It's hard to have them feel all of your body parts while you are doing it – when I was modeling it, I wouldn't think about what my feet were doing, so he wouldn't catch that". Coach Camilla agreed with her. "With the tactile modeling he never really understood where my arm was going".

Size differences between coaches and children were another issue while using tactile modeling. In this strategy, children can explore the model's body in a given movement, recognizing speed,

direction, and precision (Lieberman & Haibach, 2012; Lieberman, 2011; O'Connell et al., 2006). However, if the model is bigger than the athlete, he or she may not see the connection between them, or not be able to reach distant body parts. Coach Amy and Coach Bobby agreed about size differences: "Tactile modeling didn't work as well because of the size of the child" and "I think a problem with the tactile modeling was our limbs were longer because our athlete is shorter than us". Other instructors found it difficult, because they could not communicate with the athlete while completing some of the skills, such as floating.

Better instruction: At the same time that tactile modeling presented higher number of barriers, it encouraged more active learning where the locus of control was upon the student.

Coach Helen explained why she prefers tactile modeling:

"I put a kickboard under my stomach so I was able to float and she was able to feel me at the same time. And I moved and I had her feel the different parts, like here put your hand on my wrist. We are going to move that like that, now put your hand on my elbow, we are going to move that like that, okay now feel everything together. I felt more comfortable with her manipulating my body, instead of me manipulating hers where she felt vulnerable".

Coach Erika discussed a different point:

"I felt that tactile modeling was a lot more difficult to teach and it certainly required me to engage in the information I was teaching in a much greater depth, than I otherwise would have done but it felt like there was certainly more teaching and more learning from my point of view anyway".

Thus, while using tactile modeling, it was necessary to break down the skill in smaller parts, which required instructors to have more knowledge and familiarity with the skill being taught.

TEACHING STRATEGIES

The final area, teaching strategies, was a key discussion that arose in the interviews. Teaching strategies included the subthemes *it depends on the situation* and *child feedback*. Coaches used these subthemes during classes to decide what instructional style they used. Children also understood their role in the learning process and helped the coaches find the best way to proceed.

It depends on the situation: Teaching techniques are chosen depending on the situation was the first theme under teaching strategies. One example was the skill being taught. Instructor John varied the technique for each part of the stroke:

"I told him to throw the elbow back and hit something, he liked that. Then I had him feel me, asked him if he felt the elbow going back and how it moved and the shoulder bone popping out. There were moments where that didn't click for other parts of the stroke. So I used physical guidance with those parts, because it seemed to click better when I would move him through it."

Athlete Nathan (B2) explained why it is important being adaptable and understanding during classes.

"I would say that in general the best way to be taught for me would be all of them. Because it might not always seem clear when you do it verbally. People could use the same word but you could be thinking an entirely different thing than what your coach is trying to tell you. And it helps to go through the hands motion with them and if you still are having trouble, you could feel what they are doing."

The time of vision loss of the child is another situation that arose during the interviews. Coach Erika said "if they had any vision early in life, there are a lot of basic concepts that are just there from development that make huge difference in your ability to teach physical movement". Coach Helen exemplified this concept perfectly:

"My athlete kept spreading her fingers apart and I worked on how you can get more soup if your hands are closed more like spoons than like forks. You wouldn't eat soup with a fork. She didn't know that there were holes that went all the way down the fork. She just thought that they were at the top and you could pick things up. So we had to go through that and then go through how you scoop your hands like a spoon to push the water. Something like that doesn't have anything to do with physical education. If she had vision earlier in her life, if she saw a spoon, if she saw a fork, she would have that understanding."

Child feedback: Child feedback was another topic discussed while choosing teaching styles. Athlete James (B1) stated that his coach let him choose "He said that whatever you will be more comfortable or will help you succeed by doing it". Thus, his feedback was an important part of the teaching/learning process.

Instructor Helen and Diana described how they got feedback from children. "When I tried to teach her something and I would grasp her, she would shrink and squirm back, and she wasn't comfortable with that" and "If I was putting him through physical guidance, I could tell if he did not like it or he literally just tells me to stop". Coach Camilla completed: "I could tell right off the bat with his facial expressions and his body language that he really was uncomfortable with one way. So I would switch it out for him".

Coaches and children's preferences may not be the same. Sometimes it is necessary finding creative and different ways to please both sides and still teach in an effective way. Coach Ester said:

"Unfortunately with my athlete, physical guidance worked a lot better but his preference was tactile modeling. I would try to basically convince him into the physical guidance but there were some times that were difficult to try to win him in the tactile modeling that he liked."

DISCUSSION

According to Wagner, Haibach & Lieberman (2013), CWVI can perform gross motor skills as well as their peers with sight, but they just need to be given the opportunity and time. It is through a high variety of physical activity experiences that students' with visual impairments will learn and retain the necessary motor skills to be able to be physically active participants throughout their lifetime (Lieberman, Ponchillia & Ponchillia, 2013). The purpose of this study was to determine the themes within major instructional preferences for CWVI during swimming classes.

PHYSICAL GUIDANCE

The findings of this study showed that using physical guidance as an instructional strategy led to a quicker learning process. This supports the findings of O'Connell et al. (2006) who stated that the proprioceptive feedback from the tactile prompt will give the student the information needed to perform the skill correctly, increasing his or her understanding of it, and allowing the student to be aware of the correct form. Thus, physical guidance benefits the development of motor skills for CWVI.

Physical guidance has been shown to increase the success of CVIB in acquiring skills (O'Connell, 2000). This success is likely one of the reasons that physical guidance was the instructional strategy preferred for 46% of children and 43% of coaches.

On the other hand, when physical guidance is done too routinely and exclusively, it conditions the child with visual impairments to be passive, to wait for direction from the hands of another, and to avoid reaching out into the world for information and stimulation (Miles, 2003). Chen and Downing (2006) also cited another problem of using this strategy:

"Teachers and instructors must be aware that it may result in reluctance and resistance of some children to be manipulated. Physical guidance should be used gently, respectfully, and cautiously, given that the child may not actively participate and has little control over the process" (p. 88).

TACTILE MODELING

Tactile modeling is the inspection by a student of a demonstrator or an object by touch that can help the student learn and understand a skill (Lieberman & Cowart, 2011). This strategy presented more barriers for children and coaches. Some barriers were the difficulty of understanding the movement as a whole including arms, legs, head, and smaller parts such as finger position; size differences between coaches and children; and the challenges of holding a child above water while swimming as well as answering questions while submerged.

Although there are many barriers, tactile modeling increases the engagement of the children by providing them a more active role in the learning process. Tactile modeling gives the student control of the learning process by providing a choice of the specific components of a performance to focus on. Instead of being manipulated, the student can take the lead, feel the movement, and control the information input of the lesson (O'Connell et al., 2006).

TEACHING STRATEGIES

The discussion on preferred teaching strategies reflected the complexity of teaching. At times, instructors and coaches provide instructional support with or without sensitivity to children's preferences and feedback. This study presented important topics to help teachers and instructors decide which strategy to use for swim instruction for CWVI.

Teaching strategy choice may be situational, depending on the skill being taught, time of the child's vision loss, the child's level of visual impairment, and skill level of the child. It can depend also on child's feedback and preferences. It is important that students with a visual impairment are given the option to use one or the other method with each new skill, since they may have a preference for one or the other method at all times or for different skills (Lieberman et al., 2013).

Indeed, students should be provided with the necessary knowledge about different instructional strategies and experience each one of them. Students should learn from instructors and teachers which choices are available to them before they decide their preferences.

LIMITATIONS OF THE STUDY

This study was limited by a generally small sample size of participants. In addition, the education, experiences, and physical sizes of the coaches varied. The study was conducted over a five day period and focus groups were the only method used which could have been a limitation.

CONCLUSIONS

This study provided an in depth analysis of CWVI and coaches' preferences in swimming. Although the majority of the coaches and children preferred physical guidance, the interviews showed positive and negative aspects about each strategy.

An awareness of the issues raised will allow teachers to consider the views and preferences of students with visual impairments during swimming classes. In fact, the findings can be used in other areas of physical activity, motor skills, and fitness. Of particular significance are the situations and barriers that influenced the choices of the strategies for teaching individual children.

Results provide a background for teachers and professionals who work in the field and demonstrate the necessity to train staff about the various methods to available teach CWVI. Future research should examine the preferences and experiences of children/ learners with visual impairments in order to develop best practices to increase success by increasing physical activity levels and improving motor performance. These three instructional approaches and themes are worthy of discussion and may have implications for teachers, parents, and professionals in the Adapted Physical Education and Visual Impairment fields.

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