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Practice Report

The Use of Tactile Modeling and Physical Guidance as Instructional Strategies in Physical Activity for Children Who Are Blind

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To develop into healthy, physically active adults, all children need education in physical fitness, health, wellness, and lifetime sports and recreation (Ross, Lottes, & Glenn, 1998). Studies have indicated that children who are visually impaired (that is, those who are blind or have low vision) have lower levels of fitness and less well-developed motor skills than do their sighted peers (Buell, 1950a, 1950b; Daugherty & Moran, 1982; Jankowski & Evans, 1981; Lieberman & McHugh, 2001; Pereira, 1990; Ribadi, Rider, & Toole, 1987; Skaggs & Hopper, 1996; Skellenger, Rosenblum, & Jager, 1997; Winnick & Short, 1982). In fact, children who are visually impaired have various delays in motor skills and development (Dunn & Leitschuh, 2006; Hatton, Bailey, Burchinal, & Ferrell, 1997; Jan, Sykanda, & Groenveld, 1990; Troster & Brambring, 1993; Troster, Hecker, & Brambring, 1994). Hatton et al. (1997) found that the more visually impaired a child is, the slower the child's rate of development of motor skills. This area is of great importance to educators and caregivers because there is a strong association between motor development and emotional and behavioral deficits in children who are visually impaired (Ophir-Cohen, Ashkenazy, Cohen, & Tirosh, 2005).

Young children who are visually impaired often demonstrate delays in reaching developmental milestones, particularly in mobility- and locomotion-related behaviors (Sherrill, 2004; Sleeuwenhoek, Boter, & Vermeer, 1995). They also have delays in object control and manipulation skills, which can be delayed three to six months, along with delays in play and social skills (Kef, 1997; Kroksmark & Nordell, 2001; Sherrill, 2004). Children who are visually impaired and have no other disabilities are born with the same physical potential as their sighted peers, but for a variety of reasons often lack opportunities to reach their potential (Fraiberg, 1977; Lieberman, Houston-Wilson, & Kozub, 2002). Buell (1973) found that individuals who are blind expend more energy in movement in activities of daily living than do those who are sighted, therefore, increasing physical activity levels for people with visual impairments can truly benefit their health and help improve the quality of their lives (Skaggs & Hopper, 1996). The discoveries of Fraiberg and Buell suggest that finding pedagogical techniques to improve levels of motor skills of children who are blind may contribute to an enhanced quality of life for these children.

To improve motor skills of students, it is important for teachers to use effective pedagogical techniques, such as matching specific teaching styles and learning strategies to each child. Tactile modeling, physical guidance, and demonstration are modeling techniques that are used to help children who are visually impaired acquire such skills (Downing & Chen, 2003; Lieberman & Cowart, 1996). Modeling is a process in which observers attempt to reproduce the actions that another person performs (Lirgg & Feltz, 1991); it increases understanding of what an individual needs to do.

These techniques are valuable because once a skill is understood, children with visual impairments have a mental picture and generally know what to do on the basis of the model

(O'Connell, 2000), and research has supported the idea that individuals are successful in learning new motor skills by observing models (Rosenthal & Bandura, 1978). According to Bandura (1997), a motor skill can be learned through physical demonstration or pictorial or verbal instruction that describes exactly how to perform the given activity. He stated that the most effective way of transmitting information about skills is through proficient modeling.

Demonstration is another teaching strategy that can be used to teach motor skills to children with visual impairments. The strategy usually implies visual observation, but for students who are blind, it means that the instructor must facilitate the use of physical guidance or tactile modeling to relay the correct skill (Alberto & Frederick, 2000). It is important to note that physical demonstration techniques must be used along with verbal prompts, descriptions, and feedback that fits the level of the student's receptive language. Modeling the correct form, along with verbal instruction that is appropriate for the student, is essential when demonstrating a new skill (Lieberman & Cowart, 1996; Sherrill, 2004). If the proper form is not conveyed, a longer instructional time will be needed to reinstruct the student in the correct form. Successful demonstrations should be done with physical guidance and tactile modeling for children who are blind, so they can comprehend the skill or activity that is being taught (Downing & Chen, 2003).

The use of tactile modeling and physical guidance, when coupled with an explanation, were equally effective in increasing the self-efficacy of goalball participants who were blind (O'Connell, 2000). Goalball is an international sport played by athletes who are visually impaired. The sport was chosen for the O'Connell study because, for most of the participants, it was a novel activity. The fact that tactile modeling and physical guidance were effective allowed the instructor to determine the level of instructional support needed and to give that support without concern for one technique over the other. When instruction and demonstration (physical guidance and tactile modeling) are coupled with positive specific and corrective feedback, the acquisition of skills increases (O'Connell, 2000).

Teaching motor skills to students who are blind is a potentially intimate instructional situation. Unlike teaching groups of sighted children, teaching students who are blind is most successful when delivered one to one (Downing & Demchack, 2002; Wiskochil, 2002). Although one-to-one instruction is necessary for this method to be effective, it can be delivered in an inclusive or segregated class by a physical educator, adapted physical educator (a teacher who is responsible for the physical education of all the children with disabilities in a school district), trained peer tutor, trained paraeducator, or volunteer. The student who is blind can also be taught within a large or small group, during stations (different areas where different activities are set up), a game, or an individual activity. The remainder of this report describes the teaching techniques of physical guidance (the instructor physically assisting the student) and tactile modeling (the student physically exploring the instructor's execution of the skill), which are two important teaching techniques to improve the performance of motor skills by students who are blind.

Physical guidance

Physical guidance involves performing a particular movement with an individual to get the feel, rhythm, and motion of the movement being instructed. It includes physical placement of the student's body part involved in performing the skill so as to clarify the required movements of the skill (Auxter, Pyfer, & Huettig, 2005; Lieberman, 2005). Using the example of diving into a pool, the student must bring both arms over his or her head, bend his or her knees, and lean forward head first. The instructor explains the skill, provides physical guidance by positioning the student's body in the correct position with the arms over the head, and physically moves the body with the knees bent and the body leaning forward in the correct position for the dive.

When physical guidance is used, the instructor helps direct the student's body into the proper position required to perform the skill accurately and helps him or her feel the movement of the skill (Lieberman & Cowart, 1996). For example, when teaching a student how to strike an object from a batting tee with a bat, an instructor may move the student's arms into a position with the elbows up and the bat behind the head. When teaching the flutter kick for the front crawl stroke in swimming, the instructor could physically guide the student's legs into the proper form, thus increasing the student's understanding of the motion and improving the student's performance. Physical guidance has been shown to increase the success of students who are visually impaired in acquiring skills (Brueske & Cuvo, 1985; Erwin, 1996; Lane, 1996; O'Connell, 2000).

WHEN TO USE PHYSICAL GUIDANCE

The decision of when to use physical guidance is a difficult one in some cases. Many professionals suggest that students who are blind should be taught through tactile cues alone (Seaman, DePauw, Morton, & Omoto, 2003). Examples of tactile cues are a tap on the knee to remind a student to step with the opposite leg when throwing or a pull on the hand to teach the student to extend his or her arm, as in the front crawl stroke. The question arises as to when the instructor should stop relying on visual cues and explanation and start to use tactile cues for students with low vision. Should the decision be based on the student's level of performance, level of vision, or the student's need? Our belief is that it is all three. If a student does not have enough vision to rely on demonstration and cannot execute the skill successfully after receiving only explanation, a tactile cue should be used to ensure success. It is important for the instructor first to ask the student if he or she can use a tactile cue and then to notify the student when he or she will be touched.

Instructors often accept less-than-optimal performance from a student who is blind, perhaps because they do not choose to use tactile instruction or believe that a low level of performance is acceptable because the student has a disability. In either case, the student performs the skill below his or her potential. To have a student perform a skill repeatedly with only verbal instruction and feedback may result in frustration for both the student and the instructor and feelings of poor self-efficacy for the student.

Benefits of physical guidance

When a student is learning a skill, the proprioceptive feedback from the tactile prompt will give him or her the information needed to perform the skill correctly. In many cases, without the proprioceptive information, words are not enough to give the student a clear indication of performance expectations. Physical guidance gives the student the kinesthetic cue regarding the desired movement, increases his or her understanding of it, and allows the student to be aware of the correct form. Although the instructor may begin instruction with a heavy reliance upon physical guidance, the goal is to reduce the number of prompts in favor of natural cues, such as verbal cues, tactile taps, or timing sequences (as in dancing or aerobics) that will benefit the student in any situation.

Issues with the technique of physical guidance

Anytime an instructor touches a student, the touch can be misunderstood or misinterpreted. It is important that the instructor document, in progress reports, the student's individualized education program (IEP), and lesson plans, and the times at which the student benefits from the use of physical guidance so there is clarity about the intention of the physical touch that is used. Another factor to be aware of is that some students may be hypersensitive to touch. Students who have tactile sensitivity have an aversion to physical touch and will back away or wince when touched (Williamson & Anzalone, 2001). For these students, tactile modeling may be a preferred mode of instruction.

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, 1996). Tactile modeling gives the student who is totally blind the opportunity to feel and explore the model's body in the direction of a given movement. Like other tactile adaptations, the use of tactile modeling requires careful planning by the instructor and extra time is needed for students to benefit from this instructional strategy (Downing & Chen, 2003). Two examples of tactile modeling are when a student feels a the instructor's hips rotate in a batting swing to comprehend the idea of "hip rotation" and when he or she feels the instructor's body alignment to comprehend the positioning of the defensive stance in goalball. Speed, rhythm (Lieberman & Cowart, 1996), movement, direction, and precision can all be recognized and understood via tactile modeling (Downing & Chen, 2003). If the instructor is much larger than the student, the use of a peer who is the student's size may be beneficial.

WHEN TO USE TACTILE MODELING

Tactile modeling should be used with instruction and physical guidance when a student is first learning a skill or is trying to improve his or her performance. When verbal instruction alone is not effective, the instructor may try physical guidance or tactile modeling or both. As was mentioned in the introduction, one technique is not preferred over another. In many cases, when a student does not understand the components of a skill with explanation and physical guidance, he or she may understand them more clearly when feeling another student or the instructor perform the skill.

When a student is easily frustrated or time is limited, the instructor may want to start with tactile modeling. Tactile modeling may also be the first method used when the skill is complicated or completely novel, such as the hand position in shot put or the leg movement in the breast stroke.

Benefits of tactile modeling

Tactile modeling is beneficial in that it often clarifies the mechanics of the movement more comprehensively than does explanation alone or explanation and physical guidance. In addition, 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.

Issues with the technique of tactile modeling

Since tactile modeling involves a student who is blind physically touching the instructor or a peer, one issue that may arise is that the student must use the personal space of the instructor or peer. Since some peers may be uncomfortable being touched, this technique must be discussed before it is used. Students who are blind need to understand clearly that in the same way as they are told when the use of physical guidance will occur, they must notify the peer or instructor when they will be touching him or her and what they are looking for or trying to learn.

Again, as with the use of physical guidance, anytime a student touches a peer or instructor, the touch may be misunderstood or misinterpreted. Thus, when a student benefits from the use of tactile modeling, it is important for the instructor to document these instances in progress reports, the student's IEP, and lesson plans, so the intention of the physical touch that is used is clear.

Conclusion

Physical guidance and tactile modeling, coupled with explanation, are effective methods of improving the motor skills and physical activities of students who are blind (O'Connell, 2000). It is important that students with 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, 2005). It is imperative that the issues of personal space, fear of liability, and lack of one-to-one instruction are anticipated and overcome by instructors to ensure that students who are blind have the opportunity to clearly understand and learn the new skill. It is only when instructions are clear and high expectations of the performance of skills are clarified that students who are blind will improve their performance and increase their physical activity.

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