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Perceived Barriers to Including Students With Visual Impairments in General Physical Education

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The purpose of this study was to examine barriers perceived by teachers when including students with visual impairments in general physical education. Teachers (52 males, 96 females) who had children with visual impairments in their physical education classes were surveyed prior to in-service workshop participation. The most prevalent barriers were professional preparation, equipment, programming, and time. A logistic regression analysis, regressing gender, in-service training, number of students with visual impairments taught, masters degree attained, masters hours spent on visual impairments (yes or no), undergraduate hours spent on visual impairments (yes or no), and years of experience failed to indicate significant predictors of professional preparation as a barrier, Model $\chi^2(6, n = 148) = 4.48, p > .05$.

Education for children with visual impairments, including blindness, in physical activity contexts can be problematic from two standpoints. First, children with visual impairments have unique motor needs due to limited sight and a resulting lack of suitable movement experiences (Jan, Sykanda, & Groenveld, 1990; Pereira, 1990). Second, barriers perceived and/or actual may inhibit successful physical education instruction. Successful physical activity experiences for children with disabilities (particularly as children move from basic movements to more dynamic sport and recreation activities) are contingent upon factors related to teacher preparation, teacher attitudes, and perceived and actual barriers to instruction (Folsom-Meek, Nearing, Groteluschen, & Krampf, 1999; Hodge & Jansma, 1999; Sherrill, 1998).

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Visual impairments and blindness are low incidence disabilities. In this study the term, *visual impairments including blindness*, which is used in the implementation of the Individuals with Disabilities Education Act Amendments of 1997 (PL 105-17), guides our terminology. We thus refer to visual impairments as encompassing the full range of visual abilities and disabilities between legal blindness (20/200) and total blindness. Some sources (e.g., the United States Association for Blind Athletes) use the opposite approach, defining blindness as encompassing all forms of visual impairment. Among children under the age of 18, visual impairments occur in approximately 12.2 children per 1,000. The incidence of visual impairments in children occurs at a rate of .06 per 1,000 (National Information Center for Children and Youth with Disabilities, 1997). As a result, research has been limited on this population.

Legislative mandates such as PL 105-17, IDEA Amendments (Individuals With Disabilities Education Act, 1997) require that children with disabilities, such as visual impairments, are to be provided physical education, adapted if necessary to meet their unique needs. Individuals who teach general physical education (GPE) may lack the necessary knowledge and/or skills needed to accommodate these youngsters. Only one adapted physical education teacher is employed for every 745 children with disabilities (U.S. Department of Education, 1998). This number suggests that many students with disabilities are not receiving appropriate physical education (Ellery & Stewart, 2000). GPE teachers with very little or no previous training are being asked more and more to provide direct service to students with disabilities (Heikinaro-Johansson, Sherrill, French, & Huukha, 1995; LaMaster, Gall, Kinchin, & Siedentop, 1998; Murata & Little, 1995). These teachers may either be prepared inadequately or uninterested in teaching students with disabilities (Block & Rizzo, 1995).

For example, Heikinaro-Johansson et al. (1995) presented a case study of an elementary classroom teacher asked to include two 10-year-old girls with total blindness in a GPE class with 29 students and the help of two paraprofessionals over a 5-week period. An adapted physical education consultant, staying several days at the site, conducted a thorough needs assessment before the program began. Based on the findings of this assessment, she provided detailed lesson plans for the classroom teacher, who had no experience teaching children with disabilities and who expressed considerable concern about the inclusion goal. Because the distance between the consultant's office and the school required a 3.5 hr drive, the APE consultant visited the school only twice after the program began. Case study findings revealed that the amount of help that the consultant was able to provide was not sufficient; the classroom teacher continued to feel incompetent and insecure, stating "our gym is too small, and there are too many kids" (Heikinaro-Johansson et al., 1995, p. 27). However, at the end of the 5 weeks, she agreed to continue with inclusion, on condition that the consultant would continue to provide lesson plans.

No comparable research has described the effects of one or more in-service workshops or other supports on teacher and student variables related to including children with visual impairments in GPE. Textbooks, research, and related literature, however, agree that teachers should have basic knowledge of visual impairment when expected to adapt instruction. Following is a brief review of research-based knowledge.

The effects of visual impairments on development are many. Children with visual impairments typically demonstrate delays in reaching developmental milestones (Sherrill, 1998). These delays are due primarily to lack of visual input (Wyatt & Ng, 1997), visual stimulus, and social and environmental cues. Children with visual impairments do not have the same opportunities as sighted children to observe and imitate behaviors (Parsons, 1986). Therefore, they need more time, extra help, and more repetitions to learn what to do during play (Recchia, 1987; Sleeuwenhoek, Boter, & Vermeer, 1995). Children with visual impairments spend more time in isolated play than children who are sighted (Erwin, 1996; Schneekloth, 1989).

Children who are blind generally have fewer opportunities and incentives to engage in activities that provide the amounts and kinds of stimulation that are typical for sighted children (Gosch, Brambring, Gennett, & Rohlmann, 1997; O'Mara-Maida & McCune, 1996). These limitations result in delays in motor development (Jan, Sykanda, & Groenveld, 1990; Pereira, 1990) and motor skills, particularly locomotor activities (Pereira, 1990; Sleeuwenhoek et al., 1995). In addition, due to lack of early movement experiences and visual stimulation, children with visual impairment tend to develop inefficient motor patterns (Arnhold & McGrain, 1985; Lieberman, Butcher, & Moak, 2001; Nakamura, 1997). For example, biomechanical research on the running gait of children with visual impairment demonstrated that these youngsters ran with a backward lean (guarded posture), foot placement ahead of the body, shorter stride length, and decreased motion at the hip joint (Arnhold & McGrain, 1985; Nakamura, 1997). Inefficient gait leads to excess energy expenditure in activities of daily living and sport. Additionally, inefficient gait marks children with visual impairment as different and may hinder social acceptance.

In addition to motor pattern delays, children with visual impairments have consistently exhibited lower levels of fitness than their sighted peers (Blessing, McCrimmon, Stovall, & Williford, 1993; Lieberman & McHugh, 2001; Skaggs & Hopper, 1996; Winnick & Short, 1985). This is particularly noteworthy because children with visual impairments must work harder to accomplish daily living movement activities; therefore, the need to be fit is even greater than the norm (Buell, 1982).

Longmuir and Bar-Or (2000) reported that youths with visual impairment, along with those with cerebral palsy and muscular dystrophy, had the most sedentary lifestyles of the many disabilities studied. Moreover, 84% of the participants with visual impairments responded yes to this question: Are you limited in the type or amount of physical activity you can do? It appears that the 77 youth with visual impairments in this study had little awareness of the many sport activities in which individuals with disabilities can excel (Buell, 1982, 1986; Sherrill, Rainbolt, & Ervin, 1984). Buell (1986), who believed that youth with visual impairments should not feel limited, stated that "the greatest barrier to blind athletes competing against opponents who have normal vision is the widespread existence of misconceptions" (p. 217). Because of lack of knowledge, parents and teachers often overprotect children in physical activity contexts (Buell, 1986; Nixon, 1988; Sherrill et al., 1984).

Whether instructing children with visual impairments or any other disability, teachers continually confront barriers. Among these barriers are challenges relating to professional preparation, equipment, programming, time, communication, overprotectiveness, expectations, and apathy or poor attitudes. Only two studies

could be found that relate barriers directly to visual impairment (Heikinaro-Johansson et.al., 1995; Nixon, 1989). However, several studies discuss barriers in relation to disability in general.

LaMaster et al. (1998); Karge, McClure, and Patton (1995); and Mostert (1996) found that time management was a major conflict when trying to effectively teach children with severe disabilities. Krueger, DiRocco, and Felix (2000) found that budget restrictions led to a lack of adapted equipment in small and large school districts. Mostert (1996) found that many general physical educators did not provide an appropriate curriculum for children with disabilities and many did not even have a curriculum for their GPE classes. The amount of training a GPE teacher has received in adapting his or her curriculum and environment to meet the individual needs of their students also affects inclusion of students with disabilities (Blinde & McCallister, 1998)

LaMaster et al. (1998) studied the inclusion practices of effective elementary specialists. Although these teachers were chosen because they were some of the best in the district, they believed they were inadequately prepared to teach students with disabilities effectively in their classes. Similarly, Kelly and Gansneder (1998) examined professional preparation and job demographics of physical educators. Respondents expressed a greater need for training in teaching, motor development, and continuing education (i.e., professional preparation). Many general physical educators do not even know where to begin to ask questions about how to include children with disabilities (Chandler & Greene, 1995). Chandler and Greene found that although general and adapted physical educators received in-service training on including students with disabilities, 96% of these teachers reported that the training was not relevant to the field of physical education. Further, teachers may be resistant to including children with disabilities because of low tolerance, opposition, or fear of change (Margolis, Fish, & Wepner, 1990). Many professionals believe that knowledge of individuals with disabilities is not properly integrated into the curriculum of preservice teachers (Block, & Conatser, 1999; DePauw & Goc Karp, 1994). Similarly, Block (1999) states that it is assumed that most teachers possess the skills and behaviors necessary to teach heterogeneous populations if support personnel and curricula strategies are available. This has not yet been demonstrated.

Many experts agree that attitudes, teacher apathy, and low expectations are other major barriers to teaching students with disabilities in physical education. Attitudes of physical educators are more likely to be favorable for teachers with higher perceived teaching competence (Rizzo & Vispoel, 1991), more academic preparation (Rizzo, 1985), and practicum experience in teaching students with disabilities (Folsom-Meek et al., 1999; Rizzo & Vispoel, 1991). Rizzo and Kirkendall (1995), who studied the attitudes of future physical educators, reported that the best predictor of positive attitudes toward inclusion was perceived competence and adequate academic preparation. Similarly, Hodge (1998) found that an introductory course in adapted physical education created more positive attitudes in prospective GPE teachers than in their counterparts who had not taken such a course.

Although research focuses on children with disabilities in general, similar findings have been documented specifically regarding children with visual impairments. Barriers that particularly affect integration of children with visual impairments into physical education are opportunity to participate, attitudes of educators, and teacher's knowledge of individuals with visual impairments (Skaggs

& Hopper, 1996). Studies conducted regarding classroom teachers revealed major barriers were modifications to technology (Chamalian, 2000); teaching style, assignments, and testing strategies (Byrne, 2000); and problem-solving skills and attitudes (Sall & Mar, 1999).

The purpose of our study was to examine barriers perceived by teachers when including students with visual impairments into general physical education. It was hypothesized, based on the literature, that professional preparation (i.e., lack of knowledge) would be the most prevalent barrier. Four research questions guided the study:

1. What barriers do teachers of GPE perceive as most prevalent when including children with visual impairments?
2. What are the intercorrelations between selected demographic variables related to professional preparation and experience?
3. What demographic variables increased the likelihood that teachers perceived professional preparation as a barrier over a baseline value of 50% accuracy?
4. Was the dichotomous variable of hours devoted to visual impairment training (yes, no) related significantly to type of master's program (adapted physical education, special education, general education, other)?

Method

Participants

Participants (n = 148) were 52 males and 96 females currently teaching physical education. All participants were in attendance at one of six workshops. Five workshops were held in the state of New York, and one workshop was held in Minnesota. The workshops were sponsored by the Commission for the Blind in New York and the Minnesota Deaf-Blind Project and were offered to those teachers who chose to attend. Each of these teachers had taught a child or children with visual impairments. All teachers were physical educators and had at least a bachelor's degree in physical education. Teaching experience ranged from 1 to 34 years (M =14.1; SD = 9.39). Participants (n = 111) held master's degrees in physical education pedagogy, adapted physical education, and special education. The sampling design was intact groups.

Instrumentation

We developed a questionnaire to determine barriers that physical educators might perceive when including children with visual impairments in their GPE classes. Content validity was determined by extensive reviews by three adapted physical education specialists, two specialists in the field of visual impairments, and one expert on questionnaire research. The adapted physical education specialists were university professors with doctoral degrees (in adapted physical education) with a minimum of 6 years in research and teaching. The specialists were one international level athlete who was blind, a university professor in adapted physical education who specializes in questionnaire research, and one expert on visual impairment and adapted physical education. The expert in questionnaire research had conducted numerous studies using questionnaires and had published extensively

in adapted physical activity journals. The expert in visual impairment conducts a variety of programs for individuals with visual impairments and has conducted research and published in the field of visual impairment. The instrument was modified according to various comments given by experts. Test-retest reliability was determined by administering the questionnaire to students (n = 19) in a physical education master's degree program. Test-retest reliability statistics revealed 76% to 100% agreement between two administrations of the instrument using a 7-day retest interval.

The questionnaire consisted of queries relating to educational background, current teaching situation, and perceived barriers when including children with visual impairments into physical education classes. *Inclusion*, for these teachers, was defined specifically as teaching children with visual impairments in the GPE class with their sighted peers. Ten barriers were listed, and participants were asked to check all that they believed applied to their situation. See Table 1 for the barriers included in the questionnaire.

Procedure

Participants filled out the questionnaire approximately 30 min prior to beginning participation in a workshop designed to provide training on including students with visual impairments. The teachers were asked to be as honest as possible about their professional preparation background, current teaching situation, and barriers faced. Overall, for the 5 workshops, 75% of the participants completed a questionnaire. Participants who were therapists, vision teachers, or with backgrounds other than physical education were not asked to complete the questionnaires.

Table 1 Barriers to Including Children with Visual Impairments into General Physical Education (n = 148)

Barrier	f	%
Professional preparation	95	66
Lack of equipment	92	63
Programming/Curriculum	83	57
Time in schedule	81	56
Communication	62	42
Qualified teacher/personnel	58	40
Pace of units	58	40
Teacher overprotectiveness	51	35
Limited expectations	46	32
Medical excuses	43	30
Parental overprotectiveness	43	30
Apathy of teacher	41	28

Data Analyses

Data were analyzed to determine the most frequent barriers and key demographic information. Pearson product moment correlations were then computed between variables. A binary logistic regression model was used to determine if demographic information and past training experiences improved the ability to predict (over a baseline of 50%), from which participants would select the most frequently identified barrier (Hair, Anderson, Tatham, & Black, 1995). Logistic regression was selected because of the nature of the barriers questionnaire. The likelihood that respondents select a barrier (or did not) is the research question of interest making binary logistic analysis appropriate. Further, given the nature of dependent variable and independent variables, it was necessary to find a statistical analysis that did not require meeting the assumption of normal distributions of residual statistics. In this regard, logistic regression was selected because of our desire to test whether or not an event occurred rather than predicting values of a dependent measure (Hair et al., 1995). The highest frequency barrier (lack of professional preparation) was regressed on the variables of gender, in-service training, number of children served with visual impairments, master's training in adapted physical education or special education, hours devoted from master's education to visual impairments, undergraduate hours devoted to visual impairments, and years experience, which were entered simultaneously.

Finally, an additional analysis was conducted, given the high percentage of physical educators from the sample who had master's training from programs other than those concentrating in adapted physical activity. A chi square test was used to determine if hours devoted to visual impairments (yes or no) was related to type of master's program (adapted physical education, special education, general education, or other).

Results

Table 1 presents the frequency and percentage associated with each barrier identified. The most prevalent barriers to including children with visual impairments were professional preparation at 66%, lack of equipment at 63%, programming or curriculum at 57%, and time in schedule at 56%. Communication, qualified teachers/personnel, pace of units, teacher overprotectiveness/fear, limited expectations, medical excuses, parent overprotectiveness, and teacher apathy each were selected by less than half of the participants.

Intercorrelations between variables entered into the binary logistic regression equation are found in Table 2, which reveals that correlation coefficients ranged from .00 to .44. All coefficients of .20 or greater were significant at the .05 level. For the most part, these relationships were low, indicating that predictor variables had little to no relationship between one another. The highest amount of variance explained by any correlation coefficient was 19% (i.e., $r^2 = .19$). This statistic is a measure of effect size.

Using logistic regression, it was found that the key demographic variables did not increase the likelihood that physical educators selected professional preparation over a baseline value of 50% accuracy (random identification selecting the barrier of not). Model statistics for this analysis include χ^2 (6, $n = 148$) = 4.84, $p >$ .05, Log likelihood = 188.25, $R^2 = .03$. Wald statistics from the logistic regression

equation for variables ranged from .01 to 2.29 (all p values > .05). Correlation matrix of parameter estimates for variables in the model ranged from .15 to -.44 for the seven variables indicating moderate negative correlations between some of the independent variables (Table 2). Specifically, whether or not respondents indicated that they completed a graduate program was moderately correlated (negatively) to master's hours devoted to visual impairments (yes or no). All other relationships resulted in low to no relationship between variables.

To assess how well the selected model fits these data, predictions of whether or not professional preparation was correctly identified is demonstrated by the percent of correctly predicted classifications found in Table 3. In this, 5 cases were correctly classified as not identifying professional preparation and 90 were correctly identified as having identified professional preparation. The remaining 53 cases represent incorrect classifications using the seven predictor variables. In comparison to the baseline for prediction (50% using a random method of prediction), the 64% correct is only slightly higher when using the logistic regression model (Table 3).

Finally, analysis concerning the type of graduate concentration (i.e., adapted physical education, general physical education, or special education) revealed association between content area and whether or not any instruction in visual impairments occurred, $\chi^2(3, n = 148) = 31.02$, $p < .001$. Results indicated that only 3 % of those who had not completed their master's degree and 22% of those who completed a general physical education master's programs indicated that they had received master's hours devoted to instructing children with visual impairments. Further, 50% of physical educators in special education master's programs and 59% of physical educators in adapted master's concentrations responded positively to having hours devoted to instructing children with visual impairments.

Table 2 Intercorrelations Between Demographic Variables for 148 General Physical Educators

Variables	Intercorrelations								
	1	2	3	4	5	6	7	*M*	*SD*
1. Gender	—	–.07	–.04	.12	.06	–.15	.14	—	—
2. In–service training		—	–.13	–.07	.01	–.19	–.09	.40	.49
3. Number of children with VI			—	.03	–.01	.02	.04	4.97	12.0
4. Masters APE				—	.06	.00	.44	1.2	1.0
5. Graduate hours VI					—	–.23	–.07	5.0	3.0
6. Undergraduate hours VI						—	–.06	.28	.45
7. Years of experience teaching							—	.50	.50

Note. Correlations represent Pearson correlations.

Table 3 Classification Table: Predicting Professional Preparation as a Barrier (Power of Equation)

	Predicted		
Observed	Did not identify	Did identify	% Correct
Did not identify	5[a]	48	9.4
Did identify	5	90[a]	94.7
Overall % correct			64.2

[a]The logistic regression equation was correct in predicting whether or not professional preparation was identified as a barrier in 64% of 148 the cases.

Overall, 72% of individuals teaching children with visual impairments had no master's hours specific to children with visual impairments. Further, findings indicated that 50% of the teachers in special education and 41% of the teachers in adapted master's programs received no information on teaching children with visual impairments.

Discussion

The purpose of this study was to examine barriers perceived by teachers when including students with visual impairments in general physical education. Professional preparation, appropriate equipment, programming or curriculum, and time in schedule were the dominant barriers reported by 148 physical educators.

Lack of professional preparation was identified as the most prevalent barrier by the sample. We therefore accepted the hypothesis that guided the study. Because all physical educators must go through a professional preparation program in order to teach physical education, experts who plan undergraduate curriculums need to take this information into consideration and plan courses of study to meet these obvious needs. Many teachers in this study did not believe that they knew what to do with children with disabilities and, in this case specifically, children with visual impairments. The literature also concludes that with improved training and experience, teacher confidence and attitudes also improve (Heikinaro-Johansson, 1995; Rizzo & Vispoel, 1991).

Lack of appropriate equipment appears as the second most prevalent barrier in teaching children with visual impairments. Some types of equipment necessary to teach children with visual impairments in physical education include auditory balls, bright balls, bright cones, tactile guidewires, and tactile boundaries. It is likely that this information would be taught in an adapted physical education class because it is covered in most adapted physical education textbooks (Auxter, Pyfer, & Huettig, 2001; Dunn, 1997; Sherrill, 1998; Winnick, 2000) and web sites such as Project INSPIRE (www.twu.edu/INSPIRE) and the National Center of Physical Activity and Disability web site (www.ncpad.org). Individuals who experience

inadequate professional preparation programs may not have access to this important information.

The third major barrier, lack of adequate programming, is often cited in relation to inclusion (Block, 1999; Block & Vogler, 1994; DePauw & Goc Karp, 1994; Mostert, 1996). This is not surprising, because children with visual impairments need a curriculum that embeds some team and small group sport instruction with an array of individual and lifetime activities (Lieberman & Cowart, 1996; Lieberman & Houston-Wilson, 1999; Sherrill, 1998). A child who is visually impaired will typically have more success in activities such as swimming, weight lifting, fitness, archery, or track and field as opposed to football, volleyball, or basketball. Teachers who have had adequate training can create a curriculum with a balance in order for children with visual impairments to be successfully included.

Time in schedule was also a frequently mentioned barrier to successfully including children with visual impairments in physical education. Time is consistently mentioned in the literature (Karge et al., 1995; LaMaster et al., 1998; Mostert, 1996) as a factor that impedes successful inclusion. Time in schedule could help to facilitate inclusion by providing for more individualized instruction in an environment with a lower teacher-to-student ratio. More time would also allow teachers to prepare peer tutors and teachers (Lieberman & Houston-Wilson, 2002).

The other barriers of communication, qualified teachers/personnel, pace of units, teacher overprotectiveness/fear, limited expectations, medical excuses, parental overprotectiveness, and teacher apathy were chosen by less than half the participants. It is speculated that these barriers were not chosen as much because these teachers were proactive. They volunteered to attend a workshop to gain information. Willingness to attend workshop is potentially linked to other types of resourcefulness that perhaps makes such barriers as medical excuses, communication, or the pace of the units less prevalent to including children with visual impairments in general physical education classes. However, determining why these barriers were less prevalent and lack of professional preparation was a much larger barrier requires further study.

The binary logistic regression equation failed to yield significant predictors of whether or not professional preparation was a perceived barrier. This is somewhat disturbing because training variables made up the majority of predictors entered. In-service training, master's concentration, undergraduate experiences, and years of experience did not increase predictive power of the equation. In general, these findings indicate that the training received by these 148 physical educators did not impact on perceptions that professional preparation was a barrier to instruction. These results contradict studies that state the more years experience, the more confident teachers feel (Rizzo & Vispoel, 1991). Interestingly, contact theory (Allport, 1954) states that attitudes can be changed for the better if contact is positive, ongoing, and working toward a common goal. If teachers felt inadequate and saw the experience as negative and not working toward a common goal, the results would appear to be negative attitudes. Tripp and Sherrill (1991) state that positive attitudes depend on the conditions under which contact occurs, and this points to negative attitudes if the conditions were negative due to lack of adequate preparation.

When determining if professional preparation was a barrier, the statistics revealed no significant correlation. If we train people adequately, they should not perceive professional preparation as a barrier. However, if we know people see inadequate professional preparation as barrier after they have graduated from their

programs, then we must do more in-service training. Analysis of the data on in-service training revealed that 66 out of 88 teachers indicated they were given in-service opportunities, yet believed it did not help. This may mean that in-service strategies are ineffective. It supports the fact that in-service workshops often do not target either the disability or physical activity. In both the correlation matrix and the prediction equation, it was determined that educational background, years of experience, and gender did not meaningfully relate to the perceived barrier of professional preparation.

The findings indicated that no matter what the educational background, the barrier of professional preparation was still prevalent. Possible reasons are that professional preparation programs provide minimal information on how to teach children with visual impairments in inclusive physical education settings. This may be true for both vision programs and physical education programs. When questioning physical educators, anecdotal information revealed that much of that time was spent on the physiology of the eye and the various causes of blindness or visual impairments. While this is valuable information, more time needs to be spent on teaching strategies and curricular adaptations. This should include information on appropriate equipment, where to order it, and how to use it.

Recommendations for Future Research

1. Replicate this study with other samples and explore theories (e.g. reasoned action, planned behavior, contact) that might help to explain findings.
2. Send out a questionnaire to professional preparation graduate and undergraduate programs to determine what they do in terms of teaching students how to teach children who are blind or visually impaired.
3. Determine the most useful method(s) of educating professional preparation students to teach children who are blind or visually impaired (i.e., practicum, simulations, videos, etc.).
4. Determine the most useful method(s) of educating current teachers how to teach children who are blind or visually impaired (i.e., in-services, practicums, workshops, web sites, books, etc.)
5. Interview administrators and determine what method(s) they would promote and be most willing to offer their current teachers.

Research in the field of visual impairments and physical activity needs to continue to occur. Best practices need to be identified; collaboration with orientation and mobility experts need to be studied; and children with visual impairments need to be interviewed to determine their perceptions of physical education regarding instruction, curriculum, equipment, interaction with peers, and teacher attitudes. This new research-based knowledge then needs to be woven into teacher preparation, both preservice and in-service.

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