

Tjaša Filipčič^{1*}**Maja Burian¹****Bojan Leskošek²****TEACHERS' BELIEFS REGARDING TEACHING STUDENTS WITH VISUAL IMPAIRMENTS IN PHYSICAL EDUCATION****PREPRIČANJA UČITELJEV O POUČEVANJU UČENCEV S SLEPOTO IN SLABOVIDNOSTJO PRI ŠPORTNI VZGOJI****ABSTRACT**

The purpose of a present study was to investigate the professional beliefs of Slovenian physical education teachers regarding the teaching of students with visual impairments in physical education. A self-administered questionnaire was designed to examine teachers' beliefs. Participants, 131 Slovenian PE teachers, rated their professional beliefs on a five-point Likert scale. A factor analysis was conducted to examine the internal structure of the belief field. The results show that self-perceptions of their beliefs were complex and consisted of 7 factors, which together explained 33.7% of the cumulative variance. Teachers strongly believe that vocal information, colourful sports equipment, and tactical guides enable students with visual impairment to participate in physical education. Adapted methods, safety measures, and learning support assistants are also important, as is a positive attitude toward inclusion. The findings of the present study need to be incorporated into the future updating of PE teacher training programmes for teaching students with visual impairments.

Keywords: teaching, special education, professional beliefs

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IZVLEČEK

V pričujoči raziskavi smo raziskovali prepričanja učiteljev predmeta Šport o poučevanju učencev s slepoto in slabovidnostjo pri predmetu šport. V ta namen smo skonstruirali vprašalnik. V raziskavo je bilo vključenih 131 slovenskih učiteljev predmeta Šport, ki je izbiralo odgovore na 5 stopenjski Linkartovi lestvici. Izdelana je bila faktorska analiza za preverjanje notranje strukture znotraj področja prepričanj učiteljev o poučevanju. Rezultati nakazujejo kompleksno strukturo, ki je vsebovala 7 faktorjev in pojasnjevala 33.7% kumulativne variance. Učitelji so prepričani, da je za vključevanje učencev s slepoto in slabovidnostjo v predmet Šport pomemben zvok, barvni športni pripomočki in taktilne oznake, kot tudi prilagojene metode učenja, varnost in asistenca asistenta. Učitelji so tudi prepričani, da je poučevanje učencev s slepoto in slabovidnostjo pri predmetu šport izziv in ne problem. Ugotovitve raziskave je potrebno vključiti v nove programe usposabljanj in izpopolnjevanj učiteljev, ki vključujejo učence s slepoto in slabovidnostjo v predmet Šport.

Ključne besede: poučevanje, specialna pedagogika, profesionalni razvoj

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INTRODUCTION

A large body of research suggests that teachers' beliefs and values about teaching and learning influence their instructional practices (Pajares, 1992; Korthagen, 2004; Lieberman et al., 2002). Pajares (1992) also stated that teachers' professional development and beliefs are an important principle for teaching. A teacher forms his or her beliefs about teaching and changes them directly through learning and practical experiences. Therefore, influencing teachers' beliefs can be instrumental in changing teachers' teaching practice. Several studies have been published on teachers' beliefs in different academic fields (e.g., in mathematics, Stipek et al., 2001; Kovač et al. 2008 in PE). Stipek et al. (2001) presented beliefs about teaching and learning mathematics and the relationship between their beliefs and practices. The aim was to develop professional development approaches to promote inquiry-based mathematics teaching in the classroom. Kovač et al. (2008) investigated actual and desired professional competencies with the aim of diagnosing the most important needs of practicing PE teachers and resolving them within a revised Slovenian Physical Education Curriculum and through ongoing professional development programs. The findings indicate that physical education teachers are realistic about their own deficiencies in certain areas of practice. One of the deficits identified in this study was working with students with special educational needs (SEN).

The inclusion of students with SEN in general/mainstream education is becoming more common worldwide (DePauw & Doll-Tepper, 2000; Kudlaček et al., 2007). In parallel with this trend, therefore, courses of study need to address issues related to the teaching of students with SEN in physical education (PE). For example, attitudes and how they are prepared for teaching students with various SEN are well-studied variables (Folsom-Meek et al., 1999; Hodge et al., 2002, 2003). In recent years, the beliefs and behaviours of teachers who teach students with SEN have been explored. For example, Hodge et al. (2004) examined the behaviours and beliefs of experienced high school teachers regarding inclusion and teaching students with SEN. They reported that these teachers frequently interacted verbally with students with SEN and expressed predominantly positive beliefs about teaching such students. They also described three recurring themes: teachers were positive about inclusion as an educational philosophy, had varying degrees of success in achieving inclusion, and encountered challenges in implementing inclusive practices. Of concern was that most teachers felt they were not adequately prepared and did not have the necessary supports and resources to effectively teach students with SEN.

Students with visual impairments (VI) are a rather small but not insignificant group among students with SEN. It is important that they attend PE to acquire new knowledge and gain physical, social and psychological advantages. In recent years, research in this area of inquiry focusing on the perspectives of individuals with VI has grown (DeSchipper, Lieberman, & Moody, 2016; Haegele, Sato, Zhu, & Avery, 2017; Haegele & Zhu, 2017). These studies have demonstrated the importance of the role of the PE teacher in modification and adaptation of physical activity. Tanure Alves et al. (2018) wrote PE teacher need to change pedagogical practices and beliefs toward students with VI because they play also an important role as promoters of physical activity. Instruction includes direct and indirect support. Instruction must be adapted to individual abilities and skills (O'Connell et al., 2006). Therefore, it is necessary for PE teachers to specifically acquire new skills. All this is part of the teacher's professional development, which we define as the process of important and lifelong empirical learning. This develops his concepts and changes his teaching practice and professional development. Sato et al. (2007) investigated PE teachers' beliefs regarding teaching students with SEN in integrated classes. The following themes emerged from the data: satisfaction, ambivalence, and concerns; inadequate professional preparation and communication; collaboration. Lieberman et al. (2002) studied 149 PE teachers and wrote that teaching children with VI requires appropriate equipment such as auditory balls, bright balls, bright cones, tactile guide wires, and tactile boundaries.

Learning support assistance can help PE teachers and improve the standards of inclusion for VI students (Herold & Dandolo, 2009). They confirmed that hands-on experiences are important because beliefs are changed by consciously and systematically framing the meaning of experiences or new knowledge (Korthagen, 2004). Sato et al. (2007) added that it is important to examine teachers' beliefs because they serve as antecedents for their behaviour.

From the literature review on beliefs related to teaching students with VI, researchers mainly focused on beliefs regardless inclusion and deficits in teaching students with VI. Nothing was written about the importance of teaching methods. Also, little was written about safety measures during PE. Therefore, to examine beliefs the aim of the present study was to create a self-administered questionnaire to identify the beliefs expressed by PE teachers when teaching students with VI.

METHODS

Study protocol

Prior the study, the head teachers of the different primary schools in Slovenia were informed about the study. Later, the questionnaire was sent to 185 PE teachers working in primary schools. 131 PE teachers decided to participate in the study. PE teachers were informed about the aims of the study and about the voluntary and anonymous nature of their participation. The study was conducted in accordance with Declaration of Helsinki and all procedures were approved by Faculty Ethics Committee.

Following previous studies (Lieberman et al., 2002; Korthagen, 2004), we developed a self-administered questionnaire to identify the beliefs expressed by PE teachers when teaching students with VI (TB_PEVI; Teachers' Beliefs_Physical Education Visual Impairments). The validity of the questionnaire was established through extensive reviews by three experts (university lecturer with 20 years of teaching and research experience in the field APA; athlete with VI and expert in the field of special education; an expert in the field of visual impairment and adapted PE). The questionnaire consisted of two parts:

- 1) demographic information about the teachers (gender, age, degree programme, length of professional experience, age, teacher triad).
- 2) Professional beliefs regarding teaching students with VI in PE classes (54 items), which were evaluated with teachers' beliefs regarding teaching students with visual impairments in physical education (TB_PEVI). The TB_PEVI contained statements about teaching students with VI in PE (e.g., "students with VI learn with tactile exploration, student needs more time, student needs more visual support"). Respondents indicated their current beliefs on a five-point Likert scale, with "1" representing "strongly disagree," "2" representing "disagree," "3" representing "undecided," "4" representing "agree," and "5" representing "strongly agree."

Participants

The sample consisted of 131 PE elementary school teachers from 1st to 9th grade (25 males, 19.1%; 106 females, 80.9%). The mean age of the participants was 43.6 years (SD =10.4). 93 teachers (64.9%) had graduated at the Faculty of Education and 38 (35.1%) at the Faculty of Physical Education. Almost half of the participants had been teaching for more than 20 years (n = 55, 42%). 10.7% (n = 14) had been teaching 5-10 years, while other distribution of "years of teaching" is as follows: 10-15 years (n = 19; 14.5%); 7-10 years (n = 8, 6.1%), 3-7 years (n

= 12, 9.2%), and 17.6% ($n = 23$) had been teaching for 1-3 years. Nearly two-thirds of participants ($n = 84$, 64.2%) were teaching in the first triad, while others in the second triad ($n = 22$, 16.8%) and third triad ($n=21$, 16%). The teachers came from different statistical regions of Slovenia, and in particular all regions were included. Most participants ($n = 93$, 71%) indicated that they received general competencies related to teaching students with VI as part of their university education. Most participants ($n = 106$, 80.9%) did not have any practical experiences teaching students with VI, while 19.1% ($n = 25$) had previously such teaching experience prior to the study.

Data analysis

Data were analysed using the computer programme PASW Statistics 18.0. First, the test Kaiser-Meyer-Olkin (KMO) was used to evaluate the adequacy of the sample of variables. Second, Bartlett's test for sphericity was used. Maximum likelihood factor analysis (ML) with oblique rotation (Direct oblimin) was used to reduce the complexity of the relationships between questionnaire items. Kaiser criterion ($\lambda > 1$), scree plot and interpretability of factors were considered in deciding the number of factors. The internal consistency coefficient Cronbach's alpha was used to calculate the reliability (internal consistency) of the questionnaire.

RESULTS

The entire questionnaire has a sufficient degree of reliability (Cronbach's alpha = .97), while the values of the individual questionnaire parts range from .77 to .90. The results of the Kaiser-Meyer-Olkin test (KMO = .636) and Bartlett's test ($p < .001$) confirm the suitability of the factor analysis. The procedure extracted 7 factors that together explained 33.7% of the cumulative variance (Table 1).

Table 1. Factor names, factor loadings (correlation of factor scores with item score), Cronbach's alpha coefficients of internal consistency and percent of total variance explained by factors.

Factor/ Item	Factor loading (a)	Cronbach's alpha	% v
1. Voice as important guidance		0.76	7.987
In elementary school games, other classmates call/clapping the student with VI to lead them in the gym.	0.716		
In the pool, the student with VI can be led by teacher's voice.	0.655		
The teacher leads a student with VI by voice (clapping, devices that provide voice).	0.621		
2. Colour of the equipment and light		0.82	4.714
Coloured balls are suitable for catching and throwing the ball for students with VI.	0.898		
Coloured sports equipment (such as the top of the volleyball net, the basketball table, the frame of the goal) is appropriate for students with VI.	0.770		
Appropriate lighting helps students with VI, follow the ball when playing football.	0.516		
Fluorescent balls are important for the perception of their position.	0.419		
3. Adapted methods		0.62	4.526
A teacher teaches students with VI certain gymnastic exercises (position of the body, hands, legs) through tactile modelling.	0.622		
A teacher teaches student with VI certain technical elements (crawl, breaststroke) through physical guidance.	0.535		
The student with VI may act as a leader or demonstrator of a particular exercise or as a demonstrator of a tactic in a sports game.	0.475		
A teacher teaches a student with VI some tactical elements with the help of a tactile board.	0.427		
4. Exclusion in particular activity due to danger of injury/safety measures		0.65	4.318
Students with VI do not take different jumps because of the risk of injury.	0.745		
Students with VI do not participate in running games because of the risk of injury.	0.569		
Students with VI do not participate in the preparation and clean-up of a sport equipment.	0.478		
Students with VI cannot perform some gymnastic elements involving dismounting (somersault, jumping rope, handstand on shoulder blades).	0.467		
5. Beliefs towards inclusion		0.64	4.215
Teaching students with VI is a challenge and not a problem for a teacher.	0.828		
Teaching students with VI is a positive experience and not a problem for a teacher.	0.627		
Teachers would like to teach students with VI but lack information.	0.463		
6. Learning support assistance		0.72	4.09
Students with VI have support in running, so he/she puts hand on assistant's shoulder.	0.896		
Students with VI have support while running, so he/she holds the assistant's hand.	0.548		
7. Tactile guidewires and tactile boundaries		0.66	3.914
Tactile guidewires (rough conveyor belts, fluorescent arrows) help students with VI independent physical activity.	0.738		
Tactile guidewires and tactile boundaries allow safe movement of a student with VI.	0.449		

DISCUSSION

The main finding of the study is that 7 extracted factors (Table 1) show a rather complex profile of teachers' beliefs about teaching PE students with VI.

Voice as important guidance

Participants in our study expressed beliefs about teaching using voice, which is confirmed by the first factor that explains 7.9% of the variance of the whole system and has the highest correlation with 4 factors (Table 1). Motor skills can be learned and executed through the transmission of verbal information and instructions (O'Connell et al., 2006). The teachers in our study believe voice is important to guide student with VI in the gym and also in other areas, such as swimming pool. The importance of voice was also confirmed by Lieberman et al. (2002). Teachers believe that it is important to find an appropriate sensory pathway to obtain information. Indeed, students with VI cannot learn through visual observation, so circumstances (where voice is an important element) must be created.

Colour of the equipment and light

The second factor explains 4.7% of the variance of the whole system and has the highest correlation with 4 factors determining the belief in the importance of equipment colour and light. Lieberman et al. (2002) write that some types of equipment must be adapted, such as bright balls, bright cones that contrast with the space (e.g. fluorescent ball that allows faster perception when catching or hitting the ball). We also need to provide adequate/appropriate lighting in the gym. Inappropriate light with sparkles, strong contrasts, shadows, sun rays are obstacles for participants with VI, to use the remaining vision.

Adapted methods

The third factor explains 4.5% of the variance of the whole system and has the highest correlation with 4 factors that determine the belief about the importance of adapted methods when it comes to students with VI. Teachers believe that the student can obtain information through specific teaching and learning methods such as tactile modelling and physical guidance. Tactile modelling is a process in which students try to mimic the actions that another person performs; it promotes understanding of what the individual needs to do. Physical guidance involves performing a specific movement with an individual to learn rhythm and movement instructed by the teacher (O'Connell et al., 2006). Once a skill is understood, students with VI have mental information of what to do. Teachers also believe that a student with VI can lead

certain drills or games and not just passively participate. Finally, a tactile board can be used at PE to convey information to the student.

Exclusion in particular activity due to danger of injury/safety measures

The fourth factor explains 4.3% of the variance of the whole system and has the highest correlation with 4 factors. These factors determine the belief that students with VI are sometimes excluded from PE because of safety measures. Participants believe that various jumps, gymnastic elements, and running games can be dangerous. They also believe that students do not need to prepare and clean up the sports equipment. Of course, safety comes first, but the teacher's overprotection (overprotectiveness, fear) prevents students with VI from gaining new movement experiences and knowledge. Therefore, the golden rule is to create conditions where individuals can do as much as they can on their own. We have to help where and when student with VI cannot perform and move or where it is too dangerous for him. Sports equipment can be prepared and cleared along with other peers. This is also a message to students with VI they are important and useful.

Positive beliefs towards inclusion

The fifth factor explains 4.2% of the variance of the whole system and has the highest correlation with 3 factors that determine the positive attitude of teachers towards the inclusion of students with VI in PE. They see teaching as a challenge and positive experience rather than a problem. The beliefs related to inclusion were the most studied beliefs in the research and most of them came up with positive results. Conroy (2011), Herold in Dandolo, (2009), Lieberman et al. (2002) reported similar findings to our study. Classmates and teachers have positive experiences with inclusion in PE. Classmates also learn positive interactions and acquire new social skills when students with VI were included PE.

Learning support assistance

The sixth factor explains 4.2% of the variance of the entire system and has the highest correlation with 2 factors determine learning support assistance when needed. This support may be offered so the student with VI places his hand on the assistant's shoulder, or the student with VI holds the assistant's hand while walking/running, or during gymnastics. It can be also given when the student does not fully understand the teacher's verbal instruction. The learning support assistant explains the instructions again. The role of the learning support assistant can contribute

instructionally to the student's learning process/experience and also provide emotional support, as noted in Herold & Dandolo's (2009) single case study.

Tactile guidewires and tactile boundaries

The seventh factor explains 3.9% of the variance of the whole system and has the highest correlation with 2 factors. These two factors determine belief of use of tactile guide wires and borders in PE. It is important to mark the edges of the gym and high obstacles with high contrast and coarse tactile markings. Tactile markings must also be placed on the walls to indicate the direction of movement. This has also been illustrated by Lieberman et al (2002).

A certain degree of caution is required when interpreting the results and determining the content of individual factor of belief in our study. This is mainly because the majority of the participants did not have any practical experience in relation to teaching pupils with VI, although 42 % of our sample had more than 20 years of teaching practices. It is likely that different results would be obtained if all participants had the same amount of practical experience. Also, the competencies regarding teaching PE can be an issue, since elementary school teachers (study at the Faculty of Education) received less information regarding teaching PE and more regarding teaching students with SEN, while teachers who studied at the Faculty of Sport received many information regarding teaching PE and little regarding teaching students with SEN and almost nothing regarding teaching students with VI.

CONCLUSION

The present study is a scientifically designed attempt to investigate the beliefs related to teaching students with VI in PE. A self-administered questionnaire was developed to identify the beliefs expressed by 131 PE teachers when teaching students with VI (TB_PEVI). Teachers were from different regions of Slovenia and had teaching experience prior to the study. Most participants had received some basic or no knowledge about teaching students with VI in PE during their studies and had no previous experience of teaching students with VI in their teaching careers. It was found that PE teachers believe that auditory information, adapted and coloured devices, assistance learning support, and tactile guide wires are important practical strategies to fully engage students with VI. Adapted methods using tactile modelling and physical guidance, previously discussed in O'Connell et al. (2006), were also important, as were safety measures. Participants viewed teaching students with VI as a challenge rather than a

major obstacle, which compares favourably to Tanure Alves et al. who in 2018 still found negative beliefs about teaching students with VI among Brazilian teachers. The positive beliefs of Slovenian teachers may be the result of 21 years of inclusion of students with SEN in the education system, where each teacher has gained some practical experience. The Low "Inclusion of students with SEN" was introduced in 2000. It is possible that these practical experiences in teaching students with other impairments were transferable to students with VI.

The findings of our study have practical implications. The highlighted themes can be implemented in PE curriculum modules regarding teaching students with VI, emphasising the importance of voice, colour and light, tactile guides, adapted methods, safety measures, and learning support assistance. Regarding the positive attitude towards inclusion, we strongly believe that we have made some progress in Slovenia and that we do not need to declare that students with SEN are included in mainstream school, but rather we should work on practical strategies for a higher quality of PE. To conclude this article, let us turn to a new idea of research in the field of beliefs about teaching students with VI in PE. The first idea is to investigate whether beliefs change after a study course/programme implemented for teachers, and secondly, we would like to investigate whether years of study play an important role in the development of teachers' beliefs.

Acknowledgment

We would like to thank participants, PE teachers participated in our study.

Declaration of Conflicting Interests

The authors have no conflicts of interest to declare.

Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

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