

PHYSICAL EDUCATION TEACHERS' SELF-EFFICACY TOWARD INCLUSION OF CHILDREN WITH AUTISM SPECTRUM DISORDERS: A LITHUANIAN PERSPECTIVE

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Abstract

We identified the self-efficacy of physical education (PE) teachers toward inclusion in PE classes of children with autism spectrum disorders (ASD), and determined the relationships between the teachers' self-efficacy, personal attributes, sources of self-efficacy, behavior, and perceived challenges. Participants were 404 PE teachers (162 men and 242 women) employed in Lithuanian general education schools, aged between 21 and 65 years. Results showed that the teachers' level of self-efficacy was moderate, and that greater self-efficacy of the PE teachers toward inclusion of children with ASD can be achieved through their attendance at courses and seminars in adapted PE, work experience with children with ASD, and support from adapted PE specialists, physical therapists, and psychologists. In addition, the self-efficacy sources of mastery experiences, vicarious experiences, and physiological states affected the PE teachers' self-efficacy toward inclusion of children with ASD, by having a strong positive impact on their behavior and perceived challenges.

Keywords: *teachers; physical education; self-efficacy; special educational needs; adapted physical education; autism*

Background

In Lithuania, 87.75% of children with special educational needs (SEN) are educated in regular education classes [15]. As the social interaction and communication of children with *autism spectrum disorders* (ASD) is impaired (see, 5th edition of the *Diagnostic and Statistical Manual of Mental Disorders*; [1]), the inclusion of these children in regular physical education (PE) classes can mean that PE teachers experience challenges [12]. In addition, Taliaferro, Hammond, and Wyant [17] have reported that, in regard to teachers' psychological characteristics such as their attitudes and self-efficacy, many PE teachers are not well trained for inclusion of children with SEN in regular PE classes.

Self-efficacy, an important construct in psychology and management [11], is the major concept of social cognitive theory [2], [3], and is increasingly used to support the development of teacher competencies in regard to inclusion [2], [20]. Bandura [3] defined *self-efficacy* as a person's confidence in his or her own capability to produce a desired level of performance, relying on the individual knowledge and skill he or she possesses as compared to the influence of a social reference group. The way that a PE teacher adapts the task, modifies the goal, applies educational methods, and handles difficult situations depends on his or her level of situation- and task-specific confidence [5]. In support of this finding, Ozyilmaz, Erdogan, and Karaeminogullari [13]

found that self-efficacy is highly related to human performance in the workplace.

According to Bandura [2], self-efficacy develops through four primary sources: mastery experiences, vicarious experiences, social persuasion, and physiological states. The most powerful source of self-efficacy for teachers who work with classes that include some children with SEN is *mastery experience*; for example, in regard, specifically to PE teachers, it has been found that those who strive to create an inclusive education environment for students with SEN usually have greater self-efficacy [16]. The second most significant source of self-efficacy is *vicarious experience*, for example, if a PE teacher watching a video of another PE teacher with a successfully accommodating the inclusion of a child with SEN, the self-efficacy of the teacher watching the video is positively influenced by the other teacher's behavior, and by the positive results for the child produced by the teacher's behavior [3]. *Social persuasion* improves PE teachers' self-efficacy toward inclusion of children with SEN by encouraging the teachers to support their ability to include children with SEN in their classes [5]. The source of *physiological states* indicates that PE teachers' emotional reactions can influence inclusion, for example, PE teachers can feel stress or be nervous because they are unable to include children with SEN in classes [3]. Taliaferro [16] found that PE teachers' self-efficacy toward inclusion of children with ASD is a strong predictor of self-reported inclusion behavior. Bandura [3] proposed that self-efficacy

is associated with the degree of challenge that exists in the context of a task. In the context of this proposal as it pertains to teaching children with SEN, PE teachers with low self-efficacy may view these children as a threat instead of a challenge to their professional performance [10]. Thus, as those with high self-efficacy feel that they have the ability to confront obstacles and succeed if given appropriate support, they should perceive fewer challenges compared with those with low self-efficacy.

Although Klassen and Tze [11] and Tschannen-Moran and McMaster [20] have suggested that teachers' self-efficacy is directly linked to their professional preparation, few researchers (e.g., Beamer & Yun [4], Taliaferro [16]) have explored the relationships between the self-efficacy, challenges, and behavior of PE teachers in regard to the inclusion of children with SEN (particularly those with ASD) in PE classes. As the situation and level of inclusion of children with SEN differs in different countries, especially in the environment of the PE class, we proposed the following research questions:

- (a) What is the difference between the level of self-efficacy of physical education teachers who have had children with autism spectrum disorders in their classes and those who have not?
- (b) Which knowledge affects physical education teachers' self-efficacy toward inclusion of children with autism spectrum disorders?
- (c) What challenges do physical education teachers face in their classes with children with autism spectrum disorders?
- (d) How do physical education teachers who have no children with autism spectrum disorders in their classes face the challenge of involving children with autism spectrum disorders?
- (e) How do the sources of self-efficacy [2] influence the self-efficacy of physical education teachers?
- (f) What are the links between physical education teachers' self-efficacy, behavior, and perceived challenges?

Finding answers to these questions can help identify the behavior of PE teachers toward children with ASD and guide future education and professional development programming for PE teachers.

In this study we aimed to evaluate PE teachers' self-efficacy when they are working, or planning to work, with children with ASD, and to identify their personal attributes and the sources of self-efficacy that influence their self-efficacy. We also examined the influence of self-efficacy on the

behavior of these PE teachers, and whether self-efficacy affects their perception of challenges in the inclusion of children with ASD in classes.

Method

Participants

Participants comprised 404 PE teachers employed in schools in 29 municipalities in Lithuania, of whom 40.1% were men and 69.9% were women, and whose ages ranged from 21 to 65 years ($M = 47.28$, $SD = 8.51$). Participants had PE teaching experience ranging from 1 to 45 years ($M = 22.09$, $SD = 9.79$), and they were all employed in secondary schools. Of the participants, 49.26% had children with a moderate ASD in their PE classes during the last 5 years and 50.74% had not any children with these disorders in their classes. Of the 199 participants who had children with ASD in their classes, 95 participants had the three types of experiences: mastery experience, vicarious experience, and social persuasion experience, 86 participants had experienced one or two types, and 18 had experienced none of the types when working with the children with ASD, because, although there were children with ASD in the classes they were not included in class activities. The research design for the implementation of the study was approved by the Committee of Ethics of Social Sciences at the Lithuanian Sports University. Participants signed an informed consent form prior to filling in the survey form.

Procedure

Teachers' recruitment was conducted between September and December 2016, using two modalities: (a) distributing a paper-based survey form to PE teachers immediately prior to a 6-hour seminar for PE teachers held in Vilnius, Lithuania on adapted physical education, or (b) distributing the survey to PE teachers at their schools. According to data from the year 2016 [15], at that time there were 1,645 PE teachers working in these municipalities. During the seminar for PE teachers in Vilnius, 55 survey forms were completed and 349 forms were completed when the surveys were taken direct to the PE teachers at the schools.

Prior to responding to the survey items, participants were given the description of a person with moderate ASD, which was modified to apply to a PE setting from the definition of ASD in the *Diagnostic and Statistical Manual of Mental Disorders* [1]. Participants' responses to the scale items were summed and the average was calculated.

Measures

We used the Lithuanian version of the Physical Educators' Self-Efficacy Toward Including Students with Disabilities-Autism Scale (PESEISD-A) [16]. The scale's author gave permission to Selickaitė, Hutzler, Pukėnas, Block, and Rėklaitienė [14] to validate and use this scale in their study conducted in Lithuania. Their results showed that the Lithuanian version (PESEISD-A-LT) is a valid and reliable instrument. It comprises the self-efficacy scale and six subscales: mastery experience, vicarious experience, social persuasion, behavior, physiological state, and perceived challenges.

Self-efficacy. We evaluated self-efficacy using the 10-item self-efficacy scale. Participants rated their degree of confidence in their ability to perform each of 10 tasks on a 10-point Likert scale, ranging from 0 (*cannot do at all*) through 5 (*moderately can do*) to 10 (*highly certain can do*). Sample items are "I am confident in my ability to modify equipment," "I am confident in my ability to modify activities," "I am confident in my ability to create a safe environment," "I am confident in my ability to promote social interactions with peers."

Mastery experience. We assessed mastery experience using the 10-item mastery experience subscale. Participants rated the level of experience they had experienced with the same 10 tasks on a 5-point Likert scale, ranging from 1 (*not at all successful*) to 5 (*very successful*); with an option of responding (*I do not have any experience of doing this*). A sample item is "How successful have you been at modifying equipment for students with autism spectrum disorders who are included in your general physical education classes?"

Vicarious experience. We assessed vicarious experience using the 10-item vicarious experience subscale. Participants rated the level of success of other PE teachers they had observed performing the same 10 tasks when including children with ASD on a 5-point Likert scale, ranging from 1 (*not at all successful*) to 5 (*very successful*). A sample item is "How successful are other PE teachers you have observed at modifying equipment for students with autism spectrum disorders who are included in general physical education classes?"

Social persuasion. We assessed social persuasion using the 10-item social persuasion subscale. Participants rated what others (teachers, parents, colleagues, supervisors, principals) had told them about their capabilities to include children with

ASD on a 5-point Likert scale, ranging from 1 (*not at all capable*) to 5 (*very capable*). A sample item is "What have others told you about your capabilities to modify equipment for students with autism who are included in your general physical education classes?"

Behavior. We assessed behavior using the 10-item behavior subscale. Participants rated how frequently they performed the same 10 tasks on a 5-point Likert scale, ranging from 1 (*never*) to 5 (*always*). A sample item is "How often do you modify equipment for students with autism who are included in your general physical education classes?"

Physiological state. We assessed physiological state using the two-item physiological state subscale. Participants rated how the inclusion of children with ASD made them feel on a 5-point Likert scale, ranging from 1 (*definitely false*) to 5 (*definitely true*). Responses were reverse-coded so that a higher score (a response of "*definitely false*") indicated a more favorable reaction. The items are "Including a student with an autism spectrum disorder in my general physical education class makes me feel stressed," "Including a student with an autism spectrum disorder in my general physical education class makes me feel nervous."

Perceived challenges. We assessed perceived challenges using the 11-item perceived challenges subscale. Participants rated the extent to which of each of 11 situations (see Table 4) they perceived as making it difficult to meaningfully include children with ASD on a 5-point Likert scale, ranging from 1 (*not at all an issue*) to 5 (*very much an issue*). A higher score indicated a perception of greater challenge.

Finally, participants answered demographic questions: age, gender, if they had attended adapted physical education and/or special education courses or seminars, had experience with including children with ASD in PE classes during the last 5 years, had support from specialists (specialist in adapted PE, teacher assistant, special education teacher, physical therapist, psychologist), and had personal experience with a friend or family member with ASD.

Data Analysis

Using the responses to the demographic items and instrument scales, we analyzed the participants' degree of self-efficacy on the basis of their experiences of including children with ASD in PE classes in regard to their mastery experience (ME), vicarious experience (VE), and social

persuasion (SP). We examined participants' self-efficacy on the basis of each of the types of experience separately; of having all three experiences, (ME, VE, and SP); having had two or one of the types of experience, (ME, VE, SP); or of having had none of these experiences (ME, VE, SP).

We used SPSS 22.0 and AMOS 23.0 to analyze the data. We calculated means, standard deviations, statistically significant frequency counts, Spearman's rank correlation, effect size of Hedges' *g* and Cohen's *f*², and conducted stepwise

multiple regression analysis and path analysis with a confirmatory analysis technique.

Results

Descriptive statistics and frequency counts (*n*) were used to characterize participants' demographic factors and other personal attributes. We used the effect size of Hedges' *g* to determine the mean difference between two groups as classified according to the responses to the demographic items (see Table 1). Participants' self-efficacy for the inclusion of children with ASD into PE classes was *M* = 5.30, *SD* = 2.14 (see Table 1).

Table 1. Self-Efficacy According to Demographic Factors, Personal Attributes, and Mastery, Vicarious, and Social Persuasion Experiences

Demographic factors/Personal attributes	<i>n</i>	%	Self-efficacy <i>M</i> (<i>SD</i>) * <i>p</i> < .05	Effect size Hedges' <i>g</i>
Gender				
<i>Men</i>	162	40.10	5.37 (2.04)	.05
<i>Women</i>	242	59.90	5.26 (2.21)	
Had undergraduate or graduate APE courses				.38*
<i>Yes</i>	86	21.29	5.93 (2.24)	
<i>No</i>	318	78.71	5.13 (2.09)	
Had SE undergraduate or graduate courses				.18
<i>Yes</i>	204	50.50	5.49 (2.21)	
<i>No</i>	200	49.50	5.11 (2.06)	
Have included children with ASD in PE classes				.47*
<i>Yes</i>	199	49.26	5.80 (1.97)	
<i>No</i>	205	50.74	4.82 (2.20)	
Have support from APE specialist				.32*
<i>Yes</i>	43	10.64	5.86 (2.44)	
<i>No</i>	287	71.04	5.19 (2.03)	
<i>Don't know</i>	78	18.32	5.42 (2.32)	
Have support from teacher assistants				Pairs of combination .10 to .23
<i>Yes</i>	60	14.85	5.68 (2.02)	
<i>No</i>	287	71.04	5.19 (2.12)	
<i>Don't know</i>	57	14.11	5.46 (2.34)	
Have support from SE teacher				Pairs of combination .01 to .16
<i>Yes</i>	189	46.78	5.49 (2.10)	
<i>No</i>	163	40.35	5.14 (2.11)	
<i>Don't know</i>	52	12.87	5.12 (2.36)	
Have support from physical therapist				.54*
<i>Yes</i>	37	9.16	6.27 (2.03)	
<i>No</i>	303	75.00	5.13 (2.12)	
<i>Don't know</i>	64	15.84	5.56 (2.18)	
Have support from psychologist				.51*
<i>Yes</i>	25	6.19	6.04 (1.74)	
<i>No</i>	162	40.10	4.97 (2.15)	
<i>Don't know</i>	217	57.71	5.46 (2.15)	
Personal experiences with ASD				.40*
<i>No experience</i>	372	97.08	5.25 (2.16)	
<i>Friend</i>	29	7.18	6.10 (1.81)	
<i>Family member</i>	3	.74	3.47 (.74)	
1. ME, VE & SP	124	30.69	5.91 (1.90)	1. and 5. = .43* 3. and 5. = .52* 1. and 8. = .58* * 3. and 8. = .60* Other pairs of combination .06 to .37
2. ME & VE	27	6.68	5.53 (2.29)	
3. ME & SP	23	5.69	6.03 (1.73)	
4. VE & SP	4	.99	4.55 (3.00)	
5. ME only	54	13.37	5.10 (1.80)	
6. VE only	23	5.69	5.22 (2.16)	
7. SP only	6	1.49	6.07 (2.57)	
8. ME, VE & SP did not have	143	35.40	4.69 (2.29)	
Total	404		5.30 (2.14)	

Note. $n = 404$. APE = adapted physical education; SE = special education; ASD = autism spectrum disorders; PE = physical education; ME = mastery experience; VE = vicarious experience; SP = social persuasion; Hedges' g values = approximately medium (.20 to .50) to significant (.50 to .80) effect size (Cohen, 1988).

We used Spearman's rank correlation coefficient to find the strength of the associations between the self-efficacy scores and demographic factors, and other personal attributes. Results showed that the relationship between self-efficacy and whether participants had undertaken adapted PE courses was weak ($r = .136$) and statistically significant ($p < .01$). Results also showed that the relationship between self-efficacy and inclusion of children with ASD in PE classes was weak ($r = .225$) and statistically significant ($p < .01$). The correlation between self-efficacy and gender, age, years of experience teaching PE, and participants having undertaken special education courses, was weak and not statistically significant.

We performed correlation analysis to find the strength of the associations among all the scales (self-efficacy, ME, VE, SP, physiological state, behavior, and perceived challenges). We then performed correlation analysis with the total sample ($n = 404$), and separately with participants who had the three types of experience (ME, VE, SP; $n = 124$), those who had one or two of the types of experience (ME, VE, SP; $n = 137$), and those who had none of the types of experience ($n = 143$). Calculated Spearman's rank correlations coefficients showed that the relationships were weak or moderately strong, and the p values were statistically significant (see Table 2).

Table 2. Means, Standard Deviations, and Correlations of Scales According to Teachers' Types of Experience

Subsample	Variable	<i>M</i> (<i>SD</i>)	1	2	3	4	5	6	7
Had the three experiences (ME, VE, SP; $n=124$)	1. Self-efficacy	6.04 (1.86)	---	.57**	.50**	.35**	-.32**	.41**	-.32**
	2. Mastery experience	3.11 (0.89)		---	.72**	.62**	-.23**	.52**	-.30**
	3. Vicarious experience	2.98 (0.94)			---	.54**	-.15	.47**	-.35**
	4. Social persuasion	3.56 (1.00)				---	-.20*	.52**	-.35**
	5. Physiological state	2.69 (1.07)					---	-.26**	.43**
	6. Behavior	3.71 (0.84)						---	-.29**
	7. Perceived challenges	3.14 (0.73)							---
Had one or two experiences (ME, VE, SP; $n=137$)	1. Self-efficacy	5.39 (2.02)	---	.37**	.12	.18*	-.29**	.22*	-.36**
	2. Mastery experience	2.21 (1.45)		---	-.23**	-.05	-.34**	.58**	-.35**
	3. Vicarious experience	1.16 (1.58)			---	-.30**	.02	-.05	-.05
	4. Social persuasion	.75 (1.48)				---	.05	.11	-.08
	5. Physiological state	2.96 (1.06)					---	-.21*	.40**
	6. Behavior	2.87 (1.42)						---	-.25**
	7. Perceived challenges	3.37 (0.86)							---
Had no experiences ($n = 143$)	1. Self-efficacy	4.69 (2.29)	---	---	---	---	-.25*	.23**	-.21*
	2. Mastery experience	---		---	---	---	---	---	---
	3. Vicarious experience	---			---	---	---	---	---
	4. Social persuasion	---				---	---	---	---
	5. Physiological state	3.31 (1.21)					---	-.19*	.41**
	6. Behavior	1.06 (0.45)						---	-.11
	7. Perceived challenges	3.56 (1.09)							---
Total sample size ($n = 404$)	1. Self-efficacy	5.30 (2.14)	---	.36**	.28**	.27**	-.31**	.32**	-.33**
	2. Mastery experience	1.70 (1.63)		---	.55**	.61**	-.30**	.81**	-.31**
	3. Vicarious experience	1.31(1.61)			---	.59**	-.18**	.56**	-.24**
	4. Social persuasion	1.35 (1.82)				---	-.19**	.61**	-.25**
	5. Physiological state	3.00 (1.14)					---	-.29**	.43**
	6. Behavior	2.49 (1.48)						---	-.30**
	7. Perceived challenges	3.37 (0.93)							---

Note. ME = mastery experience; VE = vicarious experience; SP = social persuasion; * = $p < .05$, ** = $p < .01$.

We performed stepwise multiple regression analysis to examine which demographic factors/personal attributes and which of the sources of self-efficacy (ME, VE, SP, PS) influenced the PE teachers' self-efficacy in the inclusion of children with ASD in PE classes (see

Table 3). A second stepwise multiple regression analysis was performed to determine the degree to which self-efficacy and perceived challenges predicted the behavior of PE teachers in the inclusion of children with ASD (see Table 3).

Table 3. Results of Stepwise Regression for the Prediction of Physical Education Teachers' Self-Efficacy and Behavior Toward Inclusion of Children With Autism Spectrum Disorders in Physical Education Classes

Subsample	Variable	Predictors	R ²	F	df	p	Effect size Cohen's f ²
Total sample size (n = 404)	SE	Had students with ASD in PE class x had APE course or seminar	.066	14.24	2; 403	.001	.07
	SE	ME x PS x VE	.193	31.84	3; 403	.001	.24
	BEH	SE x PCH	.135	31.36	2; 403	.001	.16
Had the three experiences (ME, VE, SP; n = 124)	SE	ME x PS x VE	.400	26.64	3; 123	.001	.60
	BEH	SE x PCH	.222	17.26	2; 123	.001	.29
Had one or two experiences (ME, VE, SP; n = 137)	SE	PS x SP x VE x ME	.285	13.16	4; 136	.001	.40
	BEH	PCH	.075	10.96	1; 136	.001	.08
Had no experiences (n = 143)	BEH	SE	.051	7.62	1; 142	.007	.05

Note. SE = Self-efficacy; ME = mastery experience; VE = vicarious experience; SP = social persuasion; PS = physiological state; BEH = behavior; PCH = perceived challenges; APE = Adapted physical education; ASD = autism spectrum disorders; PE = physical education; f² = Cohen's coefficient for effect size in multiple regression = f² ≥ .02 (small), f² ≥ .15 (medium), f² ≥ .35 (large; Cohen, 1988).

From the correlation and multiple regression analysis results, we developed a path model to capture the most plausible theory of change linking proximity to participants' self-efficacy, and the sources of self-efficacy, behavior, and perceived challenges (see Figure 1), using the sample of participants who had all three types of experience (n = 124). Estimated weights, correlations between standard errors, and R² are presented in Figure 1. The standardized regression weights represent the amount of change in the dependent variable that is attributable to a single standard deviation unit of change in the predictor variable (see Figure 1). We estimated that the predictors of self-efficacy explained 36% (R² = .360), the predictors of behavior explained -11.6% (R² = -.116), and the predictors of perceived challenges explained 13.1 % (R² = .131) of its variance. To improve the model-data fit, the Amos software automatically created a "modification index", which suggested several errors (residuals, designated as an e + number in

Figure 1) to be correlated. A chi-square probability value greater than .05 indicated acceptable model fit: chi square (7) = 13.23; p = .067. The other goodness-of-fit measures also demonstrated an acceptable model fit: The normed fit index (NFI; .958) and comparative fit index (CFI; .979) exceeded the .90 cutoff criteria and the root mean square error of approximation (RMSEA; .085) demonstrated moderate fit to the model (Figure 1). The results confirmed that self-efficacy was most strongly influenced by mastery and vicarious experiences, and self-efficacy strongly influenced behavior and perceived challenges. Results also showed that the influence of mastery and vicarious experiences on self-efficacy was stronger when social persuasion was included. Behavior also affected the perception of challenges, in that, when teachers modified equipment, activities, and rules for children with ASD in the class, they perceived challenges much less often.

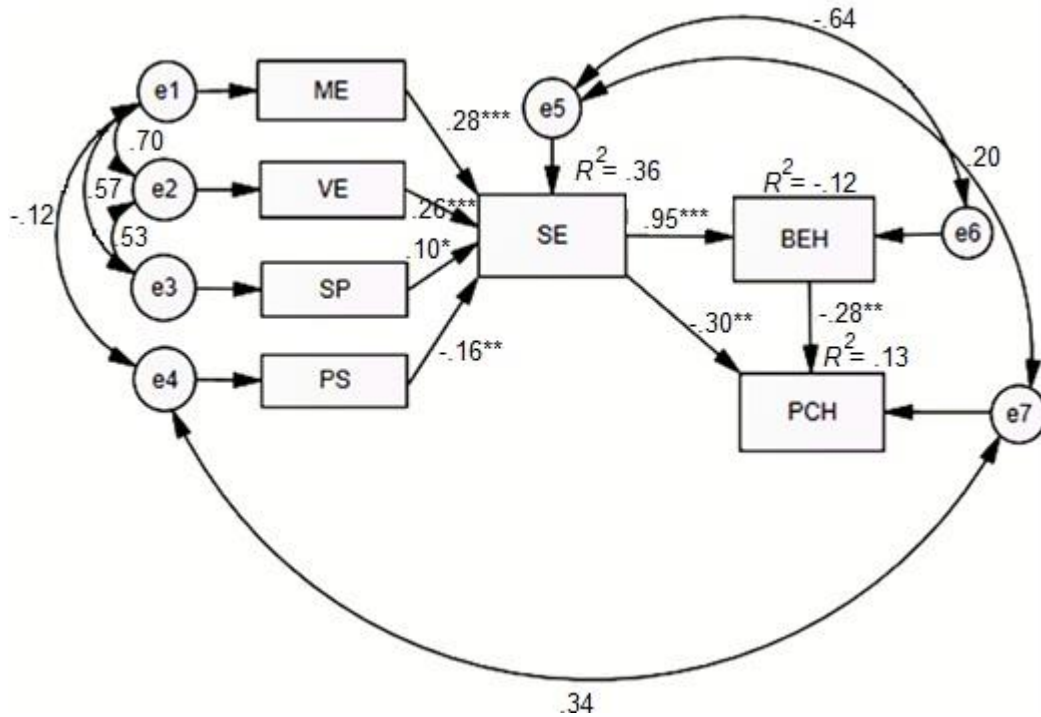


Figure 1. Path model fit ($n = 124$). \rightarrow = standardized regression weights; \leftrightarrow = correlations; e = error variance; SE = Self-efficacy; ME = mastery experience; VE = vicarious experience; SP = social persuasion; PS = physiological state; BEH = behavior; PCH = perceived challenges; ***, **, and * = standardized total path coefficients are significant at .001, .01, and .05 level of probability.

Chi square (χ^2) p value was calculated to find the differences in responses to the perceived challenges scale statements between PE teachers, who had the experience of including children with ASD in classes during the last 5 years ($n = 199$), and PE teachers, who had no such experience ($n = 205$). PE teachers, who had the experience of including children with ASD assessed the challenges they faced by inclusion of these

children. PE teachers who had not had children with ASD in their classes assessed the challenges they would face if they were to include pupils with ASD. The frequency of challenges most often faced by teachers in inclusive PE classes by percentage, and the extent to which these challenges affected the inclusion of children with ASD in PE classes are shown in Table 4.

Table 4. Distribution of Responses to Perceived Challenges Scale Statements Between Participants With or Without Experience of Including Children With Autism Spectrum Disorders in Physical Education Classes

Items of perceived challenges scale	Participants' groups	Items of variants					χ^2 * $p < .05$
		Not at all an issue (%)	Not much of an issue (%)	Sometimes an issue, sometimes not an issue (%)	Somewh at of an issue (%)	Very much an issue (%)	
I am not sure how to modify activities	Including	13.57	22.61	42.21	15.58	6.03	34.56*
	Not including	11.22	15.12	26.34	24.39	22.93	
I do not have time to make modifications	Including	16.58	24.12	30.15	23.12	6.03	18.56*
	Not including	9.76	21.46	24.88	24.88	19.02	
I do not have appropriate equipment	Including	12.56	19.10	25.13	31.16	12.06	21.55*
	Not including	7.32	12.20	23.41	27.32	29.76	

I have large class sizes	Including	8.04	12.56	21.11	25.63	32.66	3.06
	Not including	7.32	9.27	17.56	26.34	39.51	
There are multiple classes in the gym	Including	7.04	12.06	18.09	27.14	35.68	2.96
	Not including	7.80	7.80	16.59	26.34	41.46	
The student's skill level is very different from his/her peers	Including	9.05	16.58	33.17	27.64	13.57	12.09*
	Not including	5.37	11.71	26.34	32.20	24.39	
I have no aid or support to help	Including	7.54	19.10	24.62	34.17	14.57	21.63*
	Not including	5.85	9.27	23.90	28.78	32.20	
I do not have information about the student	Including	17.09	21.61	29.65	20.60	11.06	26.07*
	Not including	8.29	16.10	20.00	31.22	24.39	
I have limited training on autism	Including	15.58	16.08	28.14	26.63	13.57	26.89*
	Not including	5.37	14.63	18.54	32.20	29.27	
The student has behavior problems	Including	6.03	17.59	33.67	33.67	9.05	19.18*
	Not including	5.85	10.73	25.37	34.15	23.90	
The student has problems staying on task	Including	9.05	21.61	34.17	25.13	10.05	17.10*
	Not including	8.29	16.59	22.93	28.78	23.41	

Note. Participants were divided into two groups according to whether or not children with ASD were included in their classes. They chose from 11 situations that they perceived as challenges that could make it difficult for them to successfully include children with ASD in PE classes. Participants evaluated the items to show how each situation they personally perceived as complicating the possibility of meaningfully including children with ASD in PE classes. Percentages for variants of items indicate how many participants have chosen each.

Discussion

We found that there was a moderate level of self-efficacy toward the inclusion of children with ASD in PE classes among the Lithuanian PE teachers who were the participants in our study. This shows that the teachers did not feel well prepared for the inclusion of children with ASD in their classes. Our result thus indicates that there is a significant difference in level of self-efficacy between PE teachers in Lithuania and the US in regard to inclusion of children with ASD in classes. In a study based on measurement with the PESEISD-A, Taliaferro, Hammond, and Wyant [17], found that the level of self-efficacy among a group of U. S. students in programs training as PE teachers was from eight to nine out of the possible score of ten, where ten meant that the student's response was that he or she was "highly certain that he or she could do" the task. This shows that although a law has been passed in Lithuania for inclusive education of children with SEN in regular education classes, in practice, this development is facing obstacles, such as a lack of teachers trained for inclusive education. Ensuring that teachers are trained for working with children with different educational needs, and continual improvement of their qualifications and competencies is one of the main challenges that education systems are facing, not only in Lithuania, but also in other countries in Europe [8].

Our study results revealed that the self-efficacy of the PE teachers who were the participants was positively influenced when they had attended adapted PE courses or seminars, and by children with ASD being included in classes, by support from adapted PE specialists, physiotherapists, and psychologists, and by having friends or a family member with ASD. However, very few of our participants had attended these courses and seminars, or had received specialist support.

The results reported by Beamer and Yun [4] and by Taliaferro [16] indicated that the experiences of the teachers who took part in their studies predicted their self-efficacy toward the inclusion of children with ASD. Mastery experience is the strongest source for the development of self-efficacy [2]. However, for PE teachers, the impact of mastery experiences on their self-efficacy depends on how they succeed in including children with ASD in classes [3]. Examples that illustrate a need to develop teacher self-efficacy are that children with ASD were integrated into a PE class, but the teacher did not include them in physical activities, that the PE teacher tried to

include children with ASD, but failed, or that the PE teacher included children with ASD and it seemed to be successful. PE teachers' self-efficacy may thus decrease or even increase significantly. Thus, appropriate knowledge or support from other professionals is required [6].

Taliaferro [16] identified that when the PE teachers who were her participants undertook adapted PE courses, had a statistically significant effect on their self-efficacy. However, Taliaferro and Harris [18] also found that the effectiveness of transferred knowledge from adapted PE courses depends on how the knowledge is transferred, and the amount of knowledge involved. For example, attendance at a one-day workshop did not have a significant impact on the physical-educator participants' self-efficacy in regard to inclusion. The results of a systematic review of literature covering the period from 1975 to 2015 on inclusion in PE [19] confirm that a major limitation in inclusive education is the lack of adapted PE training. Tant and Watelain [19] therefore suggested that adapted PE training should be carried out regularly to ensure continuity in the acquisition of this knowledge. Hassan, Ahmed, and Alasmari [9] found in their study on attitudes of special educators toward educating children with autism that teachers who took special courses on inclusive education (vs. those who had not) demonstrated more positive attitudes. It is, thus clear that it is necessary to find out which specific knowledge and which ways of conveying knowledge are effective in developing the self-efficacy of PE teachers toward inclusion of children with ASD.

Beamer and Yun [4] and Taliaferro [16] found that, in the US, the support that PE teacher participants received for including children with ASD in PE classes was mostly provided by special education teachers and teacher assistants. According to Beamer and Yun, almost 80% of the teacher participants in their survey received special education teachers' support when children with ASD were included in PE classes. In our study, such support was available for only about 47% of our participants, and this was the most common type of support that the teachers reported they had received. We found noticeable differences between the data concerning support from teacher assistants in Beamer and Yun's [4] survey, and in our survey. In our study, only about 15% of the Lithuanian teachers had teacher assistants, whereas 72% of teachers who were the participants in Beamer and Yun's U.S. study stated that such support was available. In addition,

76% of teacher participants interviewed in Beamer and Yun's survey reported that adapted PE specialists' support was available. In contrast, our results showed that only about 11% of the PE teacher participants in our study reported the availability of adapted PE specialist support. We also found that support from a physiotherapist (9%) and a psychologist (6%) positively influenced the self-efficacy of the PE teachers who took part in our study. However, very few PE teacher participants received this support.

Our identification of the relationships between the SE scores and the ME, VE, SP, and PS scores enabled us to establish which sources and combination of sources made the greatest impact on PE teacher participants' self-efficacy toward including children with ASD in classes. Our results confirmed those of Bandura [2] and other scientists [11], [13], [16], [17], [20] that mastery experiences play a significant role in the development of self-efficacy. We also found that PE teachers with greater self-efficacy had less stress and worry when they had to include children with ASD in PE classes, which is in line with the finding reported by Taliaferro [16]. This result shows that when PE teachers' self-efficacy toward inclusion of children with ASD is being developed, it is important to pay attention to the improvement of the psychological well-being of the teachers to reduce stress and manifestation of negative emotions. Our regression analysis results showed that the combination of ME, PS, and VE sources of self-efficacy had the most effective impact on developing PE teacher participants' self-efficacy toward inclusion of children with ASD. These results are confirmed by the finding reported by Ozyilmaz et al. [13] of a relationship between teachers' mastery and vicarious experiences and their self-efficacy toward inclusive education.

Correlation analysis results showed that greater self-efficacy enabled our participants to create a more inclusive environment for children with ASD in the PE class, and vice versa. The correlation between the results for the self-efficacy, behavior, and perceived challenges scales led us to the conclusion that the more often there is an inclusive environment for children with ASD in classes, the less importance is given to situations that hinder a meaningfully inclusive PE class. Our correlation analysis results showed that the teachers' perceptions of challenges significantly influenced their self-efficacy. Taliaferro's [16] multiple regression analysis results also indicated that the linear combination

of self-efficacy and perceived challenges were significantly related to teachers' behavior. Thus, PE teachers with strong self-efficacy will be more likely to include children with ASD in PE classes, and to attempt difficult tasks to ensure the qualitative inclusion of these children.

From the correlation and multiple regression analysis results, we formed a path model, which helped to reveal causal relationships between the sources and teachers' self-efficacy, behavior, and perceived challenges. The path analysis results confirmed a model for the development and influence of self-efficacy beliefs of PE teachers in an inclusive PE class: Lithuanian PE teacher participants' self-efficacy toward inclusion of children with ASD was most affected by mastery experience, vicarious experience, and physiological state. Their behavior and their perception of challenges depended on the influence of these sources on their self-efficacy. In addition, their behavior was related to their perceptions about challenges, that is, the more inclusive learning environment they created, the less they perceived challenges that can make it difficult for children with ASD to be included in PE classes [16].

Taking into account all our results, we formulated a strategy for the development of self-efficacy of PE teachers: continual adapted PE courses or seminars based on mastery and vicarious experiences, methods that enhance the PE teachers' psychological state, and support teams of specialists that include adapted PE specialists, physiotherapists, and psychologists.

We analyzed the perceived challenges scale to identify the challenges that Lithuanian PE teachers perceive that they face most often, according to whether or not they had children with ASD in their classes. This analysis helps understanding of the difficulties faced by PE teachers think they would face when including children with ASD in their classes and the difficulties they face when they have children with ASD in their classes. The analysis revealed that the main challenges for both groups of PE teachers were associated with the management of large classes with many children, and with the lack of support for the teachers. In addition, PE teachers who had children with ASD in their classes were experiencing a common difficulty of not having appropriate equipment, and PE teachers who did not have children with ASD in their classes believed that their limited training for working with children with ASD would also cause serious difficulties. We thus concluded from our

results that multiple classes being held at the same time in a gymnasium and large class sizes are the biggest barriers for the inclusion of children with ASD in PE classes. Unianu [21] stated that in an inclusive learning environment is important to reduce the number of students, provide support for the teacher and devote more time for the teacher to prepare the curriculum, and create and develop favorable opportunities for cooperation between teachers, students, and parents. Obrusnikova and Dillon [12] found that when including children with ASD in PE classes, PE teachers most often experience challenges related to cooperative, competitive, and individualistic learning situations. Obrusnikova and Dillon [12] concluded that PE teachers must acknowledge potential teaching challenges, such as planning for and addressing students' inattentive and hyperactive behavior, social behavior difficulties, and emotional regulation difficulties.

Conclusions

There are limitations in this study. We did not assess whether or not there were children with ASD attending the schools involved in the study. Also, our results would be reinforced if it were known how many children with ASD had been included in PE classes during last 5 years. Nevertheless, it is clear from our results that it is necessary to develop strategies for PE teachers' self-efficacy education, and that the impact of those strategies on the PE teachers' self-efficacy sensitivity toward inclusion of children with ASD is assessed. In addition, as we assessed PE teachers' self-efficacy toward inclusion only of children with moderate ASD, future researchers should investigate PE teachers' self-efficacy toward inclusion of children with ASD at different levels of severity. Finally, PE teachers' self-efficacy should be continually monitored, as the inclusion of children with ASD in PE classes is a constantly changing process.

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