

Students' attitudes and predispositions toward physical education in Greece

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Published online: September 30, 2018

(Accepted for publication August 08, 2018)

DOI:10.7752/jpes.2018.03238

Abstract

Problem statement: Although the study of students' attitudes toward physical education (PE) is of particular importance, there are only a few tools that study a variety of factors. Developing a tool that evaluates various factors helps to a better understanding of students' attitudes.

Purposes: The purposes of this research were: (a) the development, and investigation of reliable and valid instruments that evaluate students' attitudes and predispositions toward PE, the assessment in PE, and how attitudes related to factors 'enjoyment' and 'effort,' (b) the examination of the statistically significant differences in grade, age, gender, and teacher's gender, (c) the analysis of the correlations between the factors of the questionnaires.

Method: A total of 638 students (327 boys, 311 girls) participated from fifth, sixth, seventh and tenth grade. Attitudes towards Physical Education were measured through Phillips and Silverman (2012) questionnaire, while Predispositions towards Physical Education were assessed through Hilland, Stratton, Vinson, and Fairclough Physical Education Predisposition Scale (2009). Furthermore, a scale of 8 items was developed to assess Attitudes toward assessment in Physical Education. In addition, effort and enjoyment were measured.

Results: All factors demonstrated acceptable internal consistency ($\alpha > .70$) and confirmatory factor analysis confirmed structural validity of the scales. A one-way analysis of variance and post hoc test revealed that attitudes toward PE and toward assessment in PE were significantly higher in fifth, sixth and seventh grade compared with tenth grade students. Strong positive correlation was revealed between cognitive and affective factor. A total of 58% of enjoyment, and 44% effort were explained by the independent variables.

Conclusions: The high validity and reliability of these instruments along with the variety of factors investigated, provide a strong base to conduct future research on students' attitudes.

Key Words: Validity of scale, attitude, predisposition, evaluation

Introduction

Attitudes have been the subject of research over many years, and most theorists agree that they are learning products (Singer, Eberspaecher, Boes, & Rehs, 1980; Erdmann, 1983). 'An attitude is a disposition to respond favorably or unfavorably to an object, person, institution, or event' (Ajzen, 2005, p. 3), characterized by an evaluative (pro-con, pleasant-unpleasant) nature (Ajzen, 2005).

The link with education exists because it is suggested that if pupils have positive experiences in physical education and develop positive attitudes towards physical activity, students will likely be motivated to engage in physical activity out of school too (Solmon & Lee, 1996; Wallhead & Buckworth, 2004; Silverman, 2005). In Greece, physical activity guidelines are aligned with the World Health Organization (2017), which recommends that children and adolescents aged 5-17 years should participate every day in at least 60 min of moderate-to-vigorous intensity physical activity. However, recent data have indicated that physical activity levels decline during adolescence and only 36% of grade 9 to 12 students meet recommended guidelines for physical activity (Cox, Smith, & Williams, 2008). Furthermore, according to an estimation of 105 countries 80.3% (95% CI 80.1-80.5) of adolescents aged 13 to 15 did not reach the 60 min of moderate to vigorous physical activity per day (Liu & Chung, 2014). The decline of physical activity may have negative consequences in cardiovascular, skeletal and psychological health (Liu & Chung, 2014; Cox, Smith, & Williams, 2008). Physical education is one of the most strongly recommended interventions for increasing students' physical activity (Liu & Chung, 2014). Thus, the investigation of students' attitudes may provide useful information about what they think and feel of physical education that could be used to make the appropriate changes to the curriculum (Marttinen, Fredrick & Silverman, 2018) to influence future behavior and promote regular physical activity. Moreover, a positive attitude toward PE encourages students to maintain an active lifestyle (Säfvenbom, Haugen & Bulie, 2015). According to Subramaniam and Silverman (2000), understanding students' attitudes toward physical education is of great significance as it mediates student achievements.

Students' strongest predictor for continued participation in PE is 'enjoyment', which includes elements of fun, challenge, and success (El-Sherif, 2016). More specifically, 'enjoyment is defined as a positive affect

related to feelings of pleasure, liking and fun' (Jaakkola, Yli-Piipari, Watt, Liukkonen, 2016, p.751) and seems to foster positive attitudes and participation in physical education (Prochaska, Sallis, Slymen, & McKenzie, 2003). Previous studies have indicated enjoyment as the link with engagement in PE, physical activity and leisure time in adolescents. (Jaakkola, Yli-Piipari, Watt, & Liukkonen, 2016).

The theoretical framework for most studies that assess students' attitudes in PE is the two-component view of attitude, which provides the researchers with reliable and valid scores. (Subramaniam & Silverman, 2007). According to this theoretical view, attitude involves the cognitive and affective dimensions (Dismorea & Bailey, 2011). The cognitive dimension refers to a person's beliefs, knowledge or opinions about the attitude object (Ajzen, 2005). Attitudes of this dimension can be inferred with expressions of beliefs about attitude object (Ajzen, 2005). The affective dimension refers to a person's feelings and evaluation (Ajzen, 2005), and it suggests how favorable or unfavorable is someone's attitude opinions for a matter (Fishbein and Ajzen, 2010). Attitudes of the affective dimension can be inferred with expressions of feelings toward attitude object (Ajzen, 2005). This theoretical approach also allows grade level and gender comparisons (Subramaniam & Silverman, 2007).

A number of tools have been developed to assess students' attitudes and predispositions toward physical education. The most common form in the research on students' attitudes has been the qualitative analysis tools, which through Likert - type scale questionnaires provide easier collection and analysis of student responses (Phillips & Silverman, 2007). Some other tools use qualitative analysis, like student interviews, which reveal insights and allow for clarification of students' ideas. However, this method may be very demanding. There is also the combination of quantitative and qualitative methods design (Lovelace & Brickman, 2013).

Subramaniam and Silverman (2000), developed and validated an instrument, in order to assess middle school students' attitudes, using the two-component view of attitude. A range of 20 items questionnaire was used to assess the primary factors enjoyment and perceived usefulness, with subfactors the physical education teacher, the curriculum, and peers. Subramaniam and Silverman (2007), further assessed middle school students' attitudes toward PE using the above-validated instrument. In addition, they investigated whether gender and grade level influence student attitudes. Afterward, Phillips and Silverman (2012), developed a reliable and valid tool for assessing students' attitudes of fourth and fifth grade towards the physical education lesson. The cognitive and affective factors were evaluated, with subfactors the curriculum, and the teacher. The two above instruments of Subramaniam and Silverman (2000), and Phillips and Silverman (2012) had been successfully validated with a sample of sixth grade students (Donovan, 2015). Furthermore, Hilland, Stratton, Vinson, and Fairclough (2009), developed and psychometrically tested the Physical Education Predisposition Scale. The aim was to evaluate the 'perceived PE worth' (enjoyment and attitude) and 'perceived PE ability' (competence and self-efficacy), of secondary school students. The Physical Education Predisposition Scale was further psychometrically tested with a sample of Australian students (Hilland, Brown & Fairclough, 2017).

The purpose of this research was: (a) to develop four reliable and valid instruments in the Greek language, based on the theories of attitudes and psychometry, that can assess students' attitudes and predispositions toward physical education as well as assessment in physical education. Also, to investigate how the factors of 'enjoyment' and 'effort' relate to their attitudes toward PE, (b) to study the differences between grades (5, 6, 7 and 10), gender, and teacher's gender, (c) to analyse the correlations between the factors of the questionnaires. Furthermore, to examine the relation between motivational outcomes (e.g. effort and enjoyment) and attitudes.

Material & Methods

Participants

A total of 638 students (327 boys and 311 girls), aged 10 – 15 years old (mean = 12.81), participated in this study. The students were attending grade 5 and 6 of elementary school, 7 and 10 of secondary school. Eight schools were selected from Athens, and we had 33 classes in total. The project received approval from the Directorate of Primary and Secondary Education as well as from the Institute for Educational Policy of Greece.

Measures

Attitudes towards Physical Education. The Phillips and Silverman (2012) scale was used to measure students' attitudes regarding 'cognitive' and 'affective' factors. A range of 8-item questionnaire was used to assess the 'cognitive' factor (e.g., The activities I learn in my physical education class are useful to me) and 6-item questionnaire to assess the 'affective' factor (e.g., The activities I do in my physical education class get me excited about coming to class). The students were required to respond to each statement on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Predisposition towards Physical Education. The Hilland, Stratton, Vinson, and Fairclough Physical Education Predisposition Scale (2009) was used to measure students' predispositions regarding 'perceived PE worth,' and 'perceived PE ability.' A range of the 10-item questionnaire was used to assess the factor 'perceived PE worth' (e.g., What I learn about PE is not important to me) and a 7-item questionnaire to assess the factor 'perceived PE ability' (e.g., I think I have the skills I need to participate in the PE lesson). The students were required to respond to each statement on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Attitudes toward assessment in Physical Education. A scale of 8 items was composed by the researchers to assess 'attitudes towards assessment in PE' (e.g., The assessment process in PE class is important for learning). The students were required to respond to each statement on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Perceived Effort and Enjoyment. Two subscales of the Intrinsic Motivation Inventory (IMI) (McAuley, Duncan & Tammen, 1989) were used to measure students' enjoyment and effort in the PE class. A 4-item scale was used to assess 'enjoyment' (e.g., On this physical education class, I enjoy very much) and a 5-item scale to assess 'effort' (e.g., On this physical education class, it is important for me to do well in the class). The students were required to respond to each statement on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Procedures

The methodology, which was used to construct an instrument that is subject to the rules of psychometry and assesses students' attitudes and predispositions toward physical education, summarizes in the following stages:

Translation of the queries: a back-translation process was followed: (a) initially they were translated from English to Greek; (b) then a second expert translated the questionnaires from Greek to English; (c) the comparison of questions' translation followed.

Informed consent: Written parental and student consent received from all participating students and their parents. Students voluntarily participated in the study.

Statistical analysis

The statistical package for social sciences (SPSS v.21) was used, while AMOS (v.18.0) was used for the confirmatory factor analysis. The internal consistency and reliability analysis of the scales had been examined through Cronbach's alpha (α). A one-way analysis of variance (ANOVA) was used to examine the differences of the variables in relation to the grade (5, 6, 7 and 10); and to examine differences in students' gender (boy, girl) and the physical education teachers' gender. Pearson correlation coefficients were used to examine the strength of relationships between variables. Regression analysis was conducted to examine the predictability of the dependent variables in relation to the independent variables.

Results

Internal consistency and construct validity of scales

The internal consistency of each subscale (see Table 1) was examined by Cronbach's alpha (Cronbach, 1951). For the Phillips and Silverman scale (2012), Cronbach's alpha demonstrated high levels of internal consistency ('cognitive' factor, $\alpha = .86$; 'affective' factor, $\alpha = .83$), while Confirmatory Factor Analysis showed that the model fitted the data well ($\chi^2 (53) = 323.35$, $p < .001$, TLI = .91, CFI = .92, RMSEA = 90% CI = .08 - .09).

For the Physical Education Predisposition Scale, Hilland, Stratton, Vinson and Fairclough (2009), Cronbach's coefficient alpha demonstrated adequate internal consistency ('perceived PE worth', $\alpha = .81$; 'perceived PE ability', $\alpha = .77$), while the Confirmatory Factor Analysis showed that the model fitted the data well, ($\chi^2 (75) = 264.432$, $p < .001$, TLI = .911, CFI = .927, RMSEA = .063, RMSEA 90% CI = .055 - .071).

Table 1. Internal consistency of the questionnaire factors

Factors	Alpha
1. Cognitive	.86
2. Affective	.83
3. Perceived PE worth	.81
4. Perceived PE ability	.77
5. Attitudes toward assessment in PE	.87
6. Enjoyment	.84
7. Effort	.82

For the scale 'Attitudes toward assessment in PE' Principal components analysis and exploratory factor analysis were completed to diagnose items and factors. The results showed one component with eigenvalue exceeding 1. The direct oblimin rotation was used revealing a one-factor structure, which accounted for 52% of the variance with loadings over .60. Confirmatory Factor Analysis was used to examine the construct validity and showed that the model fitted the data well, ($\chi^2 (20) = 103.744$, $p < .001$, TLI = .941, CFI = .958, RMSEA = .081, RMSEA 90% CI = .066 - .097). The reliability analysis demonstrated that the scale had acceptable internal consistency, $\alpha = .87$. For the IMI scales Cronbach's alpha coefficient demonstrated high internal consistency levels ('enjoyment', $\alpha = .84$; 'effort', $\alpha = .82$).

Examining differences in education level and gender

One-way anovas statistical analysis (see Table 2) was used to examine whether there were statistically significant differences in student attitudes regarding the dependent variables, cognitive, affective, perceived PE worth, perceived PE ability, attitudes toward assessment in PE and the grade level, e.g, grade 5-6 (age 10, 11), grade 7 and grade 10 (age 12 and 15).

Regarding the cognitive factor: From the results, it is concluded that there were statistically significant differences between the groups $F_{(2,635)} = 63.22, p < .001$. Post-hoc Scheffe tests were calculated at confidence level $p < .05$. The results indicate that a statistically significant difference exists between grade 10 and grade 5-6 ($p < .001$) and between grade 10 and grade 7 ($p < .001$).

Regarding the affective factor: From the results, it is concluded that there were statistically significant differences between groups $F_{(2,635)} = 40.19, p < .001$. Post-hoc Scheffe tests were calculated at confidence level $p < .05$. The results indicate that a statistically significant difference exists between grade 10 of secondary school and grade 5-6 of elementary school ($p < .001$) and between grade 10 and grade 7 of secondary school ($p < .001$).

Table 2. Results of One-way analysis of variance in terms of school grade.

Factors	Elementary school Grade 5 - 6		Secondary school Grade 7		Secondary school Grade 10	
	MO	Sd	MO	Sd	MO	Sd
Cognitive	4.27	.74	4.15	.66	3.56	.83
Affective	4.21	.75	4.23	.59	3.67	.81
Perceived PE worth	4.22	.65	4.02	.57	3.46	.71
Perceived PE ability	4.26	.64	4.17	.60	3.90	.72
Attitudes toward assessment in PE	4.23	.69	3.84	.63	3.21	.75

Regarding perceived PE worth: The results suggest that there were statistically significant differences between groups $F_{(2,635)} = 90.92, p < .001$. Post-hoc Scheffe tests were calculated at confidence level $p < .05$. The results indicate that a statistically significant difference exists between grade 10 and grade 5-6 ($p < .001$) and between grade 10 and grade 7 ($p < .001$).

Regarding perceived PE ability: The results suggest that there were statistically significant differences between groups $F_{(2,635)} = 20.33, p < .001$. Post-hoc Scheffe tests were calculated at confidence level $p < .05$. The results indicate that a statistically significant difference exists between grade 10 and grade 5-6 ($p < .001$) and between grade 10 and grade 7 ($p = .004$).

Regarding attitude toward assessment in PE: From the results, it is concluded that there were statistically significant differences between the groups $F_{(2,635)} = 142.16, p < .001$. Post-hoc Scheffe tests were calculated at confidence level $p < .05$. The results indicate that a statistically significant difference exists between groups ($p < .001$). A one-way analysis of variance was used to examine whether there were statistically significant differences in factors relative to the students' gender (boy, girl). The results (see Table 3) suggest that there

Table 3. Results of One-way analysis of variance regarding students' gender.

Factors	Boy		Girl	
	MO	Sd	MO	Sd
Cognitive	3.91	.84	3.93	.84
Affective	3.97	.75	3.95	.85
Perceived PE worth	3.86	.72	3.81	.79
Perceived PE ability	4.19	.65	3.96	.71
Attitudes toward assessment in PE	3.73	.85	3.67	.86

were statistically significant differences between girls and boys regarding the factor perceived PE ability, $F_{(1,636)} = 18.99, p < .001$. For the other factors, there were no statistically significant difference.

Similarly, a one-way analysis of variance was used to examine whether there were statistically significant differences in factors relative to teachers' gender (male, female). From the results (see Table 4) it is concluded that there were statistically significant differences depending on the gender of teachers in relation with attitudes toward assessment in PE, $F_{(1,636)} = 10.14, p = .002$. When students had female teacher, viewed more positively issues related with assessment. For the other factors, there were no statistically significant differences.

Table 4. Results of One-way analysis of variance regarding teachers' gender.

Factors	Male Teachers		Female Teachers	
	MO	Sd	MO	Sd
Cognitive	3.88	.80	3.93	.85
Affective	3.90	.80	3.98	.80
Perceived PE worth	3.73	.73	3.87	.76
Perceived PE ability	4.03	.70	4.09	.69
Attitudes toward assessment in PE	3.50	.85	3.76	.84

Correlations

From the correlation analyzes the following were observed (see Table 5):
 The *cognitive factor* had a statistically high correlation with the affective ($r = .775, p < .01$) and the factor perceived PE worth ($r = .783, p < .01$), while statistically moderate correlation was presented for the factor perceived PE ability ($r = .414, p < .01$) and the factor attitude toward assessment in PE ($r = .663, p < .01$).

The *affective factor* had a statistically high correlation with perceived PE worth ($r = .711, p < .01$) and enjoyment ($r = .711, p < .01$), while statistically moderate correlation was presented for factors perceived PE ability ($r = .402, p < .01$), attitude toward assessment in PE ($r = .563, p < .01$) and effort ($r = .483, p < .01$).

In addition, as far as the factor perceived PE worth was concerned, there was statistically a moderate correlation to factors perceived PE ability ($r = .513, p < .01$), enjoyment ($r = .689, p < .01$) and effort ($r = .604, p < .01$) while a statistically high correlation with the factor attitude toward assessment in PE ($r = .718, p < .01$) was presented. As far as the correlations for the factor perceived PE ability was concerned, a statistically mild correlation with the factor attitude toward assessment in PE was shown ($r = .451, p < .01$).

A multiple linear regression analysis was calculated to predict the dependent variable ‘enjoyment’ by using the following independent variables: cognitive, affective, perceived PE worth, perceived PE ability, attitudes toward assessment in PE. Preliminary analyses were performed to ensure there was no violation of the assumption of normality and linearity. The R from the regression analysis was .761, which is statistically significant, $F_{(5,632)} = 174.35, p < .001$. A total of 58% of enjoyment was explained by the five independent variables. From the independent variables, ‘affective,’ ‘perceived PE worth’ and ‘attitude toward assessment in PE’ contributed significantly to the prediction of the ‘enjoyment’ factor, while ‘cognitive’ and ‘perceived PE ability’ didn’t contributed significantly.

A multiple linear regression analysis was calculated to predict the dependent variable ‘effort’ by using the following independent variables: cognitive, affective, perceived PE worth, perceived PE ability, attitudes toward assessment in PE. Preliminary analyses were performed to ensure there was no violation of the assumption of normality and linearity. The R of the regression analysis was .668 which is statistically significant, $F_{(5,632)} = 101,86, p < .001$. A total of 44% of effort was explained by the five independent variables. The ‘Cognitive,’ factor, ‘perceived PE worth,’ and ‘attitudes toward assessment in PE’ contributed significantly to the prediction of the effort, while the factors ‘affective’ and ‘perceived PE ability’ didn’t contributed significantly.

Table 5. Correlations between factors.

	1.	2.	3.	4.	5.	6.	7.
1. Cognitive	1,00	,775**	,783**	,414**	,663**	,648**	,569**
2. Affective		1,00	,711**	,402**	,563**	,707**	,483**
3. Perceived PE worth			1,00	,513**	,718**	,689**	,604**
4. Perceived PE ability				1,00	,451**	,396**	,368**
5. Attitudes toward assessment in PE					1,00	,585**	,620**
6. Enjoyment						1,00	,498**
7. Effort							1,00

** . Correlation is significant at the 0.01 level (2-tailed).

Discussion

This study provides additional evidence of the construct validity and reliability of the scales used. The Confirmatory Factor Analysis showed that the model fitted the data well, while Cronbach's coefficient alpha demonstrated acceptable internal consistency for all the factors of the questionnaires. All the scales have provided valid scores for assessing students’ attitudes of grade 5, 6, 7 and 10 (Phillips & Silverman, 2012; Hilland, Stratton, Vinson & Fairclough, 2009), for all the factors that were investigated. Multiple linear regression analysis was calculated to predict the dependent variables ‘enjoyment’ and ‘effort.’ A total of 58% of enjoyment factor was explained by the independent variables, while 44% of effort factor was explained by the independent variables.

This study provides further insights regarding the attitudes of students as they progress from grade 5 to grade 10 and expands on previous findings identifying decreasing positive attitudes towards physical education as students age. Thus, there were statistically significant differences in grades (5, 6, 7 and 10) and by extension in pupils' age and attitudes regarding the below factors: cognitive, affective, perceived PE worth, perceived PE ability, and attitude toward assessment in PE. More specifically, it was observed for all the factors mentioned above, that as the education level and age increased, the pupils' attitude toward PE decreased. Initially, it looks like a small decline from grade 5 and 6 to 7, which becomes sharper from grade 7 to 10. The causes of such a sharp decline and the quest for ways that students will maintain the high positive attitudes found in grade 5 and 6 should be under consideration. Probably we should first examine the curriculum and the teaching goals as well as the assessment procedure. These results suggest that PE teachers should be more aware of the psychological differences between male and female students according to grade.

Furthermore, there were statistically significant differences between boys and girls regarding ‘perceived PE ability.’ This may happen because boys and girls have a different perception of enjoyment, ability, and success in PE (Subramaniam & Silverman, 2007). In previous studies, it was observed that girls compared to boys had less favorable individual attributes associated with physical activity such as 9% lower perceived competence in physical education at age of 8, 18% lower cardio-respiratory fitness, 44% lower eye-hand coordination, and higher percent body fat (Telford, Telford, Olive, Cochrane, Davey, 2016). Additionally, in adolescence, girls mature on average two years earlier than boys (Malina, Bouchard, & Bar-Or, 2004) and this is likely to affect boys and girls perceived PE ability (Thompson, Baxter-Jones, Mirwald & Bailey, 2003). The changes in girls body physiology results in changes in their psychology, such as a decrease in self-esteem and self-perception, as well as a low esteem for body image, which may result in negative feelings about their ability to perform in PE (Davison, Werder, Trost, Baker, & Birch, 2007; Murdey, Cameron, Biddle, Marshall, & Gorely, 2004). According to a research in Finnish schools, boys enjoyed more than girls in all clusters while girls enjoyment in PE had to be increased (Jaakkola, Wang, Soini & Liukkonen, 2015). Furthermore, students’ gender influences their interaction with teachers and consequently their engagement in physical education and physical activity (Azzarito & Solomon, 2005). Differences may also occur due to the different feedback that students received by gender. In particular, it was found that teacher feedback was gender differentiated according to the activity being taught, with boys to receive more benefit from the different types of feedback (Nicaise, Coggerino, Fairclough Bois, Davis, 2007). Moreover, positive discrimination in teachers’ feedback in favor of girls could improve their self-perception in PE (Nicaise, Coggerino, Bois, Amorose, 2006).

Regarding the differences in physical education teachers’ gender (male, female), the results suggest statistically significant differences regarding the factor ‘attitudes toward assessment in PE.’ Previous studies indicated that male physical education teachers were more positively oriented toward PE assessment (Ikonomopoulos, 2005), while in other studies women were more likely to use the evaluation (Vamvoukas, & Troulis, 1999). However, in this research, it appeared that students have more positive attitudes toward assessment in PE when they have a female PE teacher, and this needs further investigation, as there is no bibliographic information to justify such an outcome.

Furthermore, the evidence suggests a high correlation between cognitive and affective factors. It means that students are aware of the benefits, usefulness, and importance of their participation in the PE and at the same time they enjoy the lesson. Therefore, teachers in school obviously need to emphasize on both factors, as it seems that the one reinforces the other. Furthermore, a positive correlation is also seen in factors perceived PE worth and perceived PE ability, which agrees with the research by Hilland, Brown, and Fairclough, (2017). The children calculate what they are doing well and seek to do what they value as worthy (Barr-Anderson, Neumark-Sztainer, Schmitz, Ward, Conway, Pratt, Pate, 2008; Hilland et al., 2009). So, if the lesson of physical education provides opportunities for perceived ability and self-confidence among children, then they are more likely to enjoy it and thus retain their motivation. It shows that if physical education is entertaining, children will gain in perceived ability and self-efficacy (Ebbeck, 2015), something that is extremely important for motivating them, as they will appreciate the lesson of Physical Education too. As far as attitudes towards assessment in PE, we see a high correlation with the factor ‘perceived PE worth’. It seems that learners who value PE participate in every process associated with the subject, such as the assessment process.

Additionally, the tools used are aligned with the dual component view of attitude and the Theory of Reasoned Action. The findings confirm the view that the interpretation of attitudes is based on two factors. This view is dominating among the researchers ‘because of the lack of consistent relationships between attitude and behavior’ (Phillips & Silverman, 2012, p. 325).

Conclusions

Physical education teachers can assess pupils’ attitudes and make appropriate corrections and changes to their teaching by using the above measurements tools. Researchers have another way to measure students’ attitudes toward PE and assessment in PE to help them into further research of the field.

Conflicts of interest – There are no conflicts of interest to declare.

References

- Ajzen, I. (2005). *Attitudes, Personality, and Behavior* (2nd ed.). Berkshire England: Open University Press
- Azzarito L., & Solomon A. M. (2005). A reconceptualization of physical education: The intersection of gender/race/social class. *Sport, Education and Society*, 10, 25-47.
- Barr-Anderson, D. J., Neumark-Sztainer, D., Schmitz, K. H., Ward, D. S., Conway, T. L., Pratt, C., Pate, R. R. (2008). But I like PE: Factors associated with enjoyment of physical education class in middle school girls. *Research Quarterly for Exercise and Sport*, 79, 18–27.
- Cox, A. E., Smith, A. L., & Williams, L. (2008). Change in Physical Education Motivation and Physical Activity Behavior during Middle School. *Journal of Adolescent Health* 43, 506–513.
- Davison, K. K., Werder, J. L., Trost, S. G., Baker, B. L., & Birch, L. L. (2007). Why are early maturing girls less active? Links between pubertal development, psychological well-being, and physical activity among

- girls at ages 11 and 13. *Social Science and Medicine*, 64, 2391–2404.
- Dismore, H. & Bailey, R. (2010). ‘It’s been a bit of a rocky start’: attitudes toward physical education following transition. *Physical Education and Sport Pedagogy*, 15, 175–191.
- Donovan, C. B., Mercier, K., & Phillips, S. R. (2015). Investigating Attitudes Toward Physical Education: Validation Across Two Instruments. *Measurement in Physical Education and Exercise Science*, 19, 91–98.
- Ebbeck, V. (2015). Goal orientations and intrinsic motivation for physical education: Does perceived competence matter? *Journal of Physical Education, Recreation and Dance*, 86, 53.
- El-Sherif, J.L. (2016). The Value of Fun in Physical Activity, *Strategies*, 29, 3–8.
- Erdmann, R. (1983). Motivation und Einstellung im sporttheoretische Betrachtung zweier Konstrukte. In Erdmann, R. (Hrsg.), *Motive und Einstellung im Sport*. Schorndorf: Hofmann.
- Fishbein, M., Ajzen, I. (2010). *Predicting and changing behavior: the reasoned action approach*. Psychology Press. New York: Hove.
- Hilland T., Brown T., & Fairclough S. (2017). The physical education predisposition scale: Preliminary tests of reliability and validity in Australian students. *Journal of Sports Sciences*, 1–9.
- Hiland T., Stratton G., Vinson D., & Fairclough S. (2009). The Physical Education Predisposition Scale: Preliminary development and validation. *Journal of Sports Sciences*, 27, 1555–1563.
- Ikonomopoulos, G. (2005). *Application and effectiveness of evaluation in physical education*. Unpublished doctoral dissertation, Democritus University of Thrace, Greece, GR. [In Greek.]
- Jaakkola, T., Wang, C. K. J., Soini, M., & Liukkonen J. (2015). Students’ Perceptions of Motivational Climate and Enjoyment in Finnish Physical Education: A Latent Profile Analysis. *Journal of Sports Science and Medicine*, 14, 477–483.
- Jaakkola, T., Yli-Piipari, S., Watt, A., & Liukkonen, J. (2016). Perceived physical competence towards physical activity, and motivation and enjoyment in physical education as longitudinal predictors of adolescents’ self-reported physical activity. *Journal of Science and Medicine in Sport*, 19, 750–754.
- Liu J. D., & Chung P.K. (2014). Development and Initial Validation of the Psychological Needs Satisfaction Scale in Physical Education. *Measurement in Physical Education and Exercise Science*, 18, 101–122.
- Lovelace, M., & Brickman, P. (2013). Best Practices for Measuring Students’ Attitudes toward Learning Science. *CBE—Life Sciences Education*, 12, 606–617.
- Malina, R. M., Bouchard, C., & Bar-Or, O. (2004). *Growth, maturation, and physical education*. Champaign, IL: Human Kinetics.
- Marttinen, R., Fredrick, N. R., Silverman, S. (2018). Changes in student attitude toward physical education across a unit of instruction. *Journal of Physical Education and Sport*, 18, 62 – 70.
- Murdey, I. D., Cameron, N., Biddle, S. J. H., Marshall, S. J., & Gorely, T. (2004). Pubertal development and sedentary behaviour during adolescence. *Annals of Human Biology*, 31, 75–86.
- Nicaise, V., Cogerino, G., Bois, J., Amorose, A. J. (2006). Students’ perceptions of teacher feedback and physical competence in physical education classes: Gender effects. *Journal of Teaching in Physical Education*, 25, 36–57.
- Nicaise, V., Cogerino, G., Fairclough, S. J., Bois, J., Davis, K. (2007). Teacher feedback and interactions in physical education: Effects of student gender and physical activities. *European Physical Education Review*, 13, 319–337.
- Phillips, R.S., Silverman, S. (2012). Development of an Instrument to Assess Fourth and Fifth Grade Students’ Attitudes Toward Physical Education. *Measurement in Physical Education and Exercise Science*, 16, 316–327.
- Prochaska, J., J.F. Sallis, D.J. Slymen, and T.L. McKenzie. (2003). A longitudinal study of children’s enjoyment of physical education. *Pediatric Exercise Science* 15, 170–178.
- Säfvenbom, R., Haugen, T., & Bulie, M. (2015). Attitudes toward and motivation for PE. Who collects the benefits of the subject? *Physical Education and Sport Pedagogy*, 20, 629–646.
- Shen, B., Centeio, E., Garn, A., Martin, J., Kulik, N., Somers, C., McCaughtry, N. (2016). Parental social support, perceived competence and enjoyment in school physical activity. *Journal of Sport and Health Science*, 1–7.
- Silverman, S. (2005). Low-skilled children in physical education: A model of factors that that impact their experiences and learning. In F. Carrerio da Costa, M. Cloes, & M. González (Eds.), *The art and science of teaching in physical education and sport*. Leige, Belgium: University of Leige Press.
- Singer, R., Eberspaecher, H., Boes, K., & Rehs, H. J. (1980). *Die ATPA-D Skalen*. Limpert.
- Solmon, M. A., & Lee, A. M. (1996). Research on social issues in elementary school physical education. *Elementary School Journal*, 103, 229–239.
- Subramaniam, P. R., & Silverman, S. (2000). Validation of scores from an instrument assessing student attitude toward physical education. *Measurement in Physical Education and Exercise Science*, 4, 29–43.
- Subramaniam, P. R., & S. Silverman, S. (2002). Using complimentary data: An investigation of student attitude in physical education. *Journal of Sport Pedagogy*, 8, 74–91.
- Subramaniam, P. R., & Silverman, S. (2007). Middle school students’ attitudes toward physical education.

- Teaching and Teacher Education*, 23, 602–611.
- Telford, R. M., Telford, R. D., Olive, L.S., Cochrane, T., & Davey, R. (2016). Why Are Girls Less Physically Active than Boys? Findings from the LOOK Longitudinal Study. *PLoS ONE* 11(3): e0150041.
- Thompson, A. M., Baxter-Jones, A. D., Mirwald, R. L., & Bailey, D. A. (2003). Comparison of physical activity in male and female children: Does maturation matter? *Medicine and Science in Sports and Exercise*, 35, 1684–1690.
- Vamvoukas, M. & Troulis, G. (1999). “Teachers' attitudes on the evaluation of students”. In *School exams and marks in question*, Edited by: Chiotakis, S. 201–225. Athens: Gregory.
- Wallhead, T. L., & Buckworth, J. (2004). The role of physical education in the promotion of youth physical activity. *Quest*, 56, 285–301.
- World Health Organization. (2017). Observations from the Health Behaviour in School-aged Children (HBSC) WHO collaborative cross-national study, Copenhagen, Denmark, WHO Regional Office for Europe.