

## **DEVELOPMENT OF AN INSTRUMENT TO ASSESS PERCEPTION OF QUALITY PHYSICAL EDUCATION (QPE) AMONG EUROPEAN PROFESSIONALS**

Walter HO<sup>1</sup>, Md. Dilsad AHMED<sup>2</sup>, Pedro G. CARVALHO<sup>3</sup>, Antala BRANISLAV<sup>4</sup>,  
Imre MAKSZIN<sup>5</sup>, Miguel G. VALEIRO<sup>6</sup>, Konstantin KOUGIOUMTZIS<sup>7</sup>,  
Stefania CAZZOLI<sup>8</sup>, Rudolph L. VAN NIEKERK<sup>9</sup>, Tony MORRIS<sup>10</sup>,  
Fan HUANG<sup>1</sup>, Beatriz WONG<sup>1</sup>

<sup>1</sup> Faculty of Education, University of Macau, Macau, China

<sup>2</sup> Department of Elementary Education, Faculty of Education,  
University of Alberta, Alberta, Canada

<sup>3</sup> Department of Education and PE and Sports Sciences, University Institute of Maia and  
CIDESD, Maia, Portugal

<sup>4</sup> Department of Sport Educology and Sport Humanistics, Comenius University in Bratislava,  
Bratislava, Slovakia

<sup>5</sup> Faculty of Physical Education and Sport Sciences, Semmelweis University,  
Budapest, Hungary

<sup>6</sup> Department of Physical and Sports Education, Universidad de La Coruña, Coruña, Spain

<sup>7</sup> Department of Nutrition and Sport Science, Faculty of Education,  
University of Gothenburg, Gothenburg, Sweden

<sup>8</sup> Interfaculty School of Sport Sciences, Università Degli Studi di Torino, Turin, Italy

<sup>9</sup> Department Human Movement Science, Faculty of Health Sciences,  
University of Fort Hare, Alice, Rep. of South Africa

<sup>10</sup> College of Sport and Exercise Science, Victoria University, Sydney, Australia

### **ABSTRACT**

*Developing quality physical education programmes (QPE) for school-age children is an important goal of teachers and health educators. This paper studies professionals' perceptions of QPE in Europe. In the survey, 24 items related to status and roles, educational elements and supportive features in physical education, were presented to education professionals from six selected European cities. A sample of 342 professionals participated. After an exploratory factor analysis (EFA), using Maximum Likelihood extraction and direct oblimin rotation methods, 18 of the 24 items were retained. The items were clustered under four subscales, Development and Supportive Elements for QPE in Schools, Core Value of QPE, Curriculum Arrangement of Physical Activities and Core Content Knowledge of QPE. Cronbach's alpha coefficient ( $\alpha=0.85$ ) indicated good internal consistency for the overall measure. The retained four factors from the EFA were assessed with confirmatory factor analysis (CFA). The four-factor model demonstrated a good fit with the data. It was hypothesised that all 24 items could be retained after EFA, but six items were excluded due to low factor loading. The four-factor structure had internal consistency and acceptable inter-factor correlations. The structure seemed applicable to the diversified setting for the study of QPE.*

**Keywords:** Quality PE (QPE); Perception of QPE; European perspective of QPE.

## INTRODUCTION

The importance of physical education programmes in European schools was recently highlighted in two publications of the European Commission, namely the European Guide for Healthy Physical Activity and Sport Programs (2011) and Physical Education and Sport at School in Europe (2013). Concurrently, legislative efforts have aimed to protect students' right to physical education in schools. For example, in Sweden (Swedish National Agency for Education, 2004), England (Department for Education and Employment, 1996) and the European Parliament (2012) legislation succeeded in requiring physical education to be either a key learning area in countries' curricula or an important component of general education.

Hardman (2008) indicated that the majority of countries (89% primary schools; 87% secondary schools) are legally required to present physical education in their schools. The figure rises to 95% of schools in the European region, when countries are included where there are no legal requirements for physical education, but physical education is generally practised in schools anyway. Nevertheless, a number of issues and barriers still limit the provision of effectiveness of the delivery of physical education programmes in schools.

### **Curriculum time and teaching methods for physical education**

An important aspect in the protection of children's right to exercise is reflected in the provision of curriculum time for physical education and the development of innovative teaching methods (UNESCO, 2015). In Europe, although a decision was made to establish physical education as a key learning area or compulsory subject in schools, there was no stipulation about the number of hours of curriculum time it would receive (Working Group on Sport & Health, 2008). Countries have diverse rules regarding the allocation of instructional time for physical education. According to the report of the European Commission (2011), many countries, such as Estonia, Poland, Slovakia, Finland, Iceland and Norway, including the recommended instructional time for physical education at different educational stages.

On the other hand, Sweden adopted a policy incorporating the total physical education time over the entire period of compulsory education. In German-speaking Belgium, along with Italy and Portugal, flexible instructional time was allocated to physical education at the primary school level (years 1-4). In Germany and Flemish Belgium, the Netherlands and the United Kingdom (Wales), official recommendations were made for physical education instructional time, but schools were free to allocate this time according to their particular schedules and circumstances.

Nevertheless, the decreasing amount of curriculum time and the instructional methods and activities in physical education classes have raised concerns. These concerns were discussed, for example, in the studies led by the Houses of the Oireachtas Joint Committee on Education and Science (2005), Verstratet *et al.* (2007), Kriemler *et al.* (2010), Resaland *et al.* (2011) and Harris (2013), who studied quality physical education programmes and fitness improvement in students.

### **Providing quality physical education in teaching and learning**

Another concern regarding physical education relates to the quality of learning. This issue was first introduced by Bunker and Thorpe (1982), who proposed games as a replacement for the skills model of learning, a proposal that has been highly influential in the field of instruction in physical education by generating new ideas on teaching and using games in school (Griffin & Butler, 2005). This approach was later introduced in Australia, Singapore, China, Taiwan and

the Hong Kong SAR, becoming a new trend in physical education (Webb & Pearson, 2008; Liu, 2010).

European countries have had their own diverse perspectives on teaching and learning in physical education. According to the report on Physical Education and Sport at School in Europe of the European Commission (2013), teachers in Latvia, Austria, Slovenia and Finland were encouraged to include physical activity in various school subjects, rather than limiting it to a single class. In contrast, Germany, Portugal and the United Kingdom adopted the cross-curricular approach to give students a broader perspective on sports and exercise. In yet another approach, the Czech Republic, Germany and Norway teach their students the traffic rules for pedestrians and cyclists as part of the physical education curriculum. While in Greece, the Czech Republic and Poland, physical education has emphasised the importance of familiarising young people with Olympic ideals and symbols (European Commission, 2013).

### **Facilities, infrastructure, and equipment in physical education programmes**

Support for physical education programmes, in the form of facilities, infrastructure and equipment' has also been lacking. Drewett and O'Leary (2006) found that less than half of schools in Ireland had the recommended equipment for implementing the revised physical education curriculum. In the Irish National Teachers' Organization (INTO) 2005-Survey (INTO, 2008), respondents were asked to rate the adequacy of the equipment and resources in their schools. Approximately one-third of the countries in Europe reported below average/inadequate quality of facilities and equipment. Additionally, nearly half of the countries had a limited/insufficient quantity of facilities, and two-fifths of countries had a limited/insufficient quality of equipment.

Again, 60% of countries from eastern and western Europe, reported problems with low maintenance levels at existing PE sites, and although the more economically developed European countries had higher expectations and standards for their facilities and equipment, there were still indications of inadequacies and shortages. Inadequate and/or poorly maintained facilities and equipment can affect the quality of physical education programmes detrimentally and make it difficult to implement them in the first place according to the National Association for Physical Education and Sport (NASPE, 2004). Therefore, the quality of physical education in these countries may fall short of expectations (Hardman & Marshall, 2000).

### **Study of Quality Physical Education (GPE)**

According to UNESCO (2000), quality education programmes were expected to include the development of healthy learners in education, a supportive environment, meaningful content, student centred teaching process in learning and outcomes that achieve the national goals in education and social participation. These five factors served as the ingredients and blueprint for discussions of concerns on the quality issue in education. For example, Hardman (2006) discussed the differences between countries in Europe, where the ingredients for discussion were curriculum design, the status of PE in primary and secondary schools, instructional time allocations and general practices in physical education.

Nevertheless, no attempt was made to determine the actual concerns of professionals regarding these factors. Although the title of "promise and the reality" was presented, it reflected the statistical differences, but not the perceptual understanding of these ingredients in Quality Physical Education. The study of Quality Physical Education was further discussed in a paper by McNeill *et al.* (2009). Their suggestions included international standards and

recommendations on the criteria of physical education programmes and curricula, physical education equipment and facilities, the status of physical education and teaching in physical education. The paper adopted the measuring technique of means, standard deviations and frequencies (percentages), but without a validated scale.

To our knowledge, a sound psychometrical instrument does not exist to assess the perceptions of professionals regarding QPE. The ICSP recognised that without knowing the concerns of professionals, it would be difficult to identify a proper focus for developing QPE in schools. Knowing that the perceptions of professionals would be productive, especially because they are educated, earned qualifications in the same/related fields, have an understanding of the profession and are the first to deal with the policy implemented by the government. Therefore, in 2011, the four member associations (ISCPES, IAPESGW, IFAPA and FIEP) of the International Committee of Sport Pedagogy (ICSP), which is a working group of the International Council of Sport Science and Physical Education (ICSSPE) launched a collaborative project to study the issues surrounding quality physical education programmes in Europe.

Valid and reliable measures of the perceived quality of physical education programmes are required to determine whether quality physical education is achieved in the schools of various countries. This could further provide for a comprehensive and productive programme for the involvement of students to gain from their structured physical education programmes. Consequently, the question for this research is what are the factors that underpin the perception of quality physical education of professionals in European countries?

## **PURPOSE OF STUDY**

The overarching aim of the present study is to develop a valid and reliable tool to assess perceptions of quality physical education of professionals in school settings. A secondary aim is to explore the perceptions of physical education professionals on the quality and agenda of physical education.

Defining QPE from an ecological perspective serves as the working definition for this study. It is defined as a planned, progressive, inclusive learning experience that forms part of the curriculum in early years, primary and secondary education. In this respect, QPE acts as the foundation for lifelong engagement in physical activity and sport. The learning experience offered to children and young people through physical education should be developmentally appropriate to help them acquire the psychomotor skills, cognitive understanding, and social and emotional skills they need to lead a physically active life (UNESCO, 2015).

## **METHODOLOGY**

A scale was developed as a strategy for data collection. Physical education teachers and sport professionals from schools, universities, government agencies and non-government sport organisations (such as club coaches and sports management officials) were invited to participate in the study. A sample of 342 professionals (Male=197, 57.6%); Female=145, 42.4%) from six European cities participated in this study (Table 1).

The project was supported by funding from the University of Macau. A survey was conducted in 2013. After ethics approval was granted by the University of Macau (first author's institution), the Principal Investigator (PI) discussed the methodology and purposes of the study with co-authors and colleagues from Europe. Thereafter, the co-authors proposed the research

to their own university and receive permission from all other universities/schools/institutions in their city to collect data from the identified professionals.

**Table 1. PARTICIPANTS IN QPE SURVEY**

Country	City	Primary School PE Teacher	Secondary School PE Teacher	Teacher in Universities	Total
Greece:	Athens	12	8	23	43
Portugal:	Lisbon	18	18	30	66
Hungary:	Budapest	22	28	44	94
Italy:	Torino	0	3	33	36
Slovakia:	Bratislava	24	20	7	51
Spain:	La Coruna	17	4	31	52

TOTAL: 342

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The data collection included information sheets for participants, a consent form and the questionnaires. The PI phoned and emailed all possible contacts in Europe to invite them to participate. The PI also discussed the project in detail with professionals during conferences prior to data collection. Participants were asked to return the questionnaires directly to the researchers within four weeks by either using the envelopes provided by the research team or by personally giving them to the researcher in their own city.

### **Item generation and instrument development**

An instrument, the Professional Perceptions toward Quality Physical Education (PPTQPE), was developed for this study based on the reviewed literature of Keating and Silverman (2004), Guan *et al.* (2005), Subramaniam and Silverman (2007), Arar Rigbi (2009) and Song and Chen (2012) and verified using a content validity procedure suggested by Lynn (1986). Existing instruments were not considered because they tend to be constructed within a particular cultural environment and setting, which could create idiosyncratic problems due to the formulation of items relating to that particular culture (Poortinga, 1989).

To develop the scale, the research group used references from the Quality Physical Education Guidelines of the National Association for Sport and Physical Education (NASPE, 2004), the UNESCO (2015) report on Quality Physical Education, the ICSSPE (2012) International Position Statement on Physical Education and the preliminary works of ICSP (2010/2012) on the development of International Benchmarks for Physical Education Systems. The content validity of the scale (PPTQPE) in this study was established to ascertain that all important aspects were covered and identified, and to exclude items undesirable to a particular

construct domain (Straub *et al.*, 2004). The two-stage process for content validity of Lynn (1986) was adopted. The two-stage process included a developmental and judgement stage.

### ***Developmental Stage***

The first stage focused on defining PPTQPE, generating content domains in each component, and developing an item pool for each domain. Two methods were employed to generate content domains and relevant items. The first method requires pooling relevant items from previous studies on the topic and then generating new items. The second method begins by gathering items and domains from target respondents. The advantage of employing both methods to generate content domains and the items in each domain is that it ensures that all relevant items and possible content domains are taken into consideration at the beginning of the instrument development (Keating & Silverman, 2004).

Because the items were descriptive statements, the authors reviewed the items in the literature extensively and then related them to the context of their own country. This process resulted in the initial sub-scales proposed, namely the status of physical education, the physical education curriculum in school, physical education teachers and their qualifications, the infrastructure required for running physical education, teaching in physical education, the benefits of physical education and the current challenges for physical education. Items from the literature reviews were then generated to enable the assessment of each of the seven content domains. The authors identified 24 items regarding PPTQPE in Europe. The items generated were also examined in terms of their clarity and readability. Twenty-four items were agreed upon by the researchers, and the items recommended by the authors represented content validity.

As a secondary process, six volunteer students from the University of Macau (who were familiar with the concept of quality physical education in school settings) were asked to ascertain whether the items generated by the authors in each statement were sufficiently clear and relevant to describe PPTQPE, to verify whether important aspects or domains had been omitted, or whether a statement should be excluded from the existing items. The six students included one PhD student, two final-year master's students (last year of college), two sophomores (second year of college), and one freshman (first year of college). Three of them studied physical education, and three were in the field of social science. According to their recommendations, one statement was added, two were revised and one was omitted. Hence, 24 items were maintained.

### ***Judgement Stage***

The judgement stage focused on item validity and domain validity. Three external experts (physical education professors other than the authors) from other universities and the six aforementioned student participants were invited to participate in this judging process. The three professionals were invited to determine face validity and to indicate whether the scale provided an appropriate description regarding the study purpose and content area. The team also evaluated the scale in terms of feasibility, readability, consistency of style, formatting, clarity of the language used and domain validity. The adoption of these procedures was introduced by Haladyna (1999), Trochim (2001) and DeVon *et al.* (2007).

A quantitative sorting process was conducted to examine whether the statements fit with the instrument in assessing PPTQPE and whether the statements were in line with the seven corresponding dimensions. Participants were asked to indicate on a 3-point scale with 1=No, 2=Maybe, and 3=Yes, whether the statement should be included and, secondly, how confident

they were about the inclusion of an item (1=Not very sure, 2=Sure, and 3=Very sure). A minimum of two of the three judges had to agree that a statement belonged to the instrument (where 3=Yes), and the mean confidence score had to be greater than 2.0 (where 2>Sure). The judges were also asked to associate each of the 24 items with one of the seven factors and to indicate how confident they were that their selection was related to the particular content domain.

The rating scales and criteria for domain validity were the same as the item validity criteria. As a result, two items were revised, and one of the items was moved to a different content domain. Hence, 24 items were kept in the instrument and classified into the seven original factors. The six volunteer students were then invited to verify item validity and domain validity based on the experts' classification. The same procedures and regulations were adopted. As a result, no modifications were required for any item.

The PPTQPE scale comprises of two sections. The first section has 24 items regarding PPTQPE, and participants are asked to indicate how strongly they agree with each statement related to quality physical education in schools in their respective European country. They respond on a 6-point, positively-packed, agreement-rating scale. This response scale includes two negative and four positive agreement responses with identical scores (Strongly Disagree=1; Mostly Disagree=2; Slightly Disagree=3; Moderately Agree=4; Mostly Agree=5; and Strongly Agree=6). Positively-packed rating scales are known to generate discrimination in the context of social desirability (Lam & Klockars, 1982; DeVellis, 2003; Brown, 2004; Song & Chen, 2012). The second section comprises the personal demographic information of the participants. In the present study, the PPTQPE scale was administered to participants in six European cities as previously described.

### **Analysis of data**

The response rate of the participants was very high (99.54%) with only a small portion of the participants' responses having missing data (0.46%). This procedure followed the description suggested by Dempster *et al.* (1977) on missing values at 5%. The data were verified and deemed acceptable for further analysis. Both statistical and empirical techniques were used to select the items. A total of 24 items were subjected to descriptive and frequency analysis.

Using SPSS 20, the research team examined the data quality in terms of its frequency distribution and item discrimination. Exploratory factor analysis (EFA) with maximum likelihood extraction and direct Oblimin rotation was adopted to examine the structure of Quality Physical Education and to define a set of factors that accounted for the common variance among items. These items were then evaluated by their loading on each factor. The second phase of analysis was conducted to confirm the different subscales and the structure of the 24 items. Reliability analysis (Cronbach's alpha) was performed to examine the contribution of each item to its respective factor. When items were deemed to be statistically equivalent, the authors were asked to determine which items to retain and place under appropriate categories to reflect their close conceptual meaning.

Further, Confirmatory Factor Analysis (CFA) using AMOS 21.00 (IBM) was conducted to examine the retained four-factor structure from exploratory factor analysis. The overall model fit was evaluated using multiple goodness-of-fit indexes including the Chi-square value, Comparative Fit Index (CFI), Bentler-Bonett Normed Fit Index (NFI), Parsimony comparative fit index (PCFI), the Root Mean Square Error of Approximation (RMSEA) accompanied by its 90% confidence interval (90% CI). Although much debate surrounds the selection of precise

thresholds of fit, especially relevant within the field of theory-based multi-item/factor CFA testing (Marsh *et al.*, 2004), it is commonly accepted that thresholds of  $>0.90$ , close to or less than 0.08 (Bentler, 1995), and up to 0.08 (Bollen, 1989; Browne & Cudeck, 1993) for the CFI and RMSEA are indicative of acceptable model fit.

## RESULTS

Table 2 presents the 24 questions with the mean and standard deviation scores of each item.

**Table 2. DESCRIPTIVE STATISTICS AND ITEM-WISE DATA DESCRIPTION**

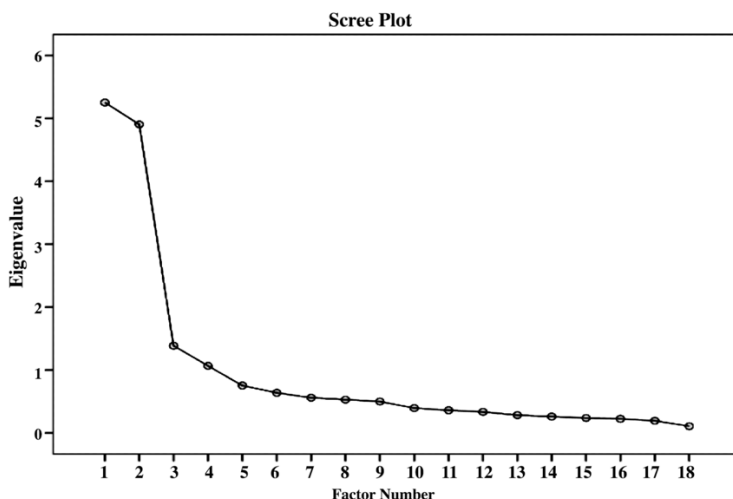
Items description	Mean±SD
1. Physical Education is the most effective means of equipping children with the skills, attitudes, values, knowledge.	5.43±0.804
2. Physical Education should be accessible to all children, whatever their ability/disability, sex, age, culture, race/ethnicity, religious, social or economic background.	5.90±0.449
3. Physical education should be a compulsory subject in school for all children.	5.89±0.477
4. The school should have safe and suitable equipment for physical education lessons.	5.84±0.488
5. The school should have safe and suitable facilities for physical education lesson.	5.79±0.598
6. The School should have safe and suitable environment for physical education lessons.	5.75±0.640
7. The Teacher should be qualified to teach physical education.	5.85±0.544
8. Different types of physical activities and associated knowledge should form the content through which young people learn.	5.38±0.873
9. Health knowledge should be regarded as one of the major areas of learning.	5.19±0.995
10. Positive sport related attitudes and values should form a major focus in learning.	5.43±0.807
11. The teaching and learning of physical education should be fun and enjoyable.	5.53±0.775
12. Students should be given opportunities for active learning in physical education lesson	5.64±0.690
13. Extension physical activity opportunities after-school or extra-curricular/co-curricular activities are essential components in helping students to extend their learning experiences in sport and physical activities.	5.42±0.803
14. Physical education is a compulsory subject in schools	5.26±1.180
15. All schools have safe and suitable equipment for physical education lessons.	3.11±1.140
16. All schools have safe and suitable facilities for physical education lessons.	3.01±1.190
17. All schools have safe and suitable environment for physical education lessons.	3.09±1.190
18. All teachers are qualified to teach physical education.	4.09±1.260
19. Different types of physical activities and associated knowledge form the major content in learning.	4.25±1.260
20. Health knowledge is regarded as the major content in learning.	3.43±1.310
21. Positive sport related attitudes and values are taught and form the major content in learning.	3.92±1.220
22. The teaching and learning of physical education is fun and enjoyable.	4.28±1.050
23. Students are given opportunities for active learning in physical education lessons.	4.26±1.170
24. Extension physical activity opportunities, after-school or extra-curricular / co-curricular activities are available to all students to extend their learning experiences in sport and physical activities.	3.74±1.270



### Preliminary analysis

The major concern of the present study was to identify and explore a possible framework for the study of quality physical education and subsequently to determine a structure for its analysis. To achieve the primary purpose of the study, that is, to define a set of factors that would account for quality physical education, the results of an EFA with a maximum likelihood extraction with direct oblimin rotation are presented. To determine the number of factors, several criteria were used, including the differences between adjacent eigenvalues, a scree plot (Figure 1) and differences in the percentage of variance accounted for.

The purpose was to account for the adjacent factors and, more importantly, to take into consideration the factor structure. A solution with four factors (subscales) was considered to depict the data most aptly. The scree plot is presented in Figure 1. Factor one was called “Development of Supportive Elements for Quality Physical Education in School (DSEQPE)”; Factor 2 was called “Core Value of Quality Physical Education (CVQPE)”; Factor 3 was called “Curriculum Arrangement of Physical Activities (CAPA)”; and Factor 4 was called “Core Content Knowledge of Quality Physical Education (CCKQPE)”. These factors had eigenvalues of 5.25, 4.91, 1.39 and 1.07, respectively, explaining 62.05% of the variance.



**Figure 1. SCREE PLOT FOR FACTOR ANALYSIS**

It seems that European professionals perceived the core values (such as safety and accessibility) as most important in the development of quality physical education because this factor has the highest mean ( $35.03 \pm 7.07$ ). Secondly, they perceived Curriculum Arrangements ( $23.88 \pm 32.57$ ) to be highly important to quality physical education, followed by Core Content Knowledge ( $16.02 \pm 4.72$ ). They perceived Development and Supportive Elements for Quality Physical Education ( $9.22 \pm 11.08$ ), with the lowest factor mean, reflecting all schools had safe and suitable environments, facilities and equipment for physical education lessons.

The internal consistency (Cronbach's alpha coefficient) for the four subscales was calculated. Based on the item statistics, three items from the first factor, six items from the second factor, six items from the third factor and three items from the fourth factor were selected and retained due to their good internal consistency (Table 3). Out of the 24 items, six

with low factor loadings were excluded from the analysis. Thus, the original set of 24 items was reduced to 18 items, which are listed in Table 3 for reference.

**Table 3. FACTOR LOADINGS OF PATTERN MATRIX AND COMMUNALITIES (H2) OF 24 ITEMS AFTER EXPLORATORY FACTOR ANALYSIS (cont.)**

	Factors and items	Mean±SD	Component				h2
			1	2	3	4	
<i>Development and supportive elements for Quality Physical Education in school (DSEQPE)</i>							
16	All schools have safe and suitable facilities for physical education lessons	3.01±1.190	0.983				0.946
15	All schools have safe and suitable equipment for physical education lessons	3.11±1.140	0.846				0.805
17	All schools have safe and suitable environment for physical education lessons	3.09±1.190	0.821				0.766
<i>Core value of Quality Physical Education (CVQPE)</i>							
4	The school should have safe and suitable equipment for physical education lessons	5.84±0.488		0.806			0.602
5	The school should have safe and suitable facilities for physical education lesson	5.79±0.598		0.788			0.723
2	Physical Education should be accessible to all children, whatever their ability/disability, sex, age, culture, race/ethnicity, religious, social or economic background.	5.90±0.449		0.787			0.618
3	Physical education should be a compulsory subject in school for all children	5.89±0.477		0.773			0.542
6	The School should have safe and suitable environment for physical education lessons	5.75±0.640		0.758			0.679
7	The Teacher should be qualified to teach physical education	5.85±0.544		0.734			0.630
<i>Curriculum arrangement of physical activities (CAPA)</i>							
21	Positive sport related attitudes and values are taught and form the major content in learning	3.92±1.220			0.864		0.748
23	Students are given opportunities for active learning in physical education lessons	4.26±1.170			0.761		0.535
22	The teaching and learning of physical education is fun and enjoyable	4.28±1.050			0.740		0.519
19	Different types of physical activities and associated knowledge form the major content in learning	4.25±1.260			0.714		0.556
20	Health knowledge is regarded as the major content in learning	3.43±1.310			0.601		0.521
24	Extension physical activity opportunities, after-school or extra-curricular / co-curricular activities are available to all students to extend their learning experiences in sport and physical activities	3.74±1.270			0.503		0.437

*Continued*

**Table 3. FACTOR LOADINGS OF PATTERN MATRIX AND COMMUNALITIES (H2) OF 24 ITEMS RETAINED AFTER EXPLORATORY FACTOR ANALYSIS (cont.)**

	Factors and items	Mean±SD	Component				h2
			1	2	3	4	
<i>Core content knowledge of Quality Physical Education (CCKQPE)</i>							
9	Health knowledge should be regarded as one of the major areas of learning	5.19±0.995				0.788	0.553
8	Different types of physical activities and associated knowledge should form the content through which young people learn	5.38±0.873				0.627	0.499
10	Positive sport related attitudes and values should form a major focus on learning	5.43±0.807				0.601	0.490

### Underlying structure of the Quality Physical Education and School Sports Programme (QPE)

The results of the factor analysis indicated that the 18 items listed in the final version of the scale demonstrated sound and good inter-correlation results, as evidenced by the high value (0.872) of the Kaiser-Meyer-Olkin Measure of Sampling Adequacy (MSA) and Bartlett's test of sphericity, which was significant. MSA is an index used to quantify the degree of inter-correlation among items and the appropriateness of the factor analysis. A calculated value above 0.50 for either the entire matrix or an individual variable indicates the appropriateness of acceptance (Field, 2000). The results of the factor analysis are presented in Tables 3 and 4.

As indicated in Table 3, all items with factor loadings higher than 0.50 were retained. When the pattern matrix (factor and structure matrix were considered because of cross-loading) was considered, it seemed that the four subscales should be retained to reflect the conceptual framework. These four basic subscales were DSEQPE, CVQPE, CAPA and CCKQPE.

**Table 4. INTERNAL CONSISTENCY OF PERCEPTION OF QUALITY PHYSICAL EDUCATION (QPE)**

Factor	1	2	3	4	Cronbach's $\alpha$	Mean	Variance	SD	No. of Items
1	1.00	-0.070	0.619	-0.085	0.932	9.22	11.08	3.32	3
2	–	1.00	0.062	0.543	0.904	35.03	7.07	2.65	6
3	–	–	1.00	0.133	0.868	23.88	32.57	5.70	6
4	–	–	–	1.00	0.736	16.02	4.72	2.17	3

Factor 1: Development and Supportive Elements for Quality Physical Education in School (DSEQPE)

Factor 2: Core Value of Quality Physical Education (CVQPE),

Factor 3: Curriculum Arrangement of Physical Activities (CAPA)

Factor 4: Core Content Knowledge of Quality Physical Education (CCKQPE)

The internal consistency reliability coefficients (Cronbach's  $\alpha$ ) for each subscale were computed. The  $\alpha$ s for the four factors ranged from 0.736 to 0.932, with a mean of 0.736 (Table 4). As Table 4 shows, Cronbach's alpha coefficient was 0.932 for the DSEQPE scale

and 0.904 for the CVQPE. For the subscale of CAPA, it was 0.878 and for CCKQPE, it was 0.736. These values indicated that the items were consistent within each factor and the factors were consistent within the model to permit meaningful further analysis.

The inter-correlations between the four major practices were moderate, ranging from -0.070–0.619, with an average of 0.13, which indicated that the concepts were relatively independent of each other. The four factors (DSEQPE CAPA, CVQPE, and CCKQPE) related to quality physical education were strongly correlated. Descriptive results regarding factor mean scores were calculated. In general, professionals reported the most positive attitudes towards CVQPE ( $5.83\pm 0.539$ ), followed by CCKQPE ( $5.33\pm 1.26$ ) and CAPA ( $3.98\pm 0.904$ ). The lowest mean was observed in DSEQPE albeit still positive, ( $3.07\pm 1.18$ ) (Table 1).

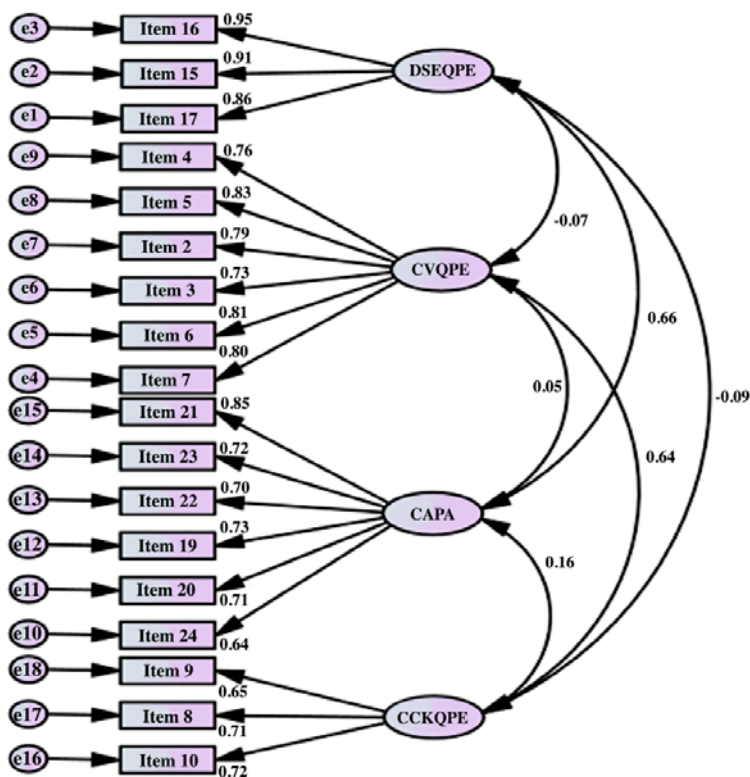


Figure 2. MEASUREMENT MODEL FOR QPE

In order to check the retained factors' item loading, a measurement model (Figure 2) was evaluated using multiple goodness-of-fit indices, including Chi-square value, CFI, NFI, PCFI, RMSEA accompanied by its 90% confidence intervals (90% CI). The results of the robust CFA, using the maximum likelihood estimation method (Table 5), suggest that the four-factor model provided an adequate fit to the data.

**Table 5. MODEL FIT INDICES FOR DATA COLLECTED USING QPE**

Indices	Model Ho
Sample size (N)	342
Chi-Square value ( $\chi^2$ )	370.554
Minimum Discrepancy (CMIN)	370.554
Degrees of Freedom (DF)	129
Comparative Fit Index (CMIN/DF)	2.873
Comparative Fit Index (CFI)	0.933
Normed Fit Index (NFI)	0.902
Parsimony Comparative Fit Index (PCFI)	0.704
Root Mean Square Error of Approximation (RMSEA)	0.074

## DISCUSSION

The objective of this study was to develop a scale to identify the perceptions of quality physical education of professionals from various European countries. The findings in this study indicated a model of the perception of Quality Physical Education of professionals, which was conceptually and empirically developed within four sub-scales. From the 24 items, 18 were retained and six were excluded because of low factor loadings. The findings in this study indicate that the perceptions of the professionals centred strongly on the four factors of Core Value of Quality Physical Education, followed by Core Content Knowledge of Quality Physical Education and Curriculum Arrangement of Physical Activities. They lastly endorsed the factor of Development of Supportive Elements for Quality Physical Education in School.

The *Core Value of Quality Physical Education (CVQPE)* sub-scale in the model indicated the prerequisites of a structured curriculum in physical education, safe and suitable equipment, facilities and an environment for the development of quality physical education lessons. Professions expressed the view that the principle of free physical education should be upheld for all children, irrespective of their ability/disability, sex, age, culture, race/ethnicity, and religious, social or economic background. Thus, they considered that physical education should be a compulsory subject in school for all children, and the teacher should be qualified to teach physical education. The core value subscale had a mean score and SD of  $5.83 \pm 0.539$  and high reliability ( $\alpha = 0.932$ ).

With regard to the status of Quality Physical Education, this finding is supported by comments from the National Association of Sport and Physical Education (NASPE) in the 2004 Standards for Physical Education. Fun in activities, environment building, opportunities in activities, a good arrangement for a sport-related curriculum, content knowledge, instruction and assessment were identified as major ingredients for quality physical education (NASPE, 2004). Whitehead (2001) also discussed this factor in her study of physical literacy. Culpan (2005) considered this factor to be a significant part of the development of individuals, while Mottet and Beebe (2006) indicated the importance of this factor in assisting the development of the affective domain in physical education. Regarding the compulsory status of physical education in school, this observation was supported by Van Wersch *et al.* (1992) and Omar-Fauzee *et al.* (2009), who discussed the contributing effects of physical education as a

compulsory subject. Students agreed that physical education should be in the curriculum because of its importance as a stepping stone to become active in physical activities (Omar-Fauzee *et al.*, 2009).

The second concern was related to the subscale, *Core Content Knowledge of Quality Physical Education* (CCKQPE). The core content knowledge subscale also had good reliability. This subscale is associated with knowledge in health, learning content and positive sport-related attitudes and values. In connection to this finding, the report on Steps to Health (2007) emphasised health, diet and obesity as a global problem of the highest priority. Health education standards and performance indicators for physical education are considered to represent essential knowledge and skills for healthy individuals. They serve to promote educational values and the goals of tolerance, understanding, excellence and good health (Ontario Curriculum, 2000; ACARA, 2012). In addition, throughout the entire process, children's active participation in physical education classes is of utmost importance to meet the required goal. Therefore, to sustain learning, positive sport-related attitudes, values and motivation levels (Rikard & Banville, 2006) play a major role in being active.

The *Curriculum Arrangement of Physical Activities* (CAPA) domain was perceived to have the lowest priority in the overall observation. The subscales *Core Value* and *Core Content Knowledge* had similar mean scores and SDs, but greater fluctuation was observed in Curriculum Arrangement and Supportive Elements. These results might indicate the perception that physical education professionals, who participated in this study, considered the curriculum arrangement components to be important to quality physical education, but there was uncertainty among them. Although the subscale was best described as an inevitable essentiality (Department for Education, 2011) due to its significant role in the development of learning motives, goal achievement and habit development through participation in sport and physical activity, inconsistent perception was recorded among professionals.

In conjunction with the discussion, a challenge was observed regarding the efficiency of physical activity in developing talent, passion and creativity and discouraging the possible development of the habit of active participation and quality in learning (Larson, 2000). With regard to the status of quality physical education, this finding is supported by Rink (2013) and Ward (2013). Their discussion highlighted the necessity and essential characteristics that contribute to active learning by students. Davis *et al.*, (2008) argued that the focus should not be on what teachers did, but how students responded, and in this entire process, teaching, learning and standards-based content were inextricably linked to enjoyable participation in physical education. In this process, the focus should be on effective teaching, the instructional behaviours of teachers, the availability of time in learning and support for curricular innovation. To solve the problem of inactivity, an alternative approach was needed to be applied in the work of afterschool programmes (Jago & Baranowski, 2004; Trost *et al.*, 2008).

The responses of the professionals to the subscale *Development of Supportive Elements for Quality Physical Education* suggested that those who participated in this study perceived the development of supportive elements the third most important aspect in quality physical education. The perspectives of the participants differed from those of professional's studies by Hardman and Marshall (2009), who cited the problems of inadequate facilities and poor maintenance at different teaching sites in their paper. This concern was also reflected in the discussion of Drewett and O'Leary (2006) concerning the development of sport and physical education in Irish schools. Drewett and O'Leary (2006) found that equipment was adequate for the revised physical education curriculum in less than half of the schools they studied. The Irish National Teachers' Organization reported the organisation's survey in 2007 at the Conference

on Education about the inadequacy of physical education equipment and resources in schools. Those reports indicated that the adequacy (quality and quantity) of equipment is closely related to the socio-economic circumstances of a region.

Nevertheless, the quality issue on infrastructure building was not the primary concern in the review of quality physical education by nations. That review stresses the concern that facilities, venue setting and use of equipment are important markers of the image of the profession. Further discussion was suggested to determine when professionals were accustomed to the poor facilities, that it would lead to the adoption of negativity towards the environment and thus, reduce sensitivity towards improvement of quality physical education. Negative perceptions should be avoided in order to motivate physical education professionals to stay in their jobs with hope and prospect.

In addition, results from the CFA on the 18 QPE items revealed a desirable goodness-of-fit between the proposed 4-factor model and the data collected from this substantial sample of participants in diverse types of PE in the context of large cities in Europe. Furthermore, the high, unmediated effects of the latent variables on the observed variables indicated that the items are actually measuring what they have been assigned to measure. Hence, the results reported here suggest that the hypothesised model in the current study fitted the data well, lending support to the initial validity of the QPE. It can be claimed that the present results support the applicability of this scale as a measure of a wide range of Quality Physical Education characteristics among professionals in diverse PE contexts.

## CONCLUSIONS

This study presented the properties that are associated with the validity and reliability of a scale measuring the perceptions of professionals of quality physical education. It further identified the factors these professionals regarded to be important in the provision of quality physical education programmes in schools. The QPE can be used as an instrument to determine the perceptions professionals have of PE and its status in their countries and development of the profession. In addition, the QPE would be suitable for research and applied work conducted around the world. Cronbach's alpha coefficients indicated good internal consistency for the overall measure, as well as the retained sub-factors. It had a good fit with the data, based on CFA of the 4-factor model. However, the research team hypothesised that all 24 items could be retained after EFA, but 6 items were excluded because of low factor loadings. The reason for these low loadings was not clear, but might have been related to the high achievement levels of the development of physical education programmes in European countries.

## RECOMMENDATION

Enhancing the quality of the teaching of physical education and student learning experiences is a complex matter that requires the involvement of a range of development. With reference to the subscales, the core value and content knowledge were of greatest concern. The curriculum ranked third, and the supportive element ranked last. If this sequence indicated the priority of work, the core value and content knowledge and supportive development on sport environment, facilities and equipment should be given highest priority in work for improving quality development of physical education. This observation focuses attention on the question of provision of suitable environments for work and efficiency in attaining the target. Nevertheless, this observation requires further verification due to the lack of comparative data.

This study was conducted in only six European cities, and no cities in France, Germany, Sweden, Finland, Austria or Denmark were included. Due to the limited sample size, the observation cannot be applied or generalised as a common phenomenon for quality physical education in Europe. Nevertheless, the study highlights concerns about and ways to construct quality physical education in schools and responses to improve upon the current variability of levels of quality.

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**Corresponding author:** Dr. Walter Ho; **Email:** walterdilsad@gmail.com

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