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# CEREPS summit in Prague with the topic “Quality Criteria and outcome standards for Physical Education and School Sport”

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CEREPS (Conseil européen des recherches en éducation physique et sportive) is a non-governmental and non-commercial organisation, that was founded in Luxembourg in the autumn 2015. The vision and purpose of this research council is to serve as a communication base and open consortium for advanced studies in cross-border collaboration of different national and regional institutes of sport sciences across Europe and for mainly EU-based associations and federations which focus on physical education, youth sport and other physical activities to enhance an active lifestyle for children and adolescents.

The council aspires to include important stakeholders of different institutes, associations and societies to enhance collaborative partnerships across borders of each institute, association or society which focus on research for a holistic well-balanced individual development of body, will and mind for young people. CEREPS wants to become a major address for research applications and exchange of research items of PESS on inter-institutional and inter-cultural level of their members and for different partner bodies on a common EU level.

CEREPS sets up a website with a detailed menu of research-based items. CEREPS sets up working groups: research & application committee, teaching & coaching committee, and a grant & sponsorship committee. CEREPS select members and appoint honorary members as special advisers for the committees. CEREPS has a General Secretary who will network between the three committees and with external partner organizations. CEREPS builds partnerships in research consortiums with international/EU based umbrella organisations.

CEREPS organizes in regular intervals meetings/ conferences/ symposia on selected research topics and other common items of interest with a comparable EU-based view. CEREPS offers their expertise for satellite/invited seminars/symposia for their partner organisations (e.g. EUPEA, ENGSO Youth, FIEP Europe, HEPA Europe et al.). CEREPS publish final reports of research studies, separately and in conjunction with partners. CEREPS will attract the EC-Commission and EACEA to become a collabo-

rative research partner for quality PE and grass-root sports development for children and adolescence. CEREPS work as an EU-based service point and centre of higher learning institutes across Europe to support the future development and exchange of research and expertise in PE, HEPA, and youth sports studies.

There exist no research consortium of PESS cross-culturally or cross borderline in the EU. Many national and EU-based bodies of PESS do not have a research consortium. EU-based application policies of EACEA are more demanding strategic and collaborative partnerships between EU-stakeholders in PESS & grass-root youth sport. Promotion of PESS (quality & quantity) on national and EU-level needs evidence-based research results to raise funding and more awareness for better support of PESS in the near future through policy-makers.

Networking and partnerships on local, regional, national and EU-level are progressing for applied PESS for various reasons (time allotment for daily PA, bio-psycho-social benefits, personnel, material and financial resources) which means a challenge for researchers in PESS. Legitimation and justification of PESS must be better linked with research outcome of teaching to achieve a holistic, balanced well-being approach of development for pupils' current and future needs. Threats for PESS on different levels and in different settings of delivery are visible across the EU.

The first CEREPS summit took part in Luxemburg 2016, the second in Brussels 2017, the third in Lisboa 2018, the fourth in Prague 2019 and the fifth will be organised in Budapest 2020. The main topic in Prague 2019, organized at Charles University through Faculty of Physical Education and Sport in Carolinum, was "Quality Criteria and outcome standards for Physical Education and School Sport". 14 European countries took part at this event, there presented 17 active experts and attend other 7 passive participants. Subthemes were: Health behaviour (habits, attitudes ...), Motor development (skills, abilities ...), Knowledge of physical culture (rules, history, successes, equipment, warm up ...), Psycho-social qualities (well-being, self-concept, motivation, cooperation ...). We offer to the reader of *Acta Universitatis Carolinae Kinanthropologica* some selected contributions from CEREPS conference in Prague in this volume.

# Monitoring of physical education and other standards of a Whole Active School Approach and assessment of learning outcomes: a PE teacher and PE student pilot study of the EuPEO project in Germany

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## ABSTRACT

This study of assessment of learning outcomes in physical education classes including a “Whole Active School Approach” (WASA) is a part of the Erasmus+ EuPEO project in Germany. 19 German PE teachers at  $n = 13$  different secondary schools (rural area = 63.2%), cross 5 German countries with their  $n = 388$  PE students (average age: 15.2 years; girls: 59.4%) were asked about their assessment of learning outcomes in PE teaching domains and the implementation of a WASA as a part of a questionnaire (European School Questionnaire (ESQ) for teachers and European Pupils Questionnaire (EPQ)). There is a clear ranking profile in the view of pupils about their assessment by PE teachers: the highest assessed criteria are social aspects like team work, respect and social relations with other class mates (85%), followed by physical competences with health-related fitness, motor skills and sport techniques (76%). In the ranking levels of achievements the motor domain ranked only in 4th position. Some teaching domains (social and behavioural purposes) seem to be of more importance in the view of teachers and their students than physical and motor development. Extra-curricular school sport is offered by more than 80% of the schools, but range of participation of pupils is low with around 32% assessed by teachers and up to 42% assessed by their pupils. Some other divergences in the view of teachers and pupils exist for the implementation of physical activities in recess (teachers 74%; pupils almost 60%) and after-school programmes (teachers about 53%, pupils about 23%). Data are discussed and divergences in assessment are explained in this study. Finally, a WASA to support daily physical activities does exist but really needs further support in school life.

## KEYWORDS

Germany; PE teachers; PE students; learning outcome assessment; whole active school approach

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## BACKGROUND

There exist some different reviews about the state of the art of PE on international level. Some scholars and research consortia (Pühse & Gerber, 2005; Bailey, 2006; Klein & Hardman, 2008; Onofre et al., 2012a, b; Popovic et al., 2018; Naul & Scheuer, 2020) monitored PE development likewise some international PE umbrella organizations did: ICSSPE's "World-wide Reviews" (Hardman & Marshall, 2000, 2009); the UNESCO-NWCPEA Survey (2013) and the follow up of UNESCO's "Quality Physical Education Manual" for policy makers (2015). Special interest and support of advocacy was given to the development of school-based physical education in Europe also by institutions of the European Union (CDDC, CoE: Hardman, 2002, 2007; EACEA/Eurydice, 2013; EU-Expert Group, 2015; Kornbeck, 2019). Results show up to five different domains in teaching PE at school, but without identical terminology. Characterising and conceptualising these educational domains in PE, there is a European consensus visible of at least three essential domains: physical-motor domain, psycho-social domain and mental-cognitive domain (Scheuer & Naul, 2018).

However, all these and some other reviews and recommendations on the subject of PE did include data collection mainly of experts in PE at higher learning institutes and less on grass roots level of Head School Teachers, School Sport Coordinators, licenced PE teachers, parents or PE pupils. Such a "grass root PE study" is the Erasmus+ project "EuPEO = European Physical Education Observatory" (January 2018 up to December 2020).

### The EuPEO-Study

The EuPEO-project was initiated by the Portuguese lead partner, the Faculty of Human Movement Studies (FMH) at the University of Lisbon (Onofre et al., 2018) and includes 11 partners from 8 countries (Portugal, Ireland, Germany, France, Switzerland, Czech Republic, Hungary, and Slovenia). The EuPEO-project is divided into three parts: (1) review of previously applied instruments and construction of a Country (ECQ), School (ESQ) and Pupils Questionnaire (EPQ) applied in a pilot A; (2) evaluation of the pilot A, fine tuning of the questionnaires for the two main instruments of the study, the "Manual of External Assessment" (MEA) of PE settings and the "Toolkit for Internal Monitoring" (TIM) of PE settings at school, again applied in a pilot B; (3) outcome of pilot B, preparation of the final version of the MEA and TIM instruments including dissemination to future multipliers in the 8 countries.

This paper will report on the German ESQ and EPQ studies (2018/19) with selected components and items of the *curriculum flexibility dimension* of each study in pilot A.

### The European School and Pupils Questionnaire (ESQ & EPQ)

As a part of the first working package of the Erasmus+ project EUPEO, a European School Questionnaire (ESQ) and a European Pupils Questionnaire (EPQ) were compiled by participating members of the project. An English version of both instruments was translated into German language by the authors of this paper. Before application of data collection, the German version of the questionnaires were piloted by PE teach-



ers and PE students for meaning and understanding, both groups were not located at the same school.

The ESQ and EPQ were structured into *dimensions*. Each dimension was *subdivided into components* and each single component includes concrete *indicators for analysis and assessment* of teachers and pupils.

For instance: the ESQ is structured into six dimensions (1. character of the school context; 2. curriculum flexibility; 3. teacher workforce; 4. teacher training; 5. community partnerships and 6. facilities, equipment and resources. Consequently, e.g. dimension No. 6 has three components (6.1 facilities, 6.2 equipment, 6.3 resources). The facility component 6.1 includes four indicators: adequacy, facilities' PE curricular flexibility, access to facilities, safety and health.

The EPQ includes *three dimensions* (curriculum flexibility, material & resources and community partnerships). The dimension of curriculum flexibility was structured into *three components* (1. physical education, 2. school sports, 3. other forms of physical activity). *The component of physical education comprises five indicators*: 1.1 contents, 1.2 assessment and grading, 1.3 learning outcomes, 1.4 field trips, 1.5 pedagogical principles.

This paper will address selected results of the ESQ (n = 13 PE teachers) and EPQ (n = 388 PE pupils) of the pilot study A at secondary schools in Germany. The results are restricted to the dimension of *curriculum flexibility* and their components with indicators of ESQ and EPQ.

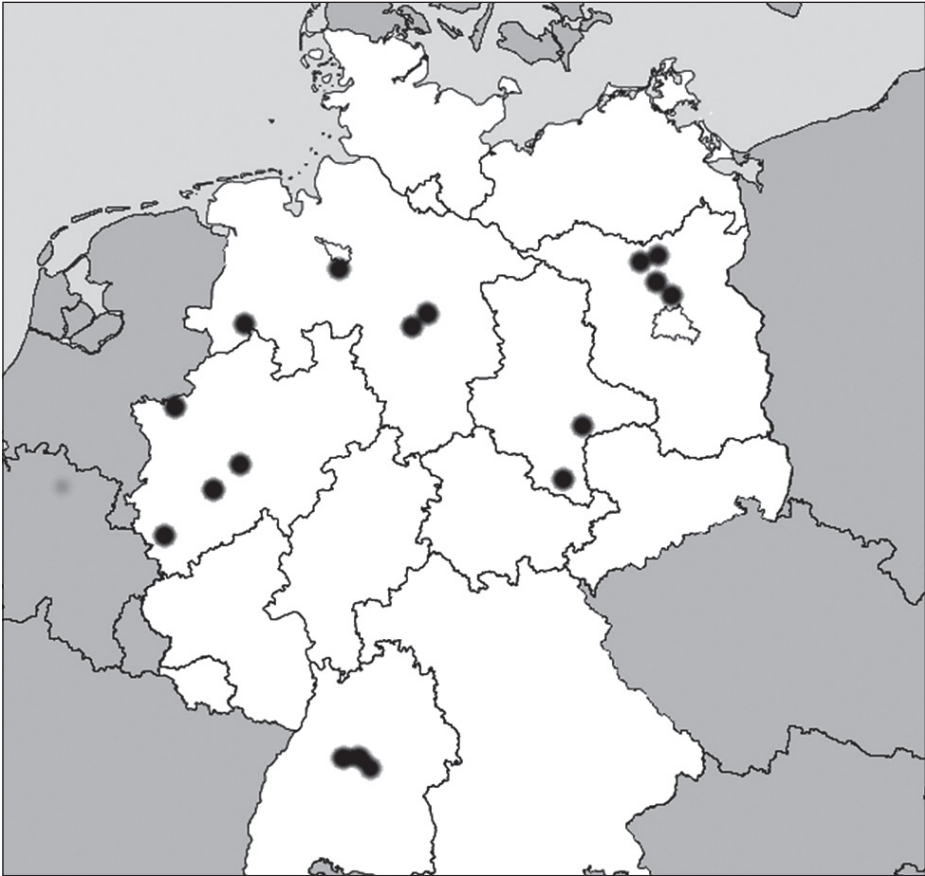
Teachers were asked about five sub-categories which are part of a WASA (Scheuer & Naul, 2018). These *components* are: Assessment criteria in PE and school sports (1) with expected and ranked learning outcome of pupils, participation in extra-curricular physical activities of pupils (2) at school; active learning of pupils in other school subjects (3), physical activities in recess time (between school lessons) of pupils (4), offer & participation of pupils in PA after-school programmes and (5) active transportation of pupils to school. Data and results of this pilot study are pooled according to these five sub-categories of a WASA.

Data were collected between May and June 2018 for the ESQ and between January and April 2019 in case of the EPQ, both at the same schools. The data were assessed using SPSS 24.

## Sample

After language control of the German issues of ESQ and EPQ with some revisions, ESQ was sent to n = 19 different head teachers/expert teachers of PE to collect data of PE at their school (13 secondary schools, 6 primary schools) on the six different components of the ESQ.

As figure 1 shows, the schools are located in five different German states (Brandenburg [Gransee, Löwenberg, Neuruppin, Stechlin], Baden-Württemberg [Filderstadt, Remshalden, Stuttgart, Waiblingen], Lower Saxony [Fürstenau, Hannover, Langenhagen, Weyhe], North-Rhine Westphalia [Bocholt, Langerwehe, Solingen] and Saxony-Anhalt [Sandersdorf-Brehna, Naumburg]).



**Figure 1** Location of elementary and secondary schools (ESQ and EPQ, pilot A)

500 copies of the EPQ were posted for delivery to the head teachers/PE experts at the 13 secondary schools for data collection in grades 9 and 10 at their schools. Eleven of these 13 secondary schools finally participated in the EPQ data analysis, while two schools in Lower Saxony were not able to participate anymore.

The 13 secondary schools involved in the pilot study cover six different types of the German Länder school system (rural area = 63.2%), running from Middle School up to Upper Secondary Schools; the German Comprehensive School (5) was the most included type of school. Besides the 13 PE teachers  $n = 388$  PE pupils (average age: 15.2 years; girls: 59.4%) of final grades of the schools participated in the survey. Most of the pupils ( $n = 198$ ) attended the German Grammar School (see Table 1). The size of schools varied between 142 students (primary school) and 1.500 students (Comprehensive/Grammar School).

Table 1 Type of secondary schools and sample sizes of teachers and pupils

Type of School	No. of schools ESQ	No. of pupils EPQ
Middle School	1	65
Comprehensive School	5	71
Grammar School	4	198
Lower Secondary School	1	28
Community School	1	–
Upper Secondary School	2	26

### 1. Results of physical education content areas and assessment of grading and learning outcome

German secondary schools provide a strong games profile for their pupils in grade 9 and 10. Athletics (73.7%) are far more given than gymnastics (51.3%). Each second school of the sample offers fundamental movement skills and dance. Physical and sport-related knowledge and personal and social competences are targeted as indicators for PE in one out of three schools (see Figure 2).

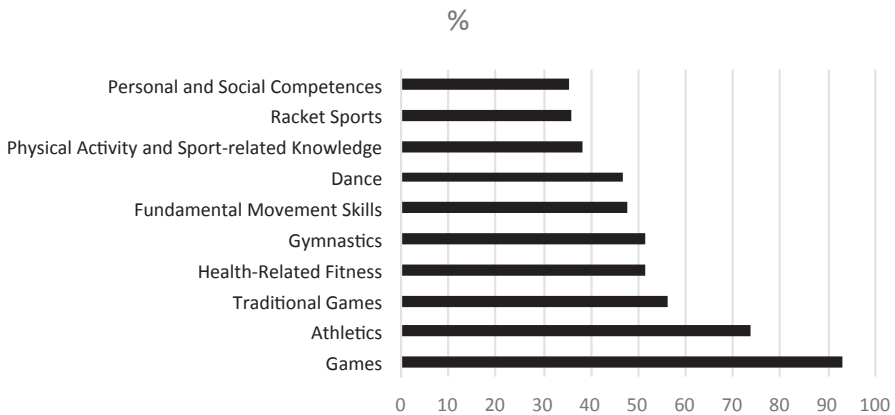


Figure 2 Contents taught in the last compulsory school year in German secondary schools (EPQ n = 388)

Approx. 80% of the teachers agreed to apply school-based assessment criteria for grading and learning outcome of their pupils as a summative evaluation in their PE classes; almost half of them do also formative evaluation. The PE department at school is responsible for that, also to pass results to parents. Both, teachers and pupils agreed up to 50% (each second school of study) that pupils are allowed to participate in identifying criteria of assessment, more than 30% of teachers said 'No'. For the authors of this paper it is striking that only 5% of teachers apply screenings of their pupils' development in PE at the start of the school year (all results are shown in Table 2).

**Table 2** Assessment criteria items of PE in % (ESQ n = 19; EPQ n = 388)

	PE Teachers	PE Students
Criteria given at school	78.9	not asked (n.a.)
Kind of criteria (if there are criteria)		n.a.
Summative evaluation	78.9	n.a.
Formative evaluation	42.1	n.a.
Screening at start of school year	5.3	n.a.
PE department responsible	78.9	n.a.
Student participation given	yes: 47.4 no: 31.6	49.5
Parents feedback information	78.9	100

**Table 3** Pupils' PE assessments of learning outcome and personal achievements (EPQ n = 388)

	Valid %	Mean Likert Scale
Learning outcomes assessed on a state level		Personal achievements (Mean; 3-point Likert Scale)
Social aspects (positive relations, team work, respect)	85	2.4
Psychological aspects (self-esteem, body image)	28	1.9
Physical aspects (skills, techniques, health related fitness)	76	2.3
Cognitive aspects (understandings, memory)	17.2	2.0
Kind of assessment		Student agreement with assessment (Mean; 5-point Likert-Scale)
Norm tables	71.8	3.3
Individual progression	53.4	3.9
Comparisons to other students	43.6	3.3

Learning outcome assessment in PE is related to a framework on regional state level in German secondary schools. There is a clear ranking profile in the view of pupils about their assessment by PE teachers: the highest assessed criteria are social aspects like team work, respect and social relations with other class mates (85%), followed by physical competences with health-related fitness, motor skills and sport techniques (76%). Self-esteem, body image and other individual psychological aspect in PE is ranked with 28%, followed by only 17% of cognitive items as a learning outcome (see Table 3).

As Table 3 also shows, there exist three different yardsticks for outcome measurements: physical performance levels written in norm tables are the most frequently used tool for outcome and learning assessment in the view of pupils (approx. 72%) followed by 53% which are related with the individual progression rate of a pupil which

is often compared and assessed to the development of other pupils in the respective class (43%).

Pupils were further asked in how far their learning outcome aspects were achieved and in how far they agree with the three different yardsticks of their learning outcome assessments by teachers. A three point (learning outcome) and five point (agreement on yardsticks) Likert-Scale was given for personal assessment. All different aspects of learning outcome in PE were achieved (mean = 1.5): the social and physical aspects scored highest (2.4 and 2.3). The most preferred yardstick of assessment was the individual progression assessment (3.9). No yardstick was disagreed on (mean = 2.5), but norm tables (3.3) were much lower agreed by pupils compared with the most frequently used tool of PE teachers (see Table 3).

A more precise comparison about the different domains of achievement in learning outcome of PE and personal importance of the domains in the view of pupils are given in Figure 3 and 4.

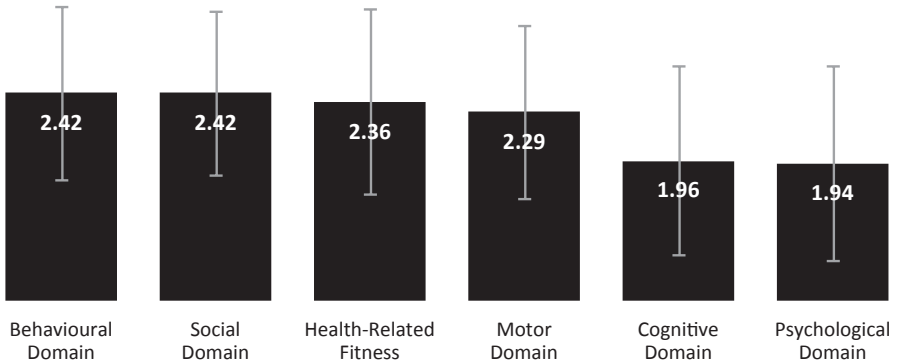


Figure 3 Ranking level of achievements of learning outcomes in PE

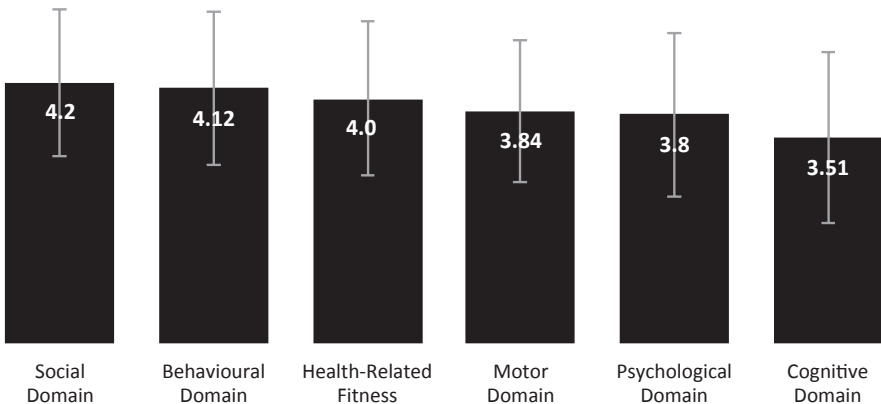


Figure 4 Ranking level of personal importance of learning outcome in PE

The behavioural and social domains ranked highest ( $2.42 \pm 0.6$  each) but only slightly before the health-related fitness ( $2.36 \pm 0.6$ ) and motor domain ( $2.29 \pm 0.6$ ) (see Figure 3).

Almost identical to the learning outcome ranking the pupils also assessed their personal importance of the different learning domains in PE except one item: the social domain and behavioural domain changed its former ranking positions; the social domain ( $4.2 \pm 0.9$ ) has slightly become of more personal importance than the behavioural domain ( $4.12 \pm 0.9$ ). It is somewhat striking that the motor domain in PE ranked only fourth position in both assessments and that two educational domains seems to be better achieved and of more relevance for the pupils than the motor and health related fitness domain in the subject of PE.

## 2. Results of Whole Active School Approach

Beside curricular PE lessons at school, there are some more curricular, extra-curricular and co-curricular components which are part of the so-called “Whole Active School Approach” (WASA). Table 4 documents the range and status of implementation at our pilot schools in the view of PE teachers and their PE students.

**Table 4** WASA assessed in % by PE teachers (n = 19) and their students (n = 388)

	Curricular	Curricular	Extra-Curricular	Extra-Curricular	Extra-curricular	Co-curricular
	Regular Physical Education	Active Learning in other subjects	School Sports	Physical Activity in Recess	After-school PA Programs	Active Commuting to school
Physical Education Teachers	100	78.9	Offer: 84.2 Participation: 31.6	73.7	52.6	36.8
Physical Education Pupils	100	30.2	42.0	59.0	22.7	30.4

All values = % (including missing values)

Teachers and pupils, both groups agreed about regular PE lessons in all types of their secondary schools (100%). However, active learning in other school subjects is quite differently assessed: up to almost 80% of PE teachers agree about implementation of active learning in other school subjects; their students only agree up to 30%. This discrepancy can be explained by the fact that PE teachers teach PE also in lower 5th and 6th grades, whereas the PE pupils are 9th and 10th graders. In higher grades active learning with movements in academic subjects is really rare and very often pupils in their age of 14 to 16 years did not experience active learning when they attended primary school classes some years before. Extra-curricular school sport is offered by more than 80% of the schools, but range of participation of pupils is low with around 32% assessed by teachers and up to 42% by their pupils. These data of low participation

**Table 5** Participation in School Sports assessed by PE teachers (n = 19)

Participation and Costs	Data %
Participation rate overall	15–20% by 21% of teachers 30% by another 21.1%
Participation of different groups	
Girls	10.5%
Special need groups	10.5%
Low SES groups	10.5%
Immigrants	5.3%
Extra fees to pay	42.1% not at all; 42.1% yes, for special offers

All values = % (including missing values)

range in extra-curricular school sport really coincide with other German school sport studies in the last 20 years (Spengler et al., 2016; Naul et al., 2020). Some other divergences in the view of teachers and pupils exist for implementation of physical activities in recess (teachers 74%; pupils almost 60%) and after-school programmes (teachers about 53%, pupils about 23%). The explanation is: not all pupils, particularly girls in their age of 14 to 16 years, really like physical activities to exercise in recess time; other participation data of pupils’ engagement in after-school sport programmes reveal that only half of the pupils or even less really attend all-day schools with sport after-school programmes (Neuber et al., 2015; Kuritz et al., 2016). Finally, new co-curricular offers with active commuting to school are on development in Germany. Almost one out of three schools in this study offers “walking bus”, “save biking” etc. for their pupils.

Data of participation of pupils in school sports document in our pilot well known results of previous German studies (Spengler et al., 2016). The results in Table 5 show an ambivalent picture between secondary schools: some schools (here about 20%) report an average participation rates of over 30%, whereas another approx. 20% of schools only report on 15 up to 20% of pupils who participate in school-based school sport offers. In the ages of 14 to 16 years, girls, adolescents with special needs, children from low SES groups and particularly immigrants participate on a low (about 10%) and very low level (5%) in extra-curricular school sports.

**Table 6** Participation in School Sport assessed by PE Pupils (n = 388)

Physical Education Students	Participation	No. of activities		Time			
	Yes			Times per week		Minutes per week	
	%	mean ± SD	Min/Max	mean ± SD	Min/Max	mean ± SD	Min/Max
Secondary School	42.0	2.55 ± 2.57	0/13	1.36 ± 1.01	0/7	116.87 ± 106.7	0/600

Some more precise data about extra-curricular school sports are reported by PE pupils, as shown in Table 6: in their view 42% are involved in extra-curricular school sport activities. However, the ambivalences already documented by their PE teachers are also visible here: there are secondary schools without any physical activities (0) in extra-curricular school sports and minimums of times and minutes of school sports per week are zero! On the other side means of activities, times and minutes per week ranges between 2.5 different physical activities, 1.36 times and about 117 minutes. But also some sport minded schools are a part of our pilot sample which offers up to 13 different physical activities, seven times a week and with a maximum of 600 minutes.

## DISCUSSION

Caution is needed to interpret data of this first EuPEO pilot study (A) as very typical results about teaching, monitoring and assessment outcomes of PE in German secondary schools. However, some results do really coincide with previous surveys, some do not. Other data of items e.g. for the WASA cannot be compared, because they are unique and have never been collected as a set of items before and can give only a first insight.

Across the five different German countries involved in this pilot study of assessment criteria in PE, school-based criteria seem to be the most spread, mainly for summative assessment and less for formative assessment. Only half of the sample of PE teachers agreed that their pupils can participate in identifying assessment criteria. Assessment criteria do either not exist or are not applied to screen the development of pupils at the beginning of a school year which underpins the lower importance of formative evaluation in PE.

For PE teachers and for their pupils learning outcome of PE is ranked highest for social and behavioural aspects; lowest for cognitive aspects. For the authors of this study it is striking that even pupils ranked the motor/fitness domains in PE not in the premier level. This result contradicts previous results of the so-called “DSB Sprint Study” (2006, p. 121). In the Sprint-study students of comparable age groups ranked physical fitness and the motor domain as their premier domain in physical education and behavioural domain only in fourth position. The pupils in this EuPEO-study seem to be more in line with assessment criteria of their PE teachers and controversy to their counterparts almost 15 years ago in the Sprint study. PE teachers in this study ranked applied norm tables of motor and physical performances as the most relevant format of assessment in PE which application is merely confirmed by their students. However, these students would prefer instead of norm tables measurements of their individual progress of development during a term or a semester. But almost without screening at the start of the term or semester by PE teachers (only 5% do), this type of measurement is impossible to apply.

PE students ranked learning outcome of the social and behavioural domain in physical education teaching at the most dominant one but also as the most important one in their personal perspective. There seems to be no contradiction about the rankings of PE domains between teaching in the subject of PE and about the pupils' assessed importance of individual outcome in PE. Whether this is a new trend of priority of



domains and conformity in PE learning and outcome on which teachers and students both groups agree, cannot finally be decided and needs further studies. But definitely adolescents of today view their subject of PE differently with other priorities and learning outcomes to achieve than their counterparts of the 2000s did.

The WASA seems to be implemented in German secondary schools, but on a small level which still needs to be improved. Active learning in other subjects is more restricted to lower grades (primary schools) than to higher grades in secondary schools. Physical activities in recess must be improved at schools if a daily load of health enhanced physical activities should be achieved (60 minutes). The low percentages of students who attend sport courses as after-school offers (approx. 23%) is linked with the type and amount of schools and pupils which represent the German Grammar School (Gymnasium: 4 teachers, 198 pupils) where open all-day schools are less implemented compared to other types of secondary schools. Typical ambivalences between schools exist for extra-curricular school sport regardless of the type of the school. There exists a typical gap between normal schools, sport-friendly schools and really sport-minded schools in our sample. Too many PE students do not attend school sports which lowers the outcome for achieving an active lifestyle.

## CONCLUSION

Results of the ESQ and EPQ Study (pilot A) here are only findings of a small pilot study which must be approved and confirmed by further investigations like pilot B of the EUP-PEO-project. Some data underpin almost identical assessments between PE teachers and their PE students but also indicate some differences in application of tools to monitor and to assess learning outcomes of PE. A WASA for different physical activities does exist but really needs further support particularly by implementation of open all-day schools on secondary school level which can support the extension of active breaks in recess and other co-curricular efforts e.g. active commuting to school.

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# Dimensions and Categories for a Physical Activity Label for Schools in Europe: a Pilot Study in Luxembourg

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## ABSTRACT

In the frame of the European Physical Activity Label for Schools (Eu-PALS, 2020a) project diverse indicators of physical activity, physical education and sport in different European schools have been analysed. As a starting point, this paper is presenting the chosen indicators and comparing them to an already existing physical activity label for schools in Luxembourg. The choice of the quality criteria in the Eu-PALS project, which may lead to the awarding of the label, are further discussed by demonstrating the results of a pilot study at four schools in Luxembourg. This national pilot study shows not only to the participating schools in which areas they might need to improve their activities, but allows also more generally to evaluate the indicators and possibly to improve the choice. Finally, with regard to the topic of the CEREPS Conference 2019 in Prague – “Quality criteria and outcome standards for Physical Education and School Sport” – in the frame of which this study has been presented, it is also discussed whether the project contributes to make criteria and outcome standards of physical education and school sport in Europe visible and comparable.

## KEYWORDS

active school; physical education; school sport; Luxembourg

## DOI

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## INTRODUCTION

Cross-nationally no doubt exists that health and fitness enhancing physical activities should take place in schools. As kids spend regularly and increasingly time in school settings, it constitutes an important area to practice physical activities (Stanton Ward & Ford, 2012). Uncertainties circulate however when it comes to the concrete implementation, especially in primary schools where the person giving physical education classes has not necessarily the educational background of a physical education teacher. Therefore, teachers and school principals, but also parents and pupils, might ask themselves whether their school can be considered as highly active in terms of physical activity related programs and practices? Also, they might like to know how physically active their school is in comparison to others in their own country and/or in other European countries?

To diminish those uncertainties, indicators for a physical activity label for schools in Europe are in the centre of an ERASMUS+-funded project called “European Physical Activity Label for Schools (Eu-PALS)”<sup>1</sup> (Eu-PALS, 2020a). In the frame of this project, indicators of physical activity, physical education and school sport in different European schools are chosen and analysed. The aim is to develop a comprehensive, ready to use tool for schools to evaluate and promote the three pillars, and possibly to build up an international network of active schools. The establishment of the label shall thus allow the schools to fully utilize possibilities to provide space, time and opportunities for pupils to be physically active and to have the chance to compare and evaluate their physical activity related programs and practices to schools in other European countries. With the help of an objective comparison and evaluation tool the map of physical activity in European schools will be drawn up. Creating and developing a European network under one label allows engaging schools and children around the continent to be more active. Schools that are seeking for recognition and reward will be motivated to be awarded during the evaluation in the label system, which shall result in better and more sport and physical activity programs. The objective of the project will be reached therefore through the contribution to increased participation of pupils in physical activity programs in European Union member states. The European physical activity label focuses on three different dimensions and involves indicators from three neighbouring fields (hereinafter also referred to as “dimensions”) (Eu-PALS, 2020b):

1. quality physical education as a compulsory school subject (seen as an educational course and part of the curriculum, from the quality PE perspective) → *Physical Education (PE)*
2. health-enhancing physical activity opportunities (beyond physical education, extracurricular, organised in or by the schools or pupils themselves) → *Physical Activity (PA)*

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<sup>1</sup> Project partners are the Hungarian School Sport Federation (Hungary), the University of Ljubljana (Slovenia), the Estonian School Sport Federation (Estonia), the Youth Sports Trust (UK), the University of Luxembourg (Luxembourg), the European Physical Education Association (EUPEA; Switzerland), and the International Sport and Culture Association (ISCA; Denmark).

3. school sport dimension as an extracurricular and competitive (or non-competitive) opportunity of sport activities and events in or between schools → *School Sport (ScS)*

**Table 1** Overview of the Eu-PALS dimensions and categories

1. Physical Education (PE)	2. Physical Activity (PA)	3. School Sport (ScS)
Curriculum	School development – Physically Active School concept	Extracurricular organized sport activities (competitive or non-competitive school sport)
Teacher education and workforce	Active recess (and active homework)	Sport events (sport days, physical activity project days, sport festivals)
Facilities, equipment and resources	Active transport	
Inclusion and diversity	Curricular activities (active classroom, cross-disciplinary classes, outdoor classes)	
Community partnerships	Human resources Facilities, equipment and resources Inclusion and diversity Community partnerships	

Among those three dimensions, again different categories exist in order to comprehensively include diverse possible criteria that schools could fulfil or work on in the future. Those categories are based on the categories used in the Erasmus+ funded project European Physical Education Observatory (EuPEO) (EuPEO, 2020).

During the project, an online self-assessment tool will be developed to be able to measure the above indicators and to guide schools to comply with the label criteria (Moving Schools Award, 2020). In line with the above, the programme aims to raise awareness towards the values and qualities of sport-minded schools.

## PHYSICAL ACTIVITY LABELS IN LUXEMBOURG

### The existing label “Clever Move”

In Luxembourg a label called “Clever Move” has already been established by the SCRIPT (Service de Coordination de la Recherche et de l’Innovation pédagogiques et technologiques), a department in the Ministry of Education (SCRIPT, 2020a). The main goal of this campaign is to provide additional daily physical activity time of 15-20 minutes for pupils during instruction time, by implementing one or more of the following activities during classroom lessons in other subjects than physical education: active learning, time for relaxation and loosening, dynamic sitting, active areas in the classroom, active breaks, active home work.

To receive the label, a school must adhere to the following (SCRIPT, 2020b):

- 3/4 of the teachers commit to daily 20 minutes of exercise in the classroom;
- The school guarantees each child his/her right to PA time, esp. the PE lessons foreseen in the national curriculum;

- Once a trimester, a teacher concertation meeting is dedicated to the topic of a “physically active school”.

The assessment is provided by a self-evaluation questionnaire of the school. The network of participating schools is open for all primary and secondary schools in Luxembourg. However, until now only one secondary school has participated. Also, the sustainability of the program is questioned, as there is no strong follow-up assured by the Ministry of Education.

### **The European Physical Activity Label – what is new for Luxembourgish schools?**

The European Physical Activity Label for Schools shall ensure that ...

- the Physical Activity Label is awarded on the base of a broader sum of criteria and thereby gives schools more ideas how to improve the situation;
- secondary schools are likewise included in the project;
- a follow-up shall be provided by the project partners.

The fact that in Luxembourg a quality mark system exists means that some schools are already experienced in implementing a physical activity quality label. By applying for the more comprehensive Eu-PALS, those schools can reach out for a next, higher level when it comes to the promotion of physical activity in the frame of school development.

## **RESULTS OF THE PILOT SURVEY AT SCHOOLS IN LUXEMBOURG**

The Eu-PALS-Project embraces two different stages: Phase 1 outlines all the essential readiness factors in each of the dimensions that are necessary for a school to have in place in order to be able to progress to phase 2 and make a full application. This stage is implemented in the form of an online self-assessment. Phase 2 is the full application process for schools to join the label. This stage is based on a larger list of indicators and evaluated by the project partners. Both phases were evaluated in a pilot survey that was conducted among different schools in Europe in May and June 2019. The aim was to collect a broad feedback before the online application opens.

In the pilot study in Luxembourg four schools, two secondary and two primary schools<sup>2</sup>, participated. It was implemented in the form of a written questionnaire and should encourage the schools to provide feedback to the questionnaire, to identify possible intervention areas to enhance their approach to the three dimensions, and to reflect on the practices and attitudes of the schools towards PA, PE and School Sport. Figure 1 summarizes the answers of the four participating schools to the questions of phase 1.

First, it has to be stated that currently none of the schools fulfils all necessary criteria to pass phase 1. The secondary school ALR shows overall the best result: it fulfils the criteria in two dimensions but still needs to improve its results in the dimension “physical activity”. Also, the LESC reaches 100% in the dimension of “physical education”, so that both secondary schools pass phase 1 in this category. Among the primary

<sup>2</sup> Primary schools: École Primaire Albert Wingert, Schifflange (EF Albert Wingert); École Primaire Cecile Ries, Mersch (EF MERSch); Secondary schools: Atert Lycée, Rédange (ALR); Lycée Edward Steichen, Clervaux (LESC).

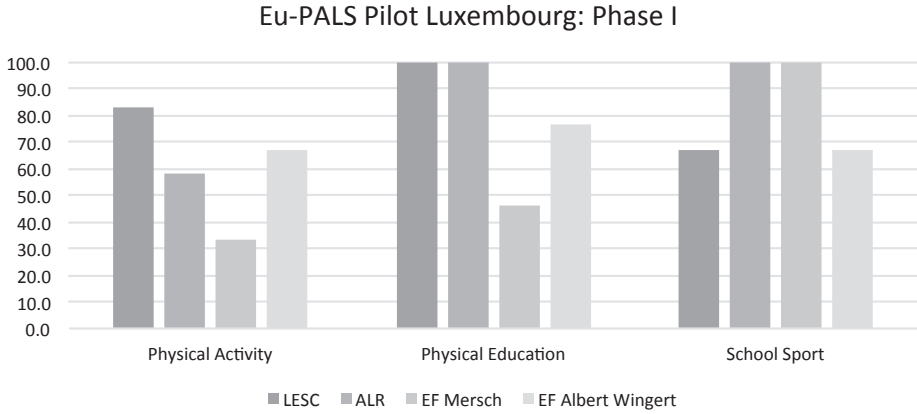


Figure 1 Results of the pilot study in Luxembourg: Dimensions Phase I

schools only EF Mersch fulfils the criteria in one field, in the dimension of “school sport”. Figure 1 demonstrates that among the three dimensions the initiatives concerning “school sport” are the ones that are in average implemented most frequently, closely followed by those in the field of “physical education”.

However, when having a look at all different schools it becomes obvious that the two primary schools have comparatively met less criteria within the dimension “physical education” than the secondary schools. The dimension “school sport” is in contrast equally important in the chosen primary and secondary schools. Especially in the primary school EF Mersch “school sport” is a strong dimension in contrast to physical activity and physical education. The two latter come out with the lowest results in EF Mersch or the highest possibility for improvement among the four participating schools.

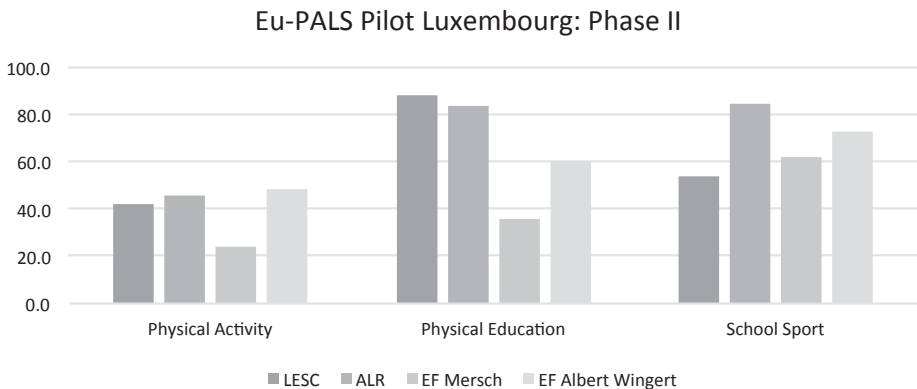


Figure 2 Results of the pilot study in Luxembourg: Dimensions Phase II

Figure 2 summarizes the responses of the four participating schools to the questions of phase 2. First of all, parallels to phase 1 can be figured out: as phase 1 constitutes the basis for reaching phase 2, it is not surprising that also here in all schools there is still room for improvement (none of them reaches 100%). The figure shows that among the three dimensions also here the initiatives concerning “school sport” are the ones that are in average implemented most frequently, again closely followed by “physical education”. In accordance with phase 1, and therefore not surprisingly, the primary school of EF Mersch demonstrates the lowest results in all categories except “school sport”, and therefore offers the highest demand for improvement in “physical education” and “physical activity”.

When comparing the results between secondary and primary schools, the dominance of the activities of the secondary schools in the field of “physical education” is once more underlined. In the dimension “physical activity” all schools have still room to improve their profile, meaning their basis to receive the label. This concerns for instance items like the “school development concept”, or the offer of “active recess” or “active transport”.

In the frame of the questionnaire the teachers were additionally asked to value the relevance addressed to the indicators in the respective dimensions and categories. In the following, the focus will be on the results concerning phase 2, as they are based on a more comprehensive spectrum of indicators and thereby allow especially relevant feedback to the composition of items. When evaluating the indicators, the respondents could choose between the three options “essential, desirable, and irrelevant” (cp. Figures 3, 4, 5).

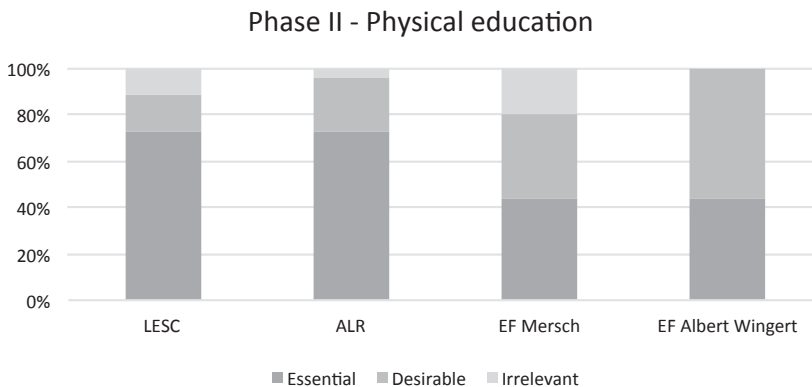


Figure 3 Results of the pilot study in Luxembourg: Relevance of the indicators in Phase II – Physical Education

Concerning the dimension “physical education” (cp. Figure 3), none of the four schools considers all chosen items as “essential”. Whereas the two secondary schools categorize around 70% of the items as “essential”, the primary schools only deem less than half of them as “essential”. The primary school EF Albert Wingert states that a majority of the criteria is after all “desirable” for the dimension; the three other schools also valued some items as “irrelevant”. This is of course an important informa-



tion for the project partners in order to further develop the final catalogue of questions to assess the indicators.

Among the items that are considered as “irrelevant” by several schools are most of all those who address the cooperation with other people or institutions, so for instance with professional associations, corporate partners and also parents.

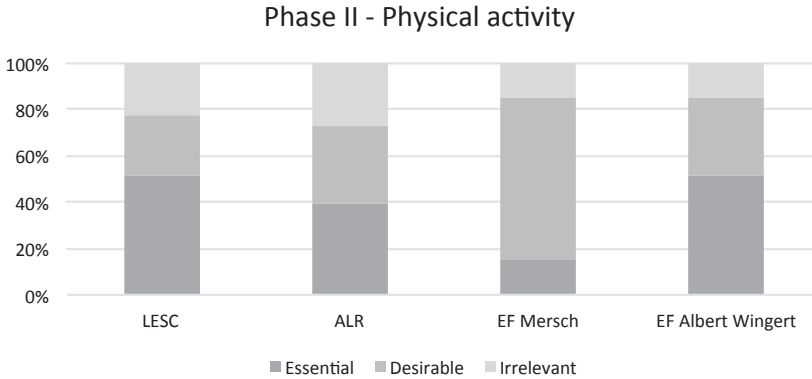


Figure 4 Results of the pilot study in Luxembourg: Relevance of the indicators in Phase II – Physical Activity

With regard to the dimension “physical activity” (cp. Figure 4), all four schools deem one part of the criteria as “irrelevant”. The ALR moreover considers only one third of the items as “essential” to mirror the physical activity status of a school. The primary school EF Mersch evaluates even only around 15% of the items as “essential”.

As for the dimension of “physical activity”, the two secondary schools value for instance the question whether teachers give active homework on a regular base (at least once a week) as “irrelevant”. The same schools also consider the implementation of regular active cross-curricular classes as “irrelevant”, arguing for instance that the national curricula do not give enough room for that (LESC). The LESC and EF

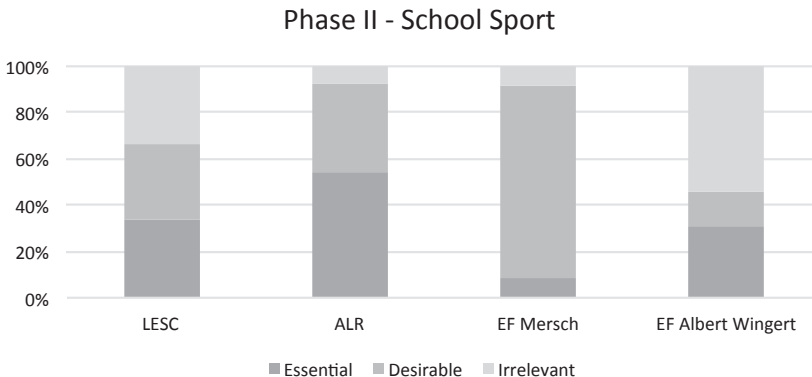


Figure 5 Results of the pilot study in Luxembourg: Relevance of the indicators in Phase II – School Sport

Mersch furthermore doubt the importance to implement regular active outdoor classes (learning spaces, forest) as a criterion for “physical activity”. Again, the cooperation with professional associations, with corporate partners and even with other schools (EF Mersch) or with higher education and research institutes (EF Albert Wingert) are partly valued as “irrelevant” for the dimension “physical activity”.

Finally, figure 5 demonstrates the relevance dedicated to the items for the dimension “school sport”. For the first time, one school, the primary school EF Albert Wingert, categorizes more than half of the items as “irrelevant”; the LESC comes to the same conclusion for one third of the items. Only the ALR ranks still around half of the items as “essential”. Among those items considered as “irrelevant” is for instance the question whether student volunteers are involved in the sport days or physical activity project days or festivals or the question whether teachers are supporting the volunteers involved in those events (both LESC and EF Albert Wingert). One school (EF Albert Wingert) mentions that this situation has so far not yet happened and that this is the reason why they do not see the relevance of this item.

## CONCLUSIONS

The results of the pilot study in Luxembourg show that the four selected schools still need to improve in order to be able to pass the necessary criteria of phase 1 of the label. Thus, none of them currently fulfils the essential readiness factors in all three dimensions (“physical education”, “physical activity”, “school sport”) that are necessary for a school to have in place in order to be able to progress to phase 2 and make a full application. With regard to the secondary schools, the dimension “physical education” shows comparatively the best results; in primary schools, the initiatives concerning “school sport” are the ones that are implemented most frequently. However, only one primary school reaches the required 100% in this dimension.

This trend is followed in phase 2, the actual application of the label, as none of the participating schools reaches 100% in any dimension. When comparing the results between secondary and primary schools, the dominance of the initiatives of the secondary schools in the field of “physical education” is once more underlined. In contrast, all participating schools have still room to improve in the dimension “physical activity”: this could for instance embrace a “school development concept”, or the offer of “active recess” or “active transport” which seems to have been neglected so far.

Concerning the value addressed to the indicators in the respective dimensions and categories, the results of the pilot study give diverse hints to further develop the final catalogue of indicators. Most critical are the comments with regard to the categories mentioned within the dimensions “school sport” and “physical activity”. It will be important to compare the results in detail to those of further pilot studies in other participating countries in Europe.

Finally, coming back to the topic of the CEREPS Conference 2019 in Prague – “Quality criteria and outcome standards for Physical Education and School Sport” –, the “European Physical Activity Label for Schools” project indeed contributes to make criteria and outcome standards of physical education and school sport in Europe visible and comparable. It also further motivates the schools to improve their curricular and extracurricular activities and school development policies. The presented results

from Luxembourg therefore constitute an important part to ensure the quality of the chosen essential categories and items and therefore for the further development of the European Physical Activity Label for Schools.

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# SLOfit surveillance system of somatic and motor development of children and adolescents: Upgrading the Slovenian Sports Educational Chart

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## ABSTRACT

Slovenia is a pioneer in the systematic monitoring of physical fitness in children and adolescents. In 1969, a national system for monitoring physical and somatic development, called the Sports Educational Chart, was developed and later revised in 1987. Since 1987, all Slovenian primary and secondary schools complete three anthropometric and eight physical fitness measures to assess child development on the population level. The results are processed by the Faculty of Sport, University of Ljubljana, Laboratory of Physical and Motor Development. The Laboratory provides feedback to every schoolchild, class and school. In recent years, advanced IT support was upgraded and renamed as the SLOfit system. Registered users of SLOfit, consist of PE teachers, parents, children, and physicians, who are able to use the on-line application My SLOfit. Through My SLOfit, individuals can follow their development, assess health risks or get advice. The web platform facilitates cooperation between the educational and health system enabling a holistic approach to developmental difficulties. The My SLOfit application works as a powerful communication tool with other platforms, including a website ([www.slofit.org](http://www.slofit.org)), and Facebook. This article presents the basic features of the SLOfit surveillance system and highlights its development as a support tool for efficient, holistic data use.

## KEYWORDS

physical fitness; children; physical education; population health; feedback

## DOI

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## INTRODUCTION

Physical activity takes place in a variety of contexts, most commonly in children during play, leisure sports training, physical education at school, active transport to school, and via organized sporting activities. In the broadest sense, physical activity incorporates any movement where the muscle work represents a significant increase in energy consumption compared to rest (Caspersen, Powell, & Christenson, 1985).

The amount and intensity of physical activity results in the improvement of physical fitness which is linked to reduced health risks and increased quality of life. Individuals with sufficient level of physical fitness can effectively carry out their daily activities without premature fatigue, and with sufficient energy. Sufficient level of physical fitness refers also to the ability to overcome an above-average physical stress of unexpected events (Clarke, 1979). Indicators of physical fitness include a full-spectrum of physical properties such as cardiovascular fitness, muscle strength, speed of movement, agility, coordination, flexibility, and can also include body composition as a physical factor. Body composition can be used as an indicator of physical fitness since it affects both work and leisure activities; it is an indicator of both health and potential health risks. In this definition, physical fitness includes morphological characteristics of an individual which influence other parameters of fitness.

Higher level of physical fitness in childhood and adolescence is associated with healthier cardiovascular and metabolic profiles and decreased risk of developing cardiovascular diseases later in life (Ruiz et al., 2009). In addition, improving physical fitness has a positive effect on mental health (Glenister, 1996) and improves the quality of life (Crews, Lochbaum, & Landers, 2004; Dwyer, Sallis, Blizzard, Lazarus, & Dean, 2001; Sung, Yu, So, Lam, & Hau, 2005; Swallen, 2005). In this regard, physical fitness in childhood and adolescence can serve as an important indicator of overall health in later stages of life.

### **What to monitor, physical activity or physical fitness?**

Assessing physical activity in regard of energy consumption above resting state remains a very challenging task despite all the technological advances in the field. Using any kind of wearable devices to assess physical activity in daily life is faced with numerous problems and the reality is that any two different devices will provide two different estimations. The problem is manifold: the definition of exercise intensity thresholds, frequency of data collection, wear time, the inability of the device to differentiate between different types of movement (e.g. cycling, walking, water activity). In addition, changes in an individual's behaviour as a response to wearing the device or various environmental factors such as weather conditions can independently affect and distort the usual behaviour we are attempting to assess. Despite these well-documented shortcomings, accelerometer-based measuring devices (i.e. objectively measured physical activity monitors) are much more reliable in assessing physical activity and energy use than subjective information obtained from activity questionnaires alone (Adamo, Prince, Tricco, Connor-Gorber, & Tremblay, 2009).

However, even after obtaining the objectively assessed data on physical activity, there are considerable differences in energy metabolism between different individuals. Various existing recommendations on the frequency, intensity, duration and type

of physical activity are generally ignoring these individual differences and propose universal solutions to specific needs. This means that two children involved in the same physical activity of identical duration and intensity achieve different energy consumption even if they are of the same age, sex, height and body mass. Each of them will respond differently when exposed to an identical physical activity stimulus. Due to the described limitations of physical activity as an indicator of health or developmental outcomes, we believe that measuring the direct long-term response of individual organism to physical activity – their physical fitness – provides us with more reliable indicator of habitual physical activity as well as a more stable factor in assessment of health risks. The American Heart Association has recently recommended physical fitness to be included in the vital health indicators and recorded during each doctor visit (Ross et al., 2016). Many countries are following the recommendations of several international physical health documents (i.e. health promotion activities, HEPAs) to establish systems for systematic surveillance and monitoring of physical fitness on the population level (Andersen et al., 2008; European Commission, 2014; European Council, 2013; World Health Organization, 2015). In Europe, The European Network for the Support of Development of Systems for Monitoring Physical Fitness of Children and Adolescents (FitBack) is currently developed which will provide web application for simple feedback on physical fitness testing as well as important information for stakeholders on establishing such monitoring system (FitBack, 2020).

### **Historical and organisational outline of the Slovenian national surveillance system of physical fitness**

Slovenia can be considered a pioneer in the systematic surveillance of physical fitness of children and youth. Its first national system for surveillance of somatic and motor development in Slovenia, called the Physical Education Chart, was developed already in 1969. However, this system proved to be too ambitious for its time and was never implemented on the population level due to demanding test battery and analytical difficulties in the period when computer support was at its beginnings. It ceased to operate by the end of the 1970s but its simplified version called Sports Educational Chart version was launched in the school year 1981/82. After a six-year piloting period and a slight revision, the system was introduced to all Slovenian schools in the school year 1986/87 (Kovač, Jurak, Starc, & Strel, 2017). Afterwards all Slovenian primary and secondary schools have been carrying out a series of physical fitness tests and anthropometric measurements every April. Every year over 200,000 children and youth aged between 6 and 19 are being measured which means that in 2019 the database included over 7.5 million sets of measurements, belonging to more than a half of the current population of Slovenia.

The test battery includes three anthropometric measurements and eight fitness tests (Table 1). The testing in schools is administered by the PE teachers who have been thoroughly trained for it during their study at the Faculty of Sport, University of Ljubljana which is the only institution in Slovenia educating PE teachers. All the schools follow the same testing protocol and use standard equipment. The results are sent to the Faculty of Sport, University of Ljubljana, Laboratory for Physical and Motor Development, where all the data is centrally analysed and within few days the feedback on the level of individual, class and school is sent back to schools.

**Table 1** SLOfit test battery

Test	Component
Body height	Body composition
Body weight	
Triceps skinfold	
600-meter run	Cardiorespiratory endurance
60-s sit-ups	Muscular fitness
Bent arm-hang	
Stand and reach	Flexibility
20-s arm plate tapping	Skills related fitness
Standing long jump	
Polygon course backwards	
60-meter dash	

Until 1996 the participation in the Sports Educational Chart measurements was obligatory for all children and youth but in 1996 informed parental consent was introduced. The introduction of the consent, however, did not affect the participation rates which have remained over 94% in the primary school population (6- to 14-year-olds) and above 75% in the secondary school population (15- to 19-year-olds). One of the important factors, contributing to high participation rates is also the national PE curriculum which obligates teachers to survey somatic and motor development of children and youth and teach them how to monitor and influence their own developmental progress.

**The scope of the SLOfit surveillance system**

The scope of the SLOfit exceeds the systematic annual physical fitness testing within the educational system, which was implemented with Sports Educational Chart. It still provides direct feedback and information support to teachers, but it now operates an on-line information database of the Sports Educational Chart, which is supplemented by data obtained through questionnaires (on teenagers’ physical activity and sleep habits, basic information on parents, etc.). The SLOfit reporting systems for individuals and schools now enables on-line access of parents to their children’s data which is presented by rich and informative infographics. The SLOfit system is constantly evolving with upgrades so it can handle additional user information like automated input of objectively-measured daily physical activity of children collected through physical activity trackers.

According to the school legislation in Slovenia all primary and secondary schools need to follow the somatic and motor development of their children and youth and they have to offer them a choice to have their data centrally analysed and included in the national database. The exact measurement protocol is published in the Sports Educational Card manual (Kovač, Jurak, Starc, Leskošek, & Strel, 2011), which is

a compulsory tool for every PE teacher and is freely available at the SLOfit web site ([www.slofit.org/ucitelj/administracija](http://www.slofit.org/ucitelj/administracija)).

An important scope of the SLOfit system is to enable individuals to use their data for exercise planning and monitoring so they can improve or maintain their physical fitness throughout their lifespan. With this the SLOfit system encourages them to optimise the quality and quantity of their habitual physical activity. Given the limited possibilities of communication between schools, physicians, municipalities, and parents it is increasingly important to establish this communication and continue improving the conditions for children’s healthy development on both, individual and population level, in their homes and in schools. The SLOfit group is directly developing the system which ensures effective and efficient diagnosing of health risks in children, and suggest the most useful interventions with helpful feedback focusing on the key end-users, including PE teachers, parents, children and school physicians (Jurak et al., 2017). From school year 2017/18 the registered users are already able to access information support through the SLOfit website ([www.slofit.org](http://www.slofit.org)) and a free web application *My SLOfit* ([moj.slofit.org](http://moj.slofit.org)).

With professional support, members of the SLOfit groups can experience a kind of connectivity that enables the introduction of innovative models, contacts, and implementation of early interventions to reduce obesity, or identify deficits in a particular area of somatic or motor development. One of the aims of the SLOfit work group is to have SLOfit data of both children and their parents who participated in the programme some 30 years ago accessible to them. This would allow parents to directly compare their childhood somatic and motor development to the development of their children, and would enable researchers to develop more advanced predictive models that could effectively help the identification of children with increased developmental

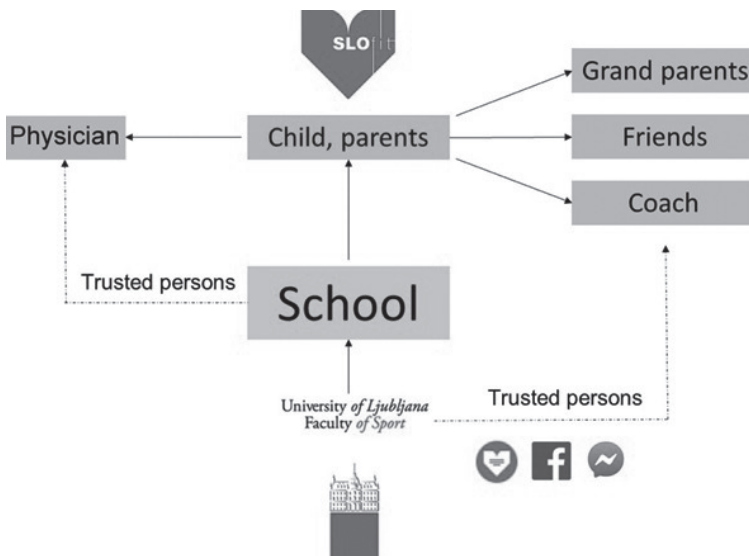


Figure 1 SLOfit user relationships



and health risks and the planning and implementation of interventions. In this way the application will provide lifelong monitoring of physical fitness to individuals and families as a whole.

My SLOfit is constructed as a vital diagnostic and surveillance tool for use in schools (Figure 1). All data use is regulated in accordance with GDPR. Schools are using the system free of charge on the basis of the SLOfit service agreement and appoint a school administrator who is responsible for the communication between the SLOfit team and the school. Every school administrator is responsible for managing all the users in one's school. They are the ones acquiring parental consents, importing the lists of children and parental e-mail addresses, inputting the results of measurements, verifying the submitted school data and communicating the feedback to the school principal, to other teachers, parents and municipalities. All school administrators are required to attend a free of charge training at the Faculty of Sport which is the prerequisite for the schools to start using the My SLOfit application.

It is the school administrator who grants access to children's data to other teachers from the school, while the school can also decide to propose to parents to grant access to children's data to the school physician. However, it is the parents who need to confirm this access and as a result, the school physician is invited to register and become a user. Data are not shared with anyone without positive consent of parents or students already of age (18 years or above). They also have an option to invite any other person to look at their children's data and are the ones who control the data access. The consent to look into individual child's data can be revoked at any time with a few clicks.

Every school year the school administrators import the list of children, currently enrolled in their schools in the My SLOfit application. They can update the list at any time and simultaneously also import the parental data and e-mail addresses of the parents who gave their consent. After the children's data for a certain school year is gathered and inputted in schools, and later checked, analysed and confirmed at the Faculty of Sport, the parents and receive the invitation to either register in My SLOfit if they are the first-time users, or receive a notification that the latest data of their children is now available if they had already been registered before. Finally, parents or students of age 18 can revoke their consent for their personal data to be included in SLOfit at any time by submitting a request within the My SLOfit application. In such case, personal information in SLOfit will be anonymised no later than 15 days after the cancellation request is received.

Parents or students always access their personal and children's personal information with username and password to. They have the right to change their personal data, add new data or change the data they had put in before but they cannot change the physical fitness data that was inputted by the school. All the data in the SLOfit database is automatically anonymised one year after an individual finishes one's education. All the users are notified before anonymisation and are given an option to permanently store and access the data in the application. Anonymised SLOfit data are afterwards used for statistical and scientific research in accordance with the agreement of the Commission on Ethical Issues in Sport No. 6-2019-539.

## Diagnosics of physical fitness in SLOfit

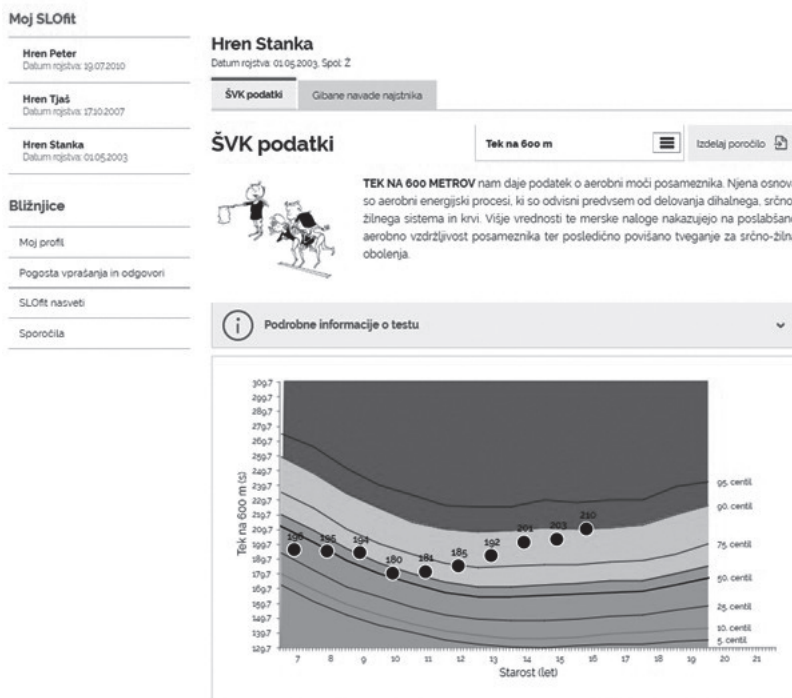


Figure 2 Parental view in the My SLOfit application – longitudinal development of one of the fitness components

The My SLOfit application provides schools and individuals with administrative and analytical support in collecting, storing and displaying the data. It is customized for use on different screen sizes (PCs, laptops, smartphones, tablets). Users can access their results and receive feedback (Jurak et al., 2017), for example: the change rate in one year, the trends of their somatic and motor development throughout the years of their schooling, comparison of their scores with the population (expressed in percentile value), and in which group of physical performance or health risk individual results are classified. If a parent has more than one child the information for all children can be accessed within one's user account (Figure 2).

The triceps skinfold, BMI and fitness data in the My SLOfit application are presented according to health risks, based on the existing scientific evidence (Laurson, Eisenmann, & Welk, 2011; Morrow & Zhu, 2008; Starc et al., 2016; Welk, Going, Morrow, & Meredith, 2011). Health risks are increased when subcutaneous fat and/or BMI are high or very low. On the other hand, the results of fitness tests have a one-way risk direction – the better the result, the smaller the risk. General direction of the individual test depends on its characteristics. In some cases, a lower absolute and percentile value is more beneficial to health outcomes (e.g. 600 meter run is expressed as time meaning

the shorter time the faster run), whereas in other tasks, the opposite is true (e.g. bent-arm hang time is also expressed as time but the longer the time the better the result).

The presentation of physical fitness results and their corresponding motor abilities and physical characteristics also points out the trends of development and highlights the areas where elevated risk is emerging. Parents can contribute to information on their own (described below), and they can also obtain additional information from the child's teacher. PE teachers are trained in the correct interpretation of the physical fitness data and use this data to plan, implement and monitor the effectiveness of their work.

Improving cooperation and enabling communication between the school, parents and healthcare system is an important added value of the SLOfit system that helps in reducing health risks for children and adolescents who may be overweight, physically inactive or have low physical performance. This cooperation was traditionally limited only to the regular, systematic health checks but with a possibility of school physicians to access individual child's data, this data becomes a part of an on-going surveillance which helps in identification of at-risk children.

By looking at the data of an individual child, a physician can obtain information on the longitudinal somatic and motor development of a child and can compare it with other data collected in the SLOfit (Figure 5). These data enable physicians to get a better insight into children's development as a basis for writing recommendations for individualisation in PE class, or inclusion in any other intervention program. Kinesiologists, as members of the healthcare team, can construct individual exercise programs in collaboration with the PE teacher for every child with diagnosed increased risks. In the case of inclusion of a child in the treatment and in the programs managed by the health system, this information also enables the physicians to monitor the effects of the treatment or the intervention. Algorithms of cooperation between the health and school teams, and diagnostics for physicians using My SLOfit are constructed and the treatment is conducted to improve exercise capacity and nutritional status of children (Truden-Dobrin et al., 2019).

### **Individual SLOfit report**

There are currently three levels of feedback available to every individual user of the My SLOfit application: 1. longitudinal development of physical fitness for all years of schooling (in HTML format; Figure 2 ), 2. the current status of physical fitness (in PDF format; Figures 3 and 4) and 3. physical activity and sleep habits (in the PDF format; Figure 5).

Results for children and adolescents are evaluated according to health benefits/risks and give information about the position of an individual within the population of one's peers (of same age and sex). The different health risk areas are marked with different colours: green = healthy zone, yellow = low risk – recommended improvement, red = increased risk – necessary improvements. Reports also provide explanations to enable users to better understand the classification.

The on-line reports in My SLOfit have links that lead the child or adolescent and his parents to tips for improving individual components of physical fitness and other important information related to physical fitness and physical development of the child. Within the application My SLOfit parents can directly communicate with teachers

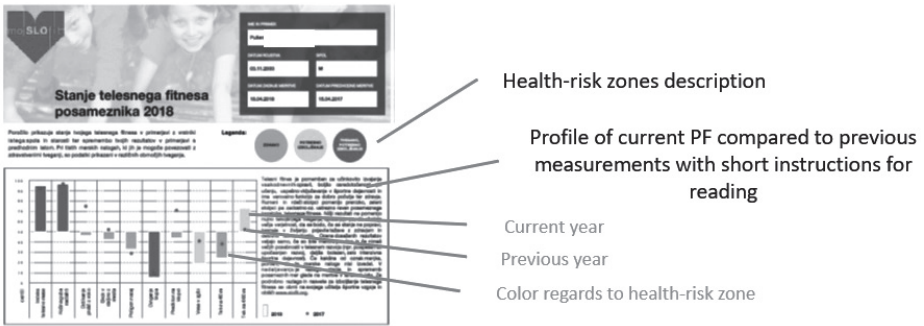


Figure 3 Excerpt from the individual report on the current of physical fitness status – personal physical fitness profile

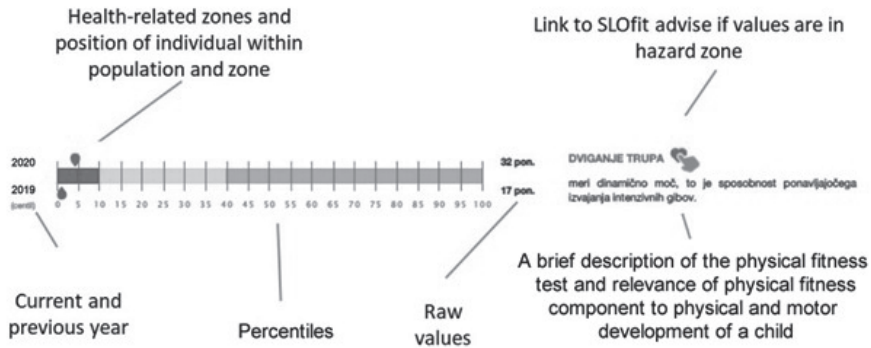


Figure 4 A detail from the individual report on the current physical fitness status – results of individual test

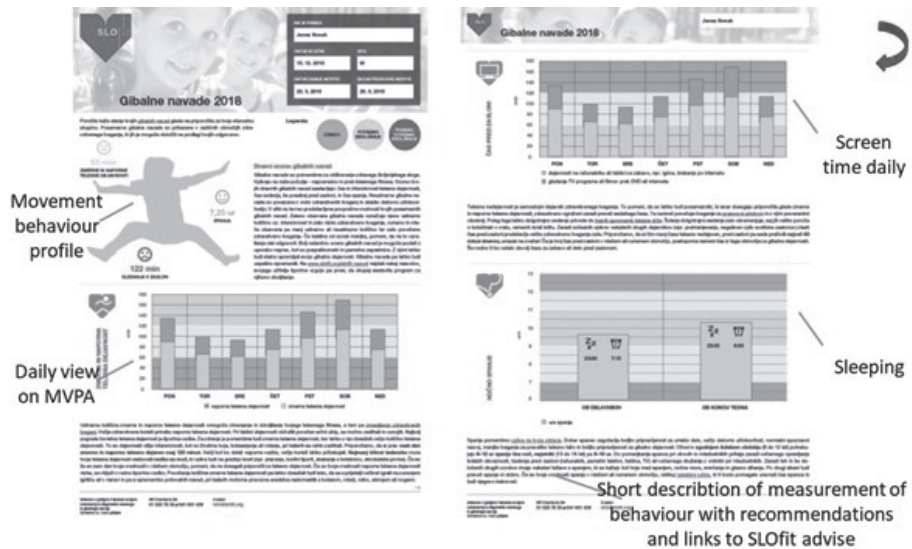


Figure 5 SLOfit report on physical activity and sleep habits

while teachers can involve the SLOfit team from Faculty of Sport into this communication when a higher level of expertise is required. Otherwise, parents can also follow the professionally-moderated SLOfit Facebook profile page with up-to date information on different aspects of physical activity, physical fitness and healthy lifestyles.

Additionally, the SLOfit system enables users (parents or adolescents) to complete a report on weekly physical activity. This includes a daily account of moderate and vigorous physical activity, screen-time and sleep habits. After the completion of the questionnaire, the users can generate a report with the health risk assessment and compliance with the existing recommendations and links to advices.

### School SLOfit report

Within the school administrator’s profile, schools can access the School SLOfit report which has three levels: 1. the current status of physical fitness of each class (Figure 6), 2. physical fitness profile of each class with the share of at-risk children (Figure 6), and 3. the current status of physical fitness of the entire school and longitudinal trends of different components of physical fitness (Figure 7).

The class-level of school report enables teachers to diagnose the physical fitness status of an individual child or entire class, which enables appropriate individualization or differentiation of the learning process within the regular PE classes.

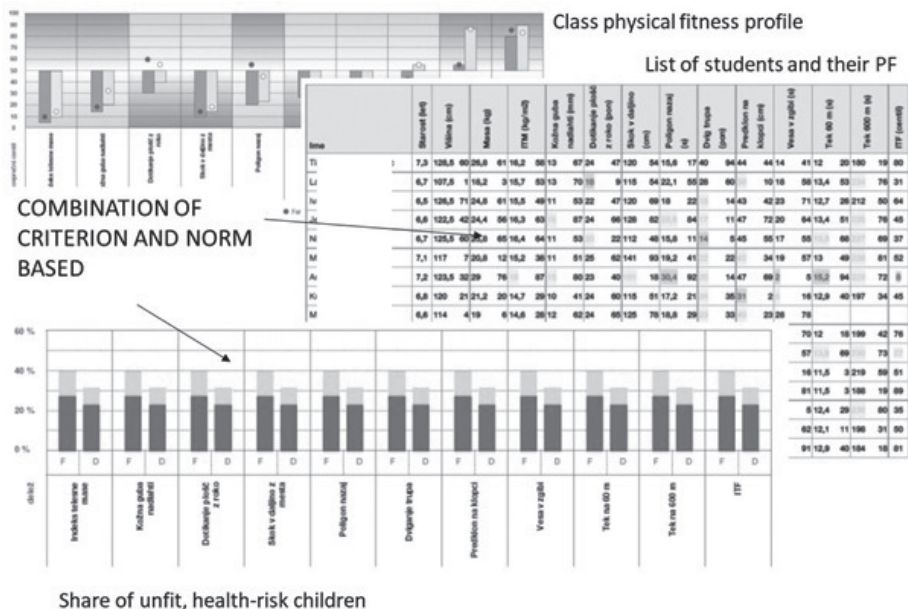


Figure 6 Some excerpts from the class-level of school report

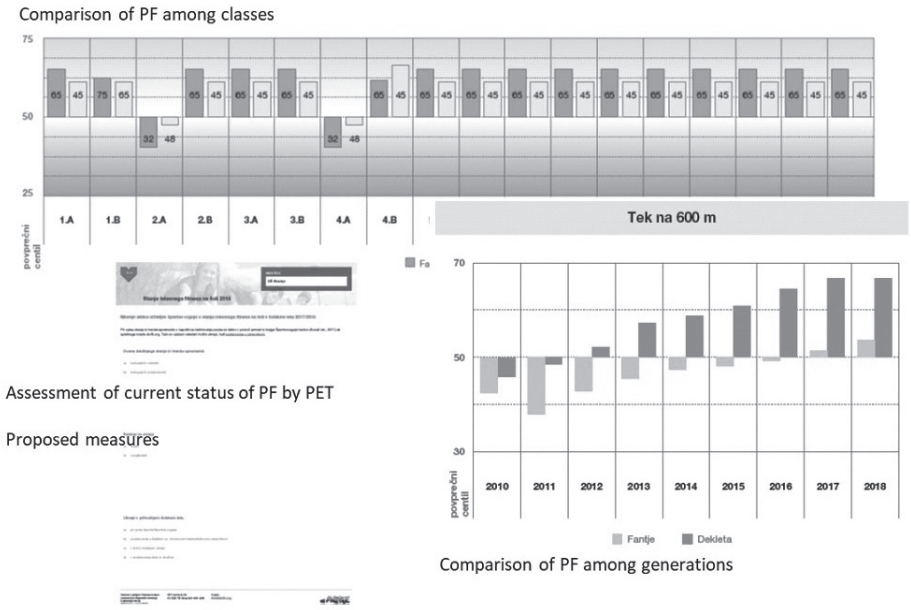


Figure 7 Some excerpts from the school SLOfit report – current status of physical fitness of the entire school

The school report allows PE teachers to analyse in detail the status of physical fitness in and between classes, and between generations of children, by gender and by individual physical fitness components. The reporting system is designed in such a way that PE teachers can supplement the report with the specifics they have identified during the school year and are important for interpreting and understanding the results and for improving the situation. On this basis, PE teacher may propose new measures for the coming school year to the school management. The report thus provides a good overall picture of the status of physical fitness for a given group of pupils, as well as straightforward identification of children at risk in a given class and across the school. In this sense it provides an excellent basis for planning regular PE classes as well as other activities of the extra-curriculum (supplementary PE classes, physically active morning care, school sport activities, physically active recesses, etc.) with the aim of improving physical fitness with more physical activity within school setting (Jurak et al., 2016; Poličnik et al., 2016; Strel, Jurak, Starc, & Strel, 2016).

**Looking forward**

Along with its existing features, the information infrastructure of the SLOfit system offers a variety of upgrade options. The SLOfit team has already designed a system for lifelong physical fitness surveillance using the SLOfit system, which will allow individuals to check and evaluate their physical fitness well into adulthood. Another possible upgrade of the SLOfit system is the acquisition of physical activity data from smart wristbands and their inclusion in the individual SLOfit report. This will enable a unique follow-up possibility to physical activity interventions. Currently the SLOfit



team is constructing predictive models of somatic and motor development which will enable researchers to estimate future trends in fitness changes and thus evaluate the effects of different interventions on a population in a near-real time. The SLOfit team is closely following the development of artificial intelligence technology that could allow the collection and analysis of large amounts of data on individual's movement habits (e.g., physical activity data from wristbands, movement through geographical location, use of public transport, ), which could further improve the predictive models and enhance people's lifelong physical fitness. The SLOfit system is guided by the goal to promote physically-literate and non-sedentary lifestyle behaviour patterns in Slovenian society, supported by high-quality data.

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# Motives of high school students to participate in sports

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## ABSTRACT

The aim of study is to expand the knowledge of motives of Slovak high school students to participate in sports (at school but also in extracurricular activities after school) and identify the differences between boys and girls in adolescent age. The research group consisted of 318 high school students (boys:  $n = 154$ ,  $16.77 \pm 1.01$  years old and girls:  $n = 164$ ,  $16.54 \pm 1.14$  years old) from various areas of Slovakia. The questionnaire Exercise Motivations Inventory was used as the research tool. The questionnaire contains 54 items to which the respondent answers on the Likert scale. Kolmogor-Smirnov's test did not confirm the normality of the research group's data. The nonparametric Mann-Whitney U test was used to evaluate the significance of the differences in motives between girls and boys. For effect size was calculated coefficient  $r$ . The most important motive to participate in sport for boys is motive to gain strength and endurance and for girls is motive positive health. We can see significant differences in motives to participate in sports between girls and boys, where boys have higher score in motives affiliation ( $p = 0.001$ ,  $r = 0.18$ ), appearance ( $p = 0.012$ ,  $r = 0.14$ ), social pressure ( $p = 0.006$ ,  $r = 0.15$ ), social recognition ( $0.001$ ,  $r = 0.29$ ) and strength and endurance ( $p = 0.001$ ,  $r = 0.23$ ). Significantly higher score girls have in motive weight management ( $p = 0.009$ ,  $r = 0.15$ ). Our results can help teachers of physical education, trainers, sport educators and parents to plan thematic units, sport activities, which are of interest and attractive in age of adolescence.

## KEYWORDS

motivation; adolescence; sport activities

## DOI

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## INTRODUCTION

Whitehead (2004) thinks about question, why only less than a quarter of the population is engaged in regular sporting activity, when there is an evidence of the health benefits of physical activity over the past 20 years. The answer to this question finds in psychology area – specifically in motivation. Nakonečný (1996) talks about motivation as a process of behavior with an individual to achieve specific target states and understands it as a process of increasing or decreasing activity, mobilizing and energizing the organism. According to Švancara (2004) motivation also has a function in which the most important is to satisfy the needs of human, which may be due to lack of being. The role of motivation in this case is to arrive at a certain goal and that is to satisfy the needs. Murphy, Nevill, Neville, Biddle and Hardman (2002), treat the motivation as an inner strength that arises between people and their acts to propel them mutually.

According to Macek (2003) is the period of adolescence a complicated process, especially when it comes to the relationship to sport, sport activities. Most adolescents in this period cease regular sports activities and it is mainly influenced by peers, but nowadays it is mainly modern electronics. There are several studies that show a decline in sports and physical activity during adolescence (Sigmund et al., 2003; Nemček & Rábara, 2017). The growing problem of the alarming state of physical inactivity in children and then in adults causes an increased occurrence of civilization diseases (Bajanová & Lipková, 2009; Šimonek, 2003). Due to the abundant statistics on the health of the population, it is necessary to look for opportunities to motivate the young generation in the field of physical, especially sports and recreational activities (Šimonek, 2006). According to a range of studies (Darayi, 2006; Leondari, Syngollitou, & Kiosseoglou, 1998), various stimulators are available through which it is possible to activate students, for example, by leading them toward specific, partial goals, increasing rewards, encouraging positive emotions and feelings of satisfaction.

## METHODS

The research group consisted of 318 high school students (boys:  $n = 154$ ,  $16.77 \pm 1.01$  years old and girls:  $n = 164$ ,  $16.54 \pm 1.14$  years old) from various areas of Slovakia. The questionnaire Exercise Motivations Inventory (EMI-2) (Ingledeu and Sullivan, 2002) was used as the research tool. The questionnaire contained 54 items to which the respondent answered on the Likert scale. The questionnaire consisted of 14 scales: Affiliation, Appearance, Challenge, Competition, Enjoyment, Ill-Health Avoidance, Nimbleness, Positive Health, Revitalisation, Social Pressure, Social Recognition, Strength & Endurance, Stress Management, Weight Management. The data were processed statistically. Kolmogor-Smirnov's test did not confirm the normality of the research group's data. The nonparametric Mann-Whitney U test was used to evaluate the significance of the differences in motives between girls and boys. The significance level was set at  $\alpha \leq 0.05$ ,  $\alpha \leq 0.01$ . The rate of dependence (effect size) between the two groups of features was conveyed by means of the coefficient  $r$  ( $r > 0.90$  – very large effect size,  $r = 0.70$ – $0.90$  – large effect size,  $r = 0.50$ – $0.70$  – medium large effect size,  $r = 0.30$ – $0.50$  – small effect size,  $r < 0.29$  – very small effect size) (Pett, 1997).

## RESULTS

For a better interpretation of the results in Figure 1, you can see distribution of score between girls and boys in the different motives to participate in sports. More detailed numerical forms of results with standard deviations, significance and effect size you can find in Table 1.

In the Figure 1 we can see the most popular motives to participate in sports. In a group of boys dominates on first place motive strength & endurance with score  $3.83 \pm 1.06$  points. On the second place is motive positive health ( $3.66 \pm 1.12$  point) and on the third most popular motive for boys is motive appearance ( $3.40 \pm 1.24$  point). On the other hand the least popular motive to participate in sports for boys is motive social pressure with score  $0.70 \pm 0.80$  points. In a group of girls we can find in the first three places same motives to participate in sports like in groups of boys, but rank is differently. Motive positive health with score  $3.40 \pm 1.21$  points is the most popular motive to do sport in a group of girls. On the second place is motive strength & endurance ( $3.29 \pm 1.23$  point) and on the third place motive appearance ( $3.12 \pm 1.11$  point). The least favorite motive to participate in sports for girls is the motive social pressure with score  $0.49 \pm 0.69$  points.

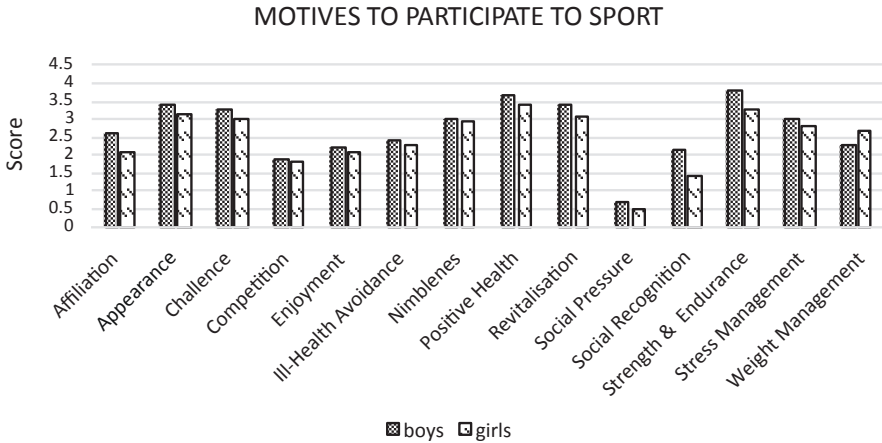


Figure 1 Descriptive statistics of motives to participate in sports according to gender

In Table 1 we can see significant differences in motives to participate in sports between girls and boys, where boys have higher score in the motives affiliation ( $p = 0.001$ ,  $r = 0.18$ ), appearance ( $p = 0.012$ ,  $r = 0.14$ ), social pressure ( $p = 0.006$ ,  $r = 0.15$ ), social recognition ( $0.001$ ,  $r = 0.29$ ) and strength and endurance ( $p = 0.001$ ,  $r = 0.23$ ). Significantly higher score girls have in motive weight management ( $p = 0.009$ ,  $r = 0.15$ ).

**Table 1** The mathematical-statistical characteristics of the research sample according gender and differences in particular motives

Motives	Boys		Girls		Mann-Whitney U test		Effect size
	x	SD	x	SD	U	p	r
Affiliation	2.59	1.33	2.08	1.43	9946.5	0.001	0.18
Appearance	3.40	1.24	3.12	1.11	10579.0	0.012	0.14
Challenge	3.27	1.21	3.03	1.22	11142.5	0.069	0.10
Competition	1.92	1.26	1.81	1.33	12024.0	0.460	0.04
Enjoyment	2.25	1.25	2.08	1.31	11518.5	0.175	0.08
Ill-Health Avoidance	2.43	1.08	2.27	1.24	11462.0	0.154	0.08
Nimbleness	3.02	1.38	2.94	1.35	11991.5	0.436	0.04
Positive Health	3.66	1.12	3.40	1.21	11065.0	0.055	0.11
Revitalisation	3.38	1.00	3.09	1.26	11138.5	0.068	0.10
Social Pressure	0.70	0.80	0.49	0.69	10421.5	0.006	0.15
Social Recognition	2.16	1.31	1.42	1.22	8458.5	0.001	0.29
Strength & Endurance	3.83	1.06	3.29	1.23	9303.5	0.001	0.23
Stress Management	3.04	1.16	2.78	1.40	11353.5	0.119	0.09
Weight Management	2.29	1.33	2.68	1.33	10506.5	0.010	0.15

## DISCUSSION

Several studies (Bohačiková, 2017; Hroššo, 2016; Kukurová, 2015; Šmela, 2014; Litvo-ová, 2014; Kilpatrick et al., 2005; Ingledeew & Sullivan, 2002) point to the importance of the motive positive health leading to participate to sport in adolescence in both genders.

A research Crerand et al. (2020) shows the importance of appearance during adolescence in both sexes. Currently the appearance and its presentation play an important role especially on social networks. A study Chang, Li, Loh, & Chua (2019) of Singapore adolescent girls' selfie practices, peer appearance comparisons, and body esteem on Instagram points out of the findings that objectifying standards of beauty may permeate adolescent girls' value systems through frequent appearance comparisons on social media.

The possibility of adolescents to create relationship with physical activities is conditioned how active are people (family, friends ...) around, an offer of physical activities in school and an offer of leisure time activities, that are competitive for physical activities (Rychtecký & Fialová, 2004).

In recent years Blahutková (1995), Došla (2006), Strešková (2007) have dealt with this issue, too. From conclusions of their studies it can be generally said, that within age rising, there is decreasing competition and the desire to identify with sporting idol. Factor of friendship like motive to participate to sport loses its importance. On the other hand there is increasing importance of motives positive health, regeneration, strength and endurance and of course appearance, image and weight reduction.

## CONCLUSION

Adolescence is an important milestone in which young people can create and adopt an active lifestyle, but nowadays there is a change in reducing the frequency and quality of physical activity and consequently a greater incidence of sedentary behavior. One of possibilities how to stop this secular trend is to identify the motives for participating in sports activity and offer them attractive thematic units within the school physical education cooperating with these motives. Our results can help teachers of physical education, trainers, sport educators and parents to plan thematic units, sport activities, which are of interest and attractive in age of adolescence. Physical education teachers, trainers, sport educators have the opportunity to open a new thematic unit according to the motivational structure of students or rather according to their motives to participate in sports. In our opinion, the study finds its place in the social field too. Based on the identified motives to participate in sports parents can help plan adolescents' leisure time and support them to spend it actively with them.

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## Conflict of Interest

The authors declare that there are no conflicts of interest.

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# A quality framework for assessing the designed curriculum – a basis for the Czech PE curriculum revision

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## **ABSTRACT**

This paper presents a general curriculum quality framework that has been developed on the basis of research in the Czech Republic and internationally. The cogency of this framework and its relevance to the Czech PE curriculum is demonstrated by reference to curriculum research. Finally its potential as a quality assessment tool for the review of the Czech Physical Education curriculum is discussed.

## **KEYWORDS**

curriculum quality; curriculum quality characteristics; curriculum review; physical education curriculum; the Czech Republic

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## INTRODUCTION

Since the fall of communism in the Czech Republic in 1989 significant educational reforms have taken place, including major reform of the Czech school curriculum. The current national curricular documents (the Framework Educational Programmes – FEPs) were issued from 2005 onwards for the different levels of education.

The general Czech curriculum, in its concept and design, is perceived as problematic (e.g. Dvořák, Starý, & Urbánek, 2015; Janík, 2013; Janík et al., 2018, 2019; Kuhn, 2011, etc.). According to Šíp (2014), this is due to the inadequacies of the reform process and the fact that the strengths and weaknesses of the original curriculum were not clearly established prior to the reforms. We agree with this view (c.f. Kuřina, 2014; Vlček, 2019) and also believe that the changes were not sufficiently discussed beforehand, with academic experts, in schools or with teachers. This might be the reason behind the unsatisfactory outcomes of the curricular reform and the failure to accept some changes.

There is also a large body of research, which indicates that the physical education (PE) curriculum in the Czech Republic is not working as it should (Habrdlová, Lupač & Vlček, 2017; Lupač, 2016; Habrdlová & Vlček, 2015; Mužík & Vlček, 2016; Tupý, 2018; Vlček & Mužík, 2012; Vlček, 2019). From the reform's beginning, a health concept underpinned the Czech PE designed curriculum. Despite the fact that the programmes have been shown to be problematic (Mužík & Vlček, 2016) and have been subject to ongoing content reviews, approved by the Ministry of Education and Sport (MEYS), the health oriented concept of the Czech PE curriculum has not changed significantly and in fact in educational practice different PE concepts still prevail (Fialová, Flemr, Marádová, & Mužík, 2014; Vlček, 2019). The research also shows that there is a lack of internal congruence in the PE curriculum between the health-oriented learning objectives and the more balanced educational content (health/movement) and that the health-oriented PE concept is not accepted by the public and is not being implemented by teachers (cf. Fialová et al., 2014; Vašíčková, 2016; Janík, Vlček, & Mužík, 2016).

In 2018 the MEYS has announced a new cycle of revision for the Czech FEPs which will also affect the PE designed curriculum. This project is now referred to as *Revision of the FEP and preparation of the Education Policy Strategy of the Czech Republic until 2030+* (Strategy 2030+)<sup>1</sup>. In January 2019 an expert group was established under the leadership of Prof. Arnošt Veselý. Their task is to prepare the initial document Guidelines for Education Policy of the Czech Republic 2030+ to define the vision, priorities and objectives of education policy beyond 2030. It will describe what should be achieved and how these goals can be achieved.

For the purposes of the review it is important that the quality of the existing curriculum is assessed but the question is how, and what tools can be used. In 2011 an interdisciplinary team, which included the author, conducted an expert survey of experienced directors (head-teachers) and teachers in grammar schools<sup>2</sup>, to hear direct-

<sup>1</sup> For more information see <http://www.nuv.cz/t/rvrvp>.

<sup>2</sup> A grammar school is a selective high school at the stage of upper secondary education typically beginning at age 15 or 16 years (ISCED 3).



ly from experts in the field regarding what makes a quality designed curriculum (Janík et al., 2011). These results were combined with similar studies conducted in the Czech Republic and abroad (Böttcher, 2006; Dvořák, 2012; Dane & Schneider, 1998; Egger et al., 2002; Gehrman, Hericks, & Lüders, 2010; Gandal & Vranek, 2001; Halbheer & Reusser, 2008; Havel, 2016; Kurz, 2005; Squires, 2012, 1998; Stake, 1967, 1972; Thijs & Van den Akker, 2009; Zhu, Ennis, & Chen, 2011) and a general quality framework developed (Janík et al., 2011).

Unfortunately, this framework has not been used in discussions about the PE curriculum quality in the Czech Republic. This paper presents this quality framework and discusses its applicability as a potential assessment tool for the planned PE curriculum revision in the Czech Republic.

### To the Curriculum and its quality

It is important to note that the term *curriculum* is not defined consistently by different researchers. In a narrow definition, a curriculum means a teaching program. In the broadest sense, the curriculum means all the learning that takes place at school or in other institutions, both planned and unscheduled (cf. Lawton & Gordon, 1993, p. 66). In this text we view the ‘curriculum’ as somewhere between these extremes.

We distinguish five forms of the curriculum (Průcha, 2002):

- Concept form – vision, rationale or ‘basic philosophy’ underlying a curriculum.
- Designed form – official documents (e.g. syllabi) prescribed at both the government level (the educational framework) and at the school level, but also and associated teaching materials, text books, etc.
- Implemented form – curriculum as interpreted and used (especially by teachers).
- Results form – outcomes of the actual process of teaching and learning.
- Effects form – the impact of the acquired and attained learning outcomes on learners.

Frequently in discussion of the curriculum only the designed form is considered. However, in any quality assessment it is not sufficient to consider just the designed form of the curriculum – all five forms must be taken into account.

Janík et al. (2013, p. 20, cf. Průcha, 1996, pp. 26–27; Helmke, 2007, p. 40) distinguish two different meanings of the term ‘*quality*’ (cf. the Oxford definition of *quality*<sup>3</sup>).

- 1) A descriptive meaning which identifies a desirable characteristic or attribute of a pedagogical phenomenon, for example the practicality of a designed curriculum.
- 2) An evaluative meaning which describes a desirable standard or optimal level of achievement. This involves setting targets using normative approach as defined by Terhart, (2000, pp. 815–816) and their evaluation and measurement using an empirical approach – (Terhart, 2000, p. 817) as for example used in PISA (Programme for International Student Assessment) and TIMSS (Trends in International Mathematics and Science Study).

In this text we use the first definition. This means that quality can be viewed as a complex entity that can be broken down into specific attributes. Through monitoring and evaluation of these attributes, the problematic aspects of a curriculum can be identified (Janík et al., 2013, p. 21).

<sup>3</sup> [www.lexico.com/en/definition/quality](http://www.lexico.com/en/definition/quality)

## The Quality Framework

The framework presented here, developed by Janík et al. (2011), was developed to define the general characteristics of a quality designed curriculum. It comprises specific quality criteria grouped within four key areas<sup>4</sup>. These key areas provide an overall quality framework and the detailed quality criteria describe these areas more comprehensively.

- **Area 1: feasibility and practicality**

Criteria/characteristics:

- 1.1 respects reality and is manageable,
- 1.2 respects teaching/learning practice and is practical,
- 1.3 is instructive, inspirational and motivating for teachers,
- 1.4 is usable in the school environment by managers and teachers,
- 1.5 encourages communication and cooperation in school.

- **Area 2: professional accuracy and congruence**

Criteria/characteristics:

- 2.1 is consistent with similar documents such as assessments and inspection criteria,
- 2.2 is logical and interconnects goals and educational content,
- 2.3 accurately reflects the relevant discipline and the current state of disciplinary knowledge.

- **Area 3: clarity and comprehensibility**

Criteria/characteristics:

- 3.1 is thoughtfully structured and well-arranged,
- 3.2 is written so that it is accessible, understandable and accepted,
- 3.3 it is structurally interconnected,
- 3.4 it is concise but includes the essentials.

- **Area 4: flexibility within overall bindingness**

Criteria/characteristics:

- 4.1 provides a reasonable space for free decision-making,
- 4.2 is durable but provides flexibility for updating educational practice,
- 4.3 provides a desirable degree of uniformity between schools,
- 4.4 it defines what is important for pupils to acquire (the core curriculum) and is binding.

## DISCUSSION

Area 1 requires a quality curriculum to be **feasible and practical**. These characteristics have been identified by many authors (e.g. Janík et al., 2010, 2011; Janík, Slavík, Najvar, & Janíková, 2019; Stabback, 2016; Thijs & Van den Akker, 2009; and in PE Egger et al., 2002; Vlček & Mužík, 2012). As emphasized above, when assessing for feasibility and practicability it is critical that all forms of the curriculum are considered, or, as Thijs & Van den Akker (2009) express it, the expected and the actual.

It is clear that the health-related goals of the Czech PE curriculum are difficult to implement (Mužík & Vlček, 2016) and have not been implemented effectively. Research

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<sup>4</sup> The terminology has been modified in translation to better explain the framework.

has confirmed that curriculum reform in the Czech Republic took place largely on paper, at the documentation level; to a much lesser extent in teachers' mind-set, at the cognitive-emotional level, or in their implemented teaching (cf. Janík et al., 2018; Pešková, Spurná, & Knecht, 2019). Hence, many PE teachers accepted curriculum reform formally, in theory, but not in practice (Vlček, 2019; Janík, Vlček, & Mužík, 2016, p. 139). Despite the health-oriented concept clearly expressed in the Framework Educational Programme for Basic Education (FEP BE) learning objectives, most teachers are not motivated by the health-oriented PE concept and prefer a focus on sport (Fialová et al., 2014, pp. 77–83). Furthermore, research on the results and effects forms of the curriculum show that the levels of physical activity and the health status of the Czech population are unsatisfactory (cf. Antošová & Kodl, 2014; OECD/European Observatory on Health Systems and Policies, 2017; Mítáš & Frömel, 2013). It appears, therefore, that the PE curriculum is problematic presumably in part because it is not feasible and practical.

Area 2 relates to **professional accuracy and congruence**. Congruence (or consistency, coherence, fidelity, or alignment) has been consistently emphasized as a critical quality criterion (Stake, 1967, 1972; Dane & Schneider, 1998; Egger et al., 2002; Thijs & Van den Akker, 2009; Zhu, Ennis, & Chen, 2011). Again, all five forms of the curriculum should be considered. Is the concept underpinning the curriculum congruent with the goals as expressed in the designed curriculum and the subject matter? Do teachers actually teach the designed curriculum? There are many studies which show that this is not the case in the Czech Republic. For example, there is significant incongruence between the exclusively health-oriented learning objectives of the educational area 'Man and Health' and the health-movement oriented PE content. Other research shows that the health-oriented concept form is not accepted by the public (Mužík & Hošková, 2010; Mužík & Vlček 2016) and is not what is being implemented (implemented form) by teachers (cf. Fialová et al., 2014; Vašíčková, 2015, Janík, Vlček, & Mužík, 2016).

Area 3 requires a quality curriculum to be **clear and comprehensible**. This has been shown to be one of the most problematic areas of the Czech curriculum. Teachers have expressed the view that the PE learning objectives in the designed form are too abstract and difficult to understand (Vlček, 2011; Vlček & Mužík, 2012). Another problem is that the FEP BE is conceptually confusing because of the lack of a clear relationship between the visionary key competences of overall basic education and the PE learning objectives and expected PE outcomes (Vlček, 2019; c.f. Knecht, 2014; Píšová, Kostková, & Vlček, 2011), that is, it is not *thoughtfully structured*.

Area 4 relates to the need for a curriculum to be binding and durable but to allow the flexibility to be updated as educational content and practice changes. The two level Czech educational programmes provide considerable opportunity for free decision making by schools and teachers. However, the PE designed curriculum defined in FEP BE is not *binding* and does not contain a *core curriculum* that describes the main learning objectives and educational content of individual disciplines including PE. Therefore, there is a lack in uniformity as far as implemented curriculum is concerned (as described above) and especially in the results curriculum form in terms of learning outcomes evaluation (cf. Fialová, 2015, p. 54).

## CONCLUSION

It is clear that the quality framework presented here is consistent with the numerous research studies on curriculum quality and also with research into the PE curriculum. It is a comprehensive tool that takes account of all the different quality criteria that have been identified. It provides a tool to comprehensively assess quality of a curriculum.

In the introduction we referenced a large body of research that indicates that the designed curriculum in the Czech Republic, including PE, is not working as it should, and that a national review is currently underway. As a part of the review process, studies for the revision of the curriculum for particular school subjects have been prepared, including a study by Tupý (2018) identifying problem areas of the PE curriculum, also in the designed curriculum. However, the issues of curriculum quality are extensive, complex, and often multifactorial (c.f. Fend, 1998, 2008; Hopmann & Riquarts, 1995; Hopmann & Gundem, 1998; Thijs & van den Akker, 2009) and there are issues with all five forms of the Czech PE curriculum which should be addressed (Vlček, 2019). In our view only a comprehensive quality framework such as presented here, while developed in relation to the curriculum generally, can provide a sufficiently robust tool in the upcoming PE curriculum review and redesign in the Czech Republic.

Although we believe that a rigorous and comprehensive review of the curriculum, based on all five forms, is an essential prerequisite to a quality redesigned PE curriculum, it is important to note that comparative research (Vlček, 2019) and other texts critiquing the Czech PE curriculum (Habrdlová, Lupač, & Vlček, 2017; Lupač, 2016; Habrdlová & Vlček, 2015; Mužík & Vlček, 2016; Tupý, 2018; Vlček & Mužík, 2012) have shown that the designed PE curriculum in the Czech Republic is largely consistent with the curriculum of other developed countries in Europe and also USA. This is an important observation; it means that the Czech PE curriculum, while it may have some problems, is not fundamentally broken or significantly different from the curriculum in other countries.

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# Promoting physical activity as a healthy habit through quality physical education: Does knowledge on habitual behaviours help?

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## **ABSTRACT**

Childhood and adolescent obesity have become one of the most important challenges to overcome in the 21st century. Practiced regularly, physical activity (PA) has significant benefits for health in youth, such as normal growth and a reduction of the risk of suffering from obesity and associated health problems. The role of habits for the engagement in PA are discussed. Understanding how habits are developed may help comprehending that PA can become habitual. Furthermore, that knowledge is useful for designing interventions to rise the levels of participation in PA for health campaigns (promoting PA maintenance for long-term health) and NCT prevention.

PE also plays an important role in the promotion of PA among children and adolescents, especially when quality physical education is implemented.

## **KEYWORDS**

motivation; behavioural change; complex behaviours; physical education; health

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## INTRODUCTION

Youth overweight and obesity have developed as one of the most important challenges to overcome in the 21st century. It's a global problem and it is increasingly touching numerous nations, especially in metropolitan locations. The prevalence among children and adolescents aged 5–19 has augmented significantly from only 4% in 1975 to more than 20% in 2018. 41 million of children under the age of five are overweight (WHO, 2019). Overweight and obese children and adolescents have a high probability staying obese as adults and more likely to acquire noncommunicable diseases (NCD, e.g. diabetes and cardiovascular diseases) at a younger age. Overweight and obesity, as well as the associated diseases, are mostly avoidable. Therefore, prevention of childhood and adolescent obesity needs high priority (Ng et al., 2014).

Lifestyle is characterized as the behaviour of an individual or community and it refers to routinely repeated behaviour in daily life. Lifestyle behaviours include a sequence of healthy habits: physical activity (PA), adequate diet, no tobacco and no alcohol, etc. Lifestyle is mainly influenced via the creation of a hierarchy of values and needs but also by tradition, customs and trends (Galan-López, Sánchez-Oliver, Ries, & González-Jurado, 2019).

Practiced on a regular basis, PA has important benefits for health in children and adolescents, such as normal growing and a reduction of the risk of suffering from obesity and associated health problems (Galan-López et al., 2020). Physically active children and adolescents show higher academic achievement, better classroom conduct, more ability for concentration, and less non-attendance than their unfit peers. WHO (2010) determines that both physical and mental health benefits are attained when children and adolescents should practice at least 60 minutes of medium to vigorous intensity physical activity per day.

Schools are contemplated as one of the favourite intervention settings for promoting daily PA in children and adolescents. Physical education (PE) classes are a perfect scenario for fostering a healthy lifestyle and create PA habits (Ferriz, González-Cutre, Sicilia, & Hagger, 2016; Solmon, 2015). In order to make PE curricula significant for young people, innovative learning theories and novel insights of PE must to be studied, assessed and applied (European Commission, 2008). Considerable current data shows a decline in the attitudes of children and adolescents towards PE because of the supremacy of competitions and performance-based activities.

### **The importance of a quality physical education (QPE)**

In order to tackle public health alarms about the evident low levels of PA among young people broad policy including QPE is essential. QPE is defined as a planned, progressive, and inclusive learning experience in early childhood, primary and secondary education. For many young people, particularly those from less privileged backgrounds, PE represents their only routine of PA (Association for Physical Education, 2008).

Thus, QPE should help establishing a lifelong engagement in PA. The learning experiences proposed to children and adolescents through PE lessons must be developmentally suitable to help them obtain the psychomotricity, the cognitive understanding, and the social and emotional abilities necessary for a physically active life

(Centers for Disease Control and Prevention, 2010; Harris, 2015; Van Dusen, Kelder, Kohl, Ranjit, & Perry, 2011).

Besides to receiving valuable learning opportunities in QPE, many other occasions to be physically active within the school setting should be offered. A very effective method of increasing PA opportunities in schools should be installed through a whole school approach to activity and health promotion. Such a concept has a wider focus and involves the creation of a school philosophy and environment which supports and facilitates PA for all pupils and teaching staff (Harris, 2015).

In order to use QPE to the attainment of healthy lifelong habits, PE curricula should be flexible, and accessible to modification, so PE staff are allowed to adapt it to the different needs of their pupils. Meetings with the students could help to guarantee their interests and in order to reflect their needs, and to reinforce wider community commitment through PA.

As the main purposes of PE do not relate only to the promotion of PA and because the time available for PE classes is limited, actually the best PE program does not offer enough PA in order to meet the recommendations for healthy and active lifestyle. The quality of QPE lessons may be measured by the level of PA, but children and adolescents also need to develop movement and behavioural abilities that empower them to be active in and outside the school context. Consequently, alongside QPE, supplementary extra-curricular approaches for promoting PA, complementary to PE should be encouraged: dynamic lunch breaks and playgrounds, active traveling to school, after-school sports and PA, and finally, a health education policy.

Primary school symbolises a perfect period for children to develop competency in locomotor and object control, basic movement abilities, that can deliver the basis for a physically active life (Lubans, Morgan, Cliff, Barnett, & Okely, 2010). A current study on the durable effects of school-based interventions in order to increase PA, physical fitness and movement abilities, discovered that the continuation of positive outcomes was strongest for movement skills (Lai et al., 2014), meaning more durability compared to PA where the level is low to moderate until adolescence. Other studies have suggested (Fairclough, Stratton, & Baldwin, 2002) that a PE concentrated on competitions in team sports may contribute to the diminution of the levels of PA in adolescence. Subsequently, schools should offer a greater choice and practice of lifelong PA (fitness activities related to a healthy lifestyle) that may be undoubtedly taken into adulthood. In addition, PE should increase knowledge on physical fitness, goal setting and self-monitoring of PA.

### **Contribution of the knowledge on habit for physical activity behaviour**

Understanding how habits are developed may help comprehending that PA can become habitual. Furthermore, that knowledge is useful for designing interventions to rise the levels of participation in PA for health campaigns (promoting PA maintenance for long-term health) and NCT prevention.

Hagger (2019, 2020) suggests distinguishing between “behaviour” and “process or psychological construct” when contemplating habit according to theory and the most recent research. He defines habit “as a specific action or behavioural tendency that is enacted with little conscious awareness or reflection, in response to a specific set of associated conditions or contextual cues” (Hagger, 2019, p. 119). Additionally, Hagger

(2020) recommends including in the definition of habit that “any behaviour can be said to be habitually executed where habit plays some facilitating role. This allows for performances that are partly driven by habit, and partly consciously regulated” (Gardner, 2019, cited in Hagger, 2020, p. 3). Moreover, “qualifying definitions of habits with information on the relative control over actions by automatic and conscious processes, and instigation and execution, may unify the definitions of habit with contemporary theoretical views” (Hagger, 2020, p. 3).

The promotion of a healthy and active lifestyle habit in young people, requires an improvement of the measures of habit and methods to more efficiently analyse habits, particularly habit progress and maintenance.

It is improbable that complex and multifaceted behaviours like PA are completely directed by non-conscious processes. PA is often considered at the macro level by research, but rarely the subactions that comprise those actions are being considered. PA is a prominent illustration of multiple behaviours as it includes a series of coordinated actions that establish the behaviour (Hagger, 2019, 2020).

It is important to denote that behaviours like PA need to coordinate the sets of subactions to achieve, but also to organise, to anticipate, and to make the correct decisions in order to get started. When developing a habit for PA, the enormous effort and deliberations engaged in the decision to practice PA are probably becoming less so. Once having undertaken all the deliberations for taking the decision to go swimming (for example: balancing pros and cons; finding the time, place, clothes, etc.), we tend to become less dependent on such thought processes and start to decide quicker and more efficiently based on ‘saved’ images of the behaviour (Hagger, 2020).

PA habits are established through recurring PA practice in stable contexts (Gardner & Lally, 2018; Hagger 2020; Wood, 2017), but the establishing of PA as a habit is quite variable because of the incidence of several crucial aspects during its development. Lally et al. (2010) reveals that each individual has its own pace in developing habits and that some persons’ behaviour never become ‘habitual’. Additionally, the consistency in performing PA is an important factor in the habit development. Hence, the importance of expanding the range and frequency of PA practice in schools. In this sense, Armitage (2005) and Kaushal and Rhodes (2015) reveal that PA habits can develop after some weeks, taking into account of course the individual differences. Nevertheless, only few longitudinal studies have examined habit development over time and consequently more research is needed.

### **Breaking physical inactivity behaviour**

As beforementioned, and since PA habits foreseeably develop through recurrent participation concomitant with cues or contextual features, the promotion of PA through PE classes should enhance regular and effective practice at school and in extra-curricular situations. Supposing that new behaviours are probable to be controlled by volitional processes from the beginning, such PE programs should firstly concentrate on increasing the motivation to practice PA among children and adolescents. Secondly, a classification of well-defined standards that represent success is required. Positive feedback and goal setting should be used as strategies for that purpose. When children and adolescents have frequent and positive PA experiences during PE classes, they tend to develop these habits. QPE efforts to promote PA habits should consequently motivate

and encourage students to define and build up PA routines. Moreover, they should be guided in order to achieve them on a regular basis and to check the routine for regularity. As the PA habit advances, the repeated behaviour changes its control from a more reasoned process to a more automatic procedure (Hagger, 2019; Harkin et al., 2016).

In order to break the habit of low PA practice among children and adolescents, PE teachers must help their students to struggle consciously and strongly against their typical effortless response, which is well-learned and already automatic. A QPE needs to make children and adolescents aware and motivated for doing things differently from the beginning. PE teachers must communicate adequately with their students in order help them setting up clear intentions or goals for engaging in a regular PA in the future. Young people need to be guided on how to engage in PA and be provided with positive experiences (Johnson, Wolf, & Maio, 2017; Naab & Schnauber, 2016; Prestwich et al., 2014).

It is important to denote that establishing PA habits should include both encouragement by PE teachers through a QPE and a regular practice of PA. As mentioned, PE teachers are the door keepers of their students when it comes to motivate them “to counteract unwanted habits, particularly when cues and prompts to the undesired behaviour are omnipresent in our environment” (Hagger, 2019, p. 123). Promoting successfully PA habits in children and adolescents and the settings in the environment and the characteristics of the individual that may obstruct or simplify habit development, need to be taken into account by PE teachers. They must be key drivers of physical and health literacy and behaviour change to optimize the PA of children and adolescents. At the same time, parents need to be informed about the benefits of a regular PA practice and encouraged to get involved in school-based PA and events.

## END NOTES

Research on habits has helped to understand how PA habits are initiated, but future research needs to bring more knowledge on how healthy habits are maintained over time and new theories need to integrate multiple perspectives. The QPE needs to be considered as an effective PA promotion among children and adolescents within and outside school contexts.

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