

## MODELLING OF PHYSICAL EDUCATION AND PHYSICAL REGIMEN IN LOWER PRIMARY SCHOOLS

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**Abstract:** *The paper presents the results of a subproject pursued within the School and Health for the 21<sup>st</sup> Century (Škola a zdraví pro 21. století) research project (2005-2011). The subproject focuses on physical education in lower primary schools. It deals with the projected and implemented curriculum of physical education as well as pupils' overall daily physical activity. The research methods include content analysis of documents, systematic observation of the interaction in physical education classes, standardised controlled interviews, questionnaires, day time records, and modelling of the physical education curriculum. In addition, educational documents containing the projected curriculum of physical education were analysed. Other deployed methods involve research samples representative of the Czech Republic citizens and available samples of primary school teachers and pupils. The results provide a basis for physical education modelling in lower primary schools. This modelling contains the intervention project Pupils on the Move (Školáci v pohybu) influencing the interaction between the teacher and pupils in physical education classes, pupils' school and out-of-school physical activity, and monitoring of pupils' health and fitness. The aim of physical education modelling is to contribute to the optimisation of the physical regimen of primary school pupils.*

**Key words:** *physical education; physical education modelling; physical activity; physical regimen; lower primary school; projected curriculum; implemented curriculum*

### Introduction

The *School and Health for the 21<sup>st</sup> Century* research project has already been pursued at the Faculty of Education of Masaryk University for six years. This research activity among others involves a subproject concerned with physical education in primary schools, specifically aimed at lower primary schools. The research results obtained over recent years allow the research team to conduct critical analysis of the current state of physical education, deploy the method of curriculum modelling for optimising school

physical education, and prepare intervention into the school regimen and the overall physical activity of pupils at school as well as outside school.

## Theoretical starting points

The subproject is part of research into curriculum and research into pupils' physical activity. It draws on the general knowledge and methodology of curriculum research (Walterová, 1994; Průcha, 2002; Maňák, Janík, Švec, 2008, etc.), furthermore, the knowledge and methodology of physical education curriculum research (Dobry et al., 1997; Naul, 2003; Janíková et al., 2008, etc.) and, finally, the knowledge and methodology of research into physical activity including a theoretical perspective (e.g. Hendl, 2009), methodological perspective (e.g. Bunc, 2009; Frömel, Mitáš, Chmelík, 2009), sociological perspective (e.g. Charvát, Došla, 2008; Sekot, 2009) and health and motivation perspective (e.g. Blahutková, Řehulka, Dvořáková, 2005; Dobry, 2009).

Assessing the interaction between the teacher and the pupil (pupils) in physical education classes represents a major issue in the research into the physical education curriculum. The structure of the interaction between the teacher and the pupils in physical education shows distinct specifics at organisational, performance, didactic and social level. As early as 1976, Widmer pointed out that in physical education pupils present themselves by means of their physical performance nearly all the time and can hardly pretend learning. What is more, non-verbal communication between the teacher and the pupils plays a very important role here. Galloway (1971) therefore modified the well established Flanders FIAS method by adding non-verbal communication to the existing categories.

The extensive study by Piéron (2005) states that the *observations* of behavioural interactions between the teacher and the pupils were commenced by Anderson (1967, 1975). Numerous subsequent research activities were conducted also within the Czech school environment. A detailed overview of research into interaction and observation techniques in physical education classes was written by Drobný et al. (1997), while a more recent information can be found e.g. in Janíková et al. (2008).

Curricular research is often based on the deployment of *questionnaires* (Hagströmer, Oja, Sjöström, 2006; Graff-Iversen et al., 2007, etc.). Their use is motivated especially by economic reasonability and easy processing of results. On the other hand, the shortcomings include low validity, reliability (Shephard, 2003) and objectivity of respondents' claims. The questionnaires were used to find out what a good training unit of physical education meant (Arrighi, Young, 1987; Carreiro da Costa, 1992), or to analyse the teacher's thoughts when making decisions in different phases of training (Houser, Griffey, 1985). In the Czech Republic, questionnaires were deployed e.g. to assess the quality of the so called creative education in physical education (Frömel et al., 1992) or to reveal primary school pupils and alumni's opinions concerning their experience of physical education (Mužik, Janík, 2007; Mužik, Vlček et al., 2010 aj.).

Children's physical activity is most often *monitored* by means of methods based on various devices (sporttesters, accelerometer, pedometers, etc.). Their main advantage is precision as for measuring the volume and intensity of movement, the disadvantage being identifying respective activities, i.e. the content of measured physical activities

(e.g. Hoos, Gerver, Kester, Westerterp, 2004; Scruggs, Beveridge, Clocksin, 2005; Pfeiffer, McIver, Dowda, Almeida, Pate, 2006) . Therefore, records of direct observation (Dowda, Pate, Trost, Almeida, Sirard, 2004; Brown et al., 2006; Sit, McManus, McKenzie, Lian, 2007) or questionnaires (Hagströmer, Oja, Sjöström, 2006; Azevedo et al., 2007; Graff-Iversen et al., 2007, etc.) are also very common.

Other ways of data gathering include individual records with different retrospection periods, diaries of physical activity, proxy-reports, individual or group interviews (Henry, Webster-Gandy, Elia, 1999; Liou Chiang, 2004, etc.) and other specific methods.

The theoretical starting points as well as the above quoted sources are described in detail in Mužík, Vlček et al. (2010).

## Research problem and research aim

The sub-problem of the research project is directed at school physical education as well as school and outside school physical activity in children at lower primary school age. It is based on the thesis claiming that the physical activity of the population (including children) decreases with an increasing age, which has a negative impact on the population's health, especially as for health weakening and diseases linked to muscle imbalances, overweight and obesity. The subproject team therefore posed questions whether school physical education fulfilled its educational and medical functions, whether the physical regimen of pupils at school and outside school was adequate to school possibilities and whether the physical regimen of pupils met children's needs.

The aim of the research resulting from the research problem and drawing on the theoretical starting points was to gather data for critical analysis of school physical education and pupils' physical regimen. The research involved a comparison between the projected and implemented physical education curriculum, and monitoring of pupils' physical activity.<sup>1</sup> On the basis of the findings obtained, the authors intend to create a medically oriented model of physical education, among others promoting a life-long physical activity.

The subproject draws on the *Program of Medically Oriented Physical Education in Lower Primary Schools* (Mužík, Krejčí, 1997; Mužík, 1999). It focuses on the lower primary school age as a period when individuals form their attitudes towards the lifestyle. The subproject reflects the current concept of physical education set by educational documents since 1995 defining physical education as part of health education, resp. education towards a healthy lifestyle (*Standard for Basic Education*, 1995; *Primary School, General Primary School* and *National Primary School* amended educational programmes, 2005; amended framework educational programmes for pre-school and primary education, 2005).

## Methodology

With respect to the research aim, the so called mixed design research was applied as described below.

<sup>1</sup> See [http://www.ped.muni.cz/z21/dilci\\_projekty-muzik.htm](http://www.ped.muni.cz/z21/dilci_projekty-muzik.htm)

Partial aim 1: Critical analysis of physical education concepts, respectively projected curriculum in the Czech Republic and abroad.

Method: Content analysis of texts.

Research sample: Czech and foreign educational documents and comparative resources (Pühse, Gerber, 2005, etc.).

Results structure: Overview of physical education concepts in the Czech Republic and abroad (the so called projected curricula of physical education).

Partial aim 2: Assessing of the implemented PE curriculum.

Methods: Systematic observation of the interaction in physical education classes (SPIN standardised method), questionnaires and standardised controlled interviews.

Research samples: Available samples of primary teachers (n = 60), pupils (n = 1170) and representative samples of Czech citizens aged over 15 (n = 1606 + 1792).

Results structure: Characteristics of teachers' teaching and pupils' learning; teachers, pupils and alumni's opinions on the implementation of physical education curriculum in primary schools.

Partial aim 3: Assessing of the volume, intensity and content of physical activity in lower primary school pupils.

Methods: Questionnaires and day time records.

Research sample: Available sample of lower primary school pupils (n = 138).

Result structure: Volume, intensity and content of school and outside school physical activity in pupils; differences between boys and girls; differences among different primary school grades.

Partial aim 4: Assessing the need for physical activity in lower primary school pupils.

Method: Questionnaire.

Research sample: Available sample of lower primary school pupils (n = 219).

Results structure: Pupils' opinions on the need for physical activity; differences between boys and girls.

## Research results

The main findings can be summarised as follows:

- In foreign countries, physical education is usually embedded in healthy lifestyle education.
- With respect to healthy lifestyle education, foreign curricula opt for different concepts: a) physical education as a separate educational field within the healthy lifestyle area, b) physical education integrated with other educational fields (most often health education), c) physical education formally declared as a field contributing to pupils' physical health and fitness.
- In Czech curricular documents, physical education is defined as a separate educational field within the *Healthy Lifestyle* educational area (*Standard of Basic Education*, 1995), resp. within the *Humans and Health* educational area (*Framework Educational Programme for Basic Education*, 2007). This concept allows for the integration of physical education with other educational fields (e.g. health education) and thus reflects the prevailing foreign trends.

- The above mentioned curricular claim for the integration of physical education with health education is not sufficiently accepted by primary school heads (Mužíková, 2006, 2010), nor it is recognised by the majority of upper primary school teachers, who generally tend to prefer especially sports and gaming activities. According to our research, lower primary school teachers, on the other hand, pursue a more acceptable and complex concept of physical education.
- Though, most Czech citizens are satisfied with the quality of physical education during their school attendance. The observed socio-demographic characteristics (gender, education, permanent address, etc.) generally do not influence the satisfaction with the quality of physical education, the only exception being respondents' age: the youngest group aged 15 to 19 is significantly more often dissatisfied with the quality of physical education than the other members of the population.
- The satisfaction or dissatisfaction with the quality of physical education mostly depends on the way physical education is taught as well as the respondent's attitude towards sports, physical activity and the PE teacher. The most common reason for dissatisfaction is inappropriate character of physical education classes, or inadequate treatment of pupils on the side of the teacher.
- Czech citizens hold the view that the most important thematic areas that should be part of physical education are sports activities and sports games, together with compensatory exercises as a prevention of the weakening of the skeletal and muscular system and, finally, fitness activities for the optimal development of the medically oriented fitness. Czech citizens mostly support the integration of physical education with health education.
- The views of the “fresh” primary school alumni indicate that in Czech schools the educational content of physical education is not implemented to the projected extent. Physical education teachers pay attention especially to sports activities and sports skills, whereas the medical and compensatory activities together with the interest a sufficient physical activity during pupils' stay at school as well as outside school are neglected.
- As evident from direct observation, teachers' teaching activity mostly consists in lesson organisation and classroom management, sports skills, and movement and sports games. Physical education classes usually lack medical fitness and compensatory exercises. Pupils are not sufficiently encouraged to pursue physical activity outside physical education lessons, which confirms the alumni's views stated above.
- According to our findings, neither the volume nor the intensity of physical activity in lower primary school children does markedly decrease with age (which does not confirm the generally approved thesis). However, the increasing age logically brings different types of physical activities. When compared to foreign norms, the whole day volume of physical activity in Czech children of the given age appears to be satisfactory (on average nearly 3 hours per day), but the intensity of strain on different muscular groups is not balanced and sufficient, which probably causes the high incidence of muscular imbalances as well as the excessive occurrence of overweight and obesity, as proved e.g. by Vrbas (2010).

- The inner need for physical activity in children of lower primary school age does not decline with age and appears to be relatively very strong. Nevertheless, a greater volume and intensity of physical activity is prevented by the current regimen of school life as well as by family routines.
- At present, appropriate conditions for adequate physical activity during the pupils' stay at school generally fail to be facilitated. Most schools do not take advantage of all available possibilities (forms) of supporting pupils' physical activity at school (e.g. "PE moments") and neglect their adequate physical regimen. On average, lower primary school pupils spend 286 minutes at school per day, but physical activities account only for 19 minutes of their stay (usually during breaks). In physical education classes (2 lessons per week), pupils physical activities last 23 minutes per a single lesson.

## Physical education modelling and conclusion

The above stated findings served as a basis for critical assessment of physical education and physical regimen of pupils both at school as well as outside school. By means of deploying the *modelling method* we designed the *Pupils on the Move* intervention project, with the aim to optimise the physical regimen of pupils in the school and non-school environment.

When modelling physical education, we drew on Maňák (2007), defining modelling as a procedure leading to the creation of a model allowing for the exploration of complex features, such as systems. The model's function is to identify the important relations and links that are essential for understanding the expected concept.

The *Pupils on the Move* intervention project is divided into four intervention subprojects with the following sub-aims:

- The aim of the *At School on the Move* subproject is to optimise physical education and children's physical regimen while staying at school. Means: Optimised physical education classes, movement-relaxation breaks, PE moments, integrated field classes and other forms of pupils' school physical activity.
- The aim of the *Learning on the Move* subproject is to decrease the volume of sedentary form of education in school subjects. Means: Deployment of the activating learning method "learning on the move" integrating learning process together with physical activities, psychomotor features, drama education, etc.
- The aim of the *All day on the Move* subproject is to optimise the pupils' physical regimen outside the school, while respecting their individual needs and capabilities. Means: Methodology materials for teachers, pupils and parents containing information on the physical activity of humans, motivation tools and ways of monitoring and self-reflection of physical activity in children. The project is based on the cooperation between pupils and parents.
- The aim of the *Fit-test* subproject is field monitoring of the medically oriented fitness in pupils as a starting point for optimising their physical regimen. Means: Methodology materials for teachers, pupils and parents with clear illustrative tests of motor efficiency and body posture.

The intervention subprojects are currently being developed and verified in collaboration with students and primary school teachers. A detailed description is stated in Mužík, Vlček et al. (2010). After its verification and subsequent adjustments, the *Pupils on the Move* project will be made available to teachers, pupils and their parents in the whole of the Czech Republic.

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- Modelling of Physical Education and Physical Regimen in Lower Primary Schools

## MODELOVÁNÍ TĚLESNÉ VÝCHOVY A POHYBOVÉHO REŽIMU ŽÁKŮ NA 1. STUPNI ZÁKLADNÍ ŠKOLY

**Abstrakt:** Příspěvek shrnuje výsledky dílčího projektu výzkumného záměru Škola a zdraví pro 21. století (2005-2011). Dílčí projekt je orientován na tělesnou výchovu na 1. stupni ZŠ. Zabývá se projektovaným a realizovaným kurikulem tělesné výchovy i celodenní pohybovou aktivitou žáků. Výzkumnými metodami byly obsahová analýza dokumentů, systematické pozorování interakce ve výuce tělesné výchovy, standardizované řízené rozhovory, dotazníky, časové snímky dne a modelování kurikula tělesné výchovy. Analyzovány byly vzdělávací dokumenty obsahující projektované kurikulum tělesné výchovy. Výzkumnými soubory při uplatnění dalších metod byly reprezentativní soubory občanů České republiky a dostupné soubory učitelů a žáků základních škol. Získané poznatky jsou východiskem pro modelování tělesné výchovy na 1. stupni ZŠ. Toto modelování obsahuje intervenční projekt Školáci v pohybu, ovlivňující interakci

učitel – žák ve výuce tělesné výchovy, školní i mimoškolní pohybovou aktivitu žáků a monitoring zdravotně orientované zdatnosti žáků. Cílem modelování tělesné výchovy je přispět k optimalizaci pohybového režimu žáků na 1. stupni ZŠ.

**Klíčová slova:** tělesná výchova; modelování tělesné výchovy; pohybová aktivita; pohybový režim žáků, 1. stupeň základní školy, projektované kurikulum, realizované kurikulum