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## The concept of the implementation of present evidence-based knowledge and technology into the preparation of sport professionals

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### Abstract

The study assesses the feasibility of the concept of professional preparation of sport teachers and instructors that attempts to connect education and research activities with the emphasis on presenting evidence-based knowledge and new technologies. The seven-year-long international study involved 670-850 university students annually. Students participated directly in the research activities that were in compliance with the curricula of sport education study programs. The presented educational model describes possibilities and major limits how to provide dozens evidence-based knowledge of prospective sport professionals in the areas of physical activity monitoring, self-assessment of physical fitness and evaluation of sport preferences.

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### 1. Introduction

Important institutions (Centers for Disease Control and Prevention, 2012; European Commission, 2002; International Society for Physical Activity and Health, 2010; WHO, 2012; and others) have been informing for several years about healthy risks connected with inactive lifestyle on one hand and health benefits of physical activity on the other hand (Warburton, Nicol, & Bredin, 2006). To transfer this knowledge it has been a task for several projects (within the Czech Republic nowadays these are for example European Social Fund projects, like VIPPA, Move into school; campaigns connected with cycling being part of Central Europe programme, a project called “Establishment of a national network for physical activity support”), that address individuals mostly via media or organizing public events. Despite these activities happen, common population does not have sufficient knowledge that would correspond to this problematic area (Bellew, Bauman, & Brown, 2010; Craig & Shelton, 2008; Roth & Stamatakis, 2010). The most important sources and mediators of new and contemporary knowledge are sport educators and coaches. For fast and effective transfer of the most recent scientific (research and theoretical)

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knowledge and usage of corresponding tools and technologies supporting proactive lifestyle in health prevention it is necessary to focus just on these people and continuously improve the quality of their education process. Their education should be dynamic both from content as well as procedural side. The content of the education must constantly reflect the newest knowledge based on research findings whereas procedural frame of education must be transformed so that these new knowledge are inserted appropriately into the education. From this point of view it is necessary to use and search for new models (concepts) that correspond to this criterion – models that reflect or use new knowledge from pedagogy, psychology, computer technologies etc.

Above mentioned studies dealing with health and physical activity knowledge indicate that in the whole complex of new knowledge transfer from theory into praxis within the sphere “physical activity and healthy lifestyle” barriers exist causing considerable latency of transfer. Latency is thus evident already during the education process of sport educators and coaches itself. These so called “problems of theory-praxis transfer” are very well described in the literature (Chvátal et al., 2008; Goodson, 1993). Within the level of education transfer the main source of these obstacles is the relationship between two different discursive communities – scientists and teachers (Chvátal et al., 2008). A solution offered is to bring communities together (Gore & Gitlin, 2004; Christianakis, 2010). It means for example to apply activities where future educators are involved in scientific-research activities during their undergraduate study. This can be described as one of the educational approaches so called evidence-based education. This approach is expected to bring these benefits (Christianakis, 2010): familiarization of future educators with research environment and used procedures, enhancement of their faith into research techniques and methods, increase the competence to understand professional outcomes (mostly texts) and as well as immediate manipulation with new scientific knowledge and their projection into practice or also into own life.

Necessity to redesign contemporary concept of sport educators and coaches professional preparation is evident and should be based on continuity of education and research activity of university workplace whereas at the same time maximal effort must be devoted to creation favorable conditions allowing individual orientation on himself/herself within education process (mainly by strengthening the individual as well as group feedback about the character of lifestyle, the type of physical behaviour, physical fitness, the character and the level of education competencies etc.).

The aim of the study is to assess the feasibility of the concept of professional preparation of sport teachers and instructors that attempts to connect education and research activities with the emphasis on presenting evidence-based knowledge and technologies.

## **2. Methods**

Within seven-year period 670-850 students were included in our international study annually. This study was realized by 13 cooperating faculties from the Czech Republic, Slovak Republic, Poland and U.S.A. Students were within their professional preparation incorporated as the co-operators into research teams of students’ project or participated in the formation and solving model projects (research aim coordinated with educational aims). These projects covered research activities based on monitoring physical activity, self-assessment of physical fitness, evaluation of teaching style in PE lessons and evaluation of sport preferences and the projects’ content was in harmony with curricula of the study programme “physical education and sport”. During working on model projects students apart from being “workers” on the project were also objects of research survey. Within their professional preparation students analyzed individual or group data with the use of specially developed software.

Cooperation of students on the project was designed as a student: 1) was confronted with all phases during solving research project; 2) understood typical limits of the research in the sphere of particular research activity; 3) obtained competencies to manipulate individually with research techniques, devices and software actually used in various research spheres; 4) obtained individual feedback about own position within the group regarding particular project sphere; and 5) understood the meaning and position of this piece of information within existing knowledge which was the main aim of the designed project (to verify this piece).

Inclusion of students into research project was the activity that was part of several study subjects according the content and took place thus through their whole study programme in order to permeate newly acquired experience,

skills and knowledge into the complex of standard content of these subjects. Theoretical basis of student professional preparation based on evidence was so called three-phase model of evidence-based education (Figure 1).

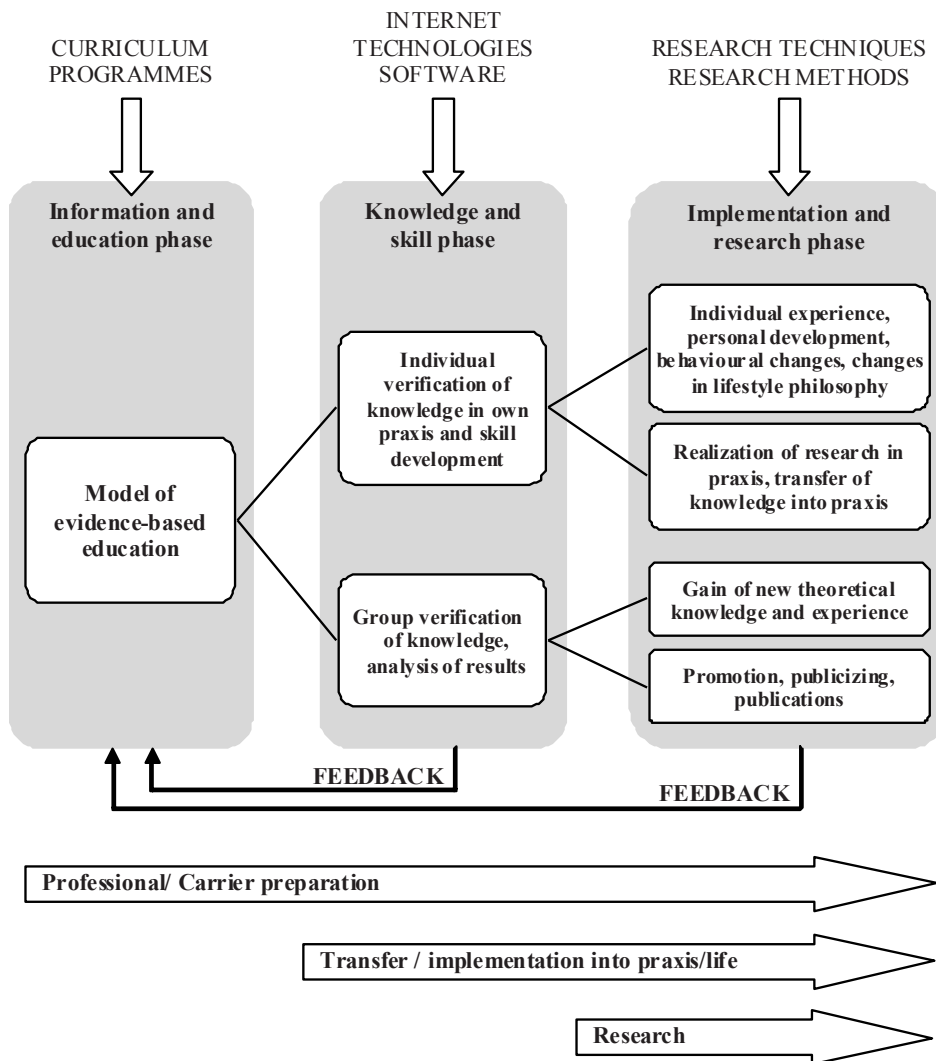


Figure 1. Three-phase model of evidence-based education

### 3. Findings and Results

Within the implementation of presented model of professional preparation the tens of new and research based knowledge were presented to future sport educators covering mainly three spheres: 1. Physical activity (PA) and healthy lifestyle, 2. Health-related fitness) (HRF) and 3. Evaluation of sport education process.

Students participating in the projects focused on the sphere of PA and physical inactivity (PI) monitoring “co-created” knowledge as well as were familiarized with related knowledge that overlapped into the problem of a

healthy lifestyle and changes for proactive physical behaviour. Students verified that boys performed more PA but wearing pedometers decreased the differences not only between boys and girls but also between school days and weekends. On the basis of their own results they become aware that the most critical day from PA point of view is Sunday and on the contrary the most PA is performed on Fridays. They also realized according their individual results that overestimation of the amount of PA exists in the questionnaire survey.

Cooperation in research projects (or model projects) focused on self-assessment of HRF brought students new knowledge mainly from the theory of testing where the main aim was to verify attributes and construction of new field physical fitness tests. Within the context of solving problems (similarly as in previous project field) further implementation of knowledge allowed overlapping into the healthy lifestyle sphere and changes for proactive physical behaviour. In this project, students familiarized in detail with motor test battery focused on HRF both on the level of detailed knowledge of tests and also competency to work with the tests operatively in own praxis. Research realized in cohort of university students allowed deeper cognition of association between HRF on one side and the amount of daily PA, various PA intensity and fundamental somatic parameters on the other side. At the same time they could verify the possibility to use internet platform for promotion of self-assessment of HRF.

Diagnosis of education process during students' practice teaching at schools or in institutions showed significant results. Practicing student-teachers obtained facts about the effectiveness of their own teaching process and the possibility of comparison with other students, already verified facts about the status and trends in education at schools. Students verified that boys prefer PE lessons with high intensity of PA, physically demanding, while girls prefer PE lessons with low intensity of PA which is not true for the lessons with favorite content. Most of the students within their practice verified knowledge of such kind that e.g. boys and girls who are more physically active in PE lessons have got also more daily PA or that boys apart from girls prefer fitness oriented PE lessons.

Apart from the mentioned new and research based knowledge students gained competency to manipulate with tools and to use techniques allowing recording and evaluation of PA and PI (e.g. questionnaire IPAQ long version; pedometer Yamax Digi-Walker SW-701; accelerometer ActiGraph GT1M; ActiTrainer; modules within software Indares.com focused on PA monitoring), self-assessment of physical fitness (newly created battery on-line available field tests contained in an individual module of software Indares.com) together with their implication into education process. Numerous research techniques can be used in common school, medical, commercial or communal praxis. The use of technologies in schools enabled to apply theoretically higher level of thematic and subject integration among biological, geographical, health, PE, informative but also language topics and school subjects.

An important outcome of students' participation in the projects was obtaining their individual as well as group feedbacks. These feedbacks supported not only students' interest within professional preparation but also was directly related to the possibility to influence their own lifestyle with the focus on change of physical behaviour and fitness. Understanding of these links at the same time promoted the following course of further learning in corresponding study subjects with interdisciplinary overlap.

The results from diagnosis of leading education process obtained from students at schools and other institutions allowed immediate intervention into organization of educational process and streamline the own teaching style. Long-term every year evaluation of PE lessons led by student teachers facilitated observation of the trends in student teachers leading their education process and thus improving professional preparation of future sport educators.

In the course of working on the project there was a significant increase of conjoint publications of researchers, teachers and students also in journals from databases.

The important benefit of presented concept was the use of most obtained results as part of evaluation of professional preparation at participated university workplaces.

Limits of the study: Low control of individual motivation and the level of "inner" engagement of individual students into research activities could be one of the limits of our study. Another limit is the latency time between the profit of empirical experience with partial characteristics of research activities and their following application and fixation within the course of study as well as their analysis.

#### **4. Conclusions and Recommendations**

When associating health and physically active lifestyle, the present evidence-based knowledge and the respective technologies directed into praxis can be implemented in the professional preparation of sports professionals. We recommend that more feedback mechanisms on the effectiveness of the transfer process of the evidence-based knowledge are implemented into the model.

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