

The theses of the dissertation

The role of utility and motivation in measuring fitness in physical education in the first post-COVID-19 measurement period

**(The function of background factors influencing the
implementation of the national fitness
measurement)**

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The aim of the dissertation and the determination of the topic

Physical education and sports are an integral part of school education. It is an institutionalised form of personal development which teaches standards of physical activity that enable students to become useful members of society. It is the only practical subject with health as its central theme, with health behaviour and conscious living as its core tasks.

UNESCO, revising the Charter in November 2015, determines universal principles such as gender equality, non-discrimination, and social inclusion through sport and emphasises the philanthropic effects of regular physical activity, the inclusion of people with disabilities and child safety. During the school years, physical education as a subject provides an opportunity to develop these values. It is one of the other subjects with specific literacy content, but here, knowledge transfer appears as a tool in the interaction process.

It is now essential to develop a quality training system that is in line with the existing education policy rules and that

selects and develops professionals with a consistent approach to quality physical education teaching with inclusive elements. It was necessary to draw up a development plan based on well-structured strategies, and a constructive and modern system covering the whole of education and training, which was essential for its implementation in the 2013/2014 school year. The objective of quality physical education was formulated as a task which contributes to the development of health-conscious and future-oriented key competencies for life management of the participating pupils, as well as to a measurable, thus plannable and verifiable system of effects in vocational education, providing the methodological and content framework for this, by the end of the public education phase (TESI 2020).

Work has begun in partnership with the current government, and the T.E.S.I. 2020 project has been launched. After analysing the national and international situation, its task is to define an interdisciplinary roadmap for achieving the environmental conditions necessary for

quality physical education.¹ When the strategy was drawn up, there was no measurement doctrine capable of objectively monitoring the complex impact of physical education (personality, health, fitness).

There have been measurements in schools, but these were chosen autonomously by the school, the most common being the Eurofit, Hungarofit and Arday-Farmosi (1995) measurements. Until 2013, Hungarofit was used in most public schools in Hungary, but its shortcoming is that it was not measured under the same conditions and/or circumstances. It was, therefore, necessary to set up a monitoring system whereby all institutions would be measured using the same instrument, period and rules. A solution was found in creating the National Unified Test of Fitness for Learners (later NETFIT).

The novelty of the system lies in its criterion-oriented nature, while the previous measurement systems

¹ Hungarian National Social Inclusion Strategy II, the Lifelong Learning Policy Framework Strategy, the Public Education Development Strategy and the Medium-Term Strategy against Early School Leaving without Qualifications)

(Hungarofit, Eurofit) were performance-oriented. It measures different fitness components based on a single test system, then analysed on an IT platform. Parents and pupils can access this information, and teachers can access the pupils' data.

The introduction of everyday physical education in 2012 has led to the restructuring, planning and rethinking of the institutional sports infrastructure regarding quantity and quality. The Regional Operational Programmes (ROP) (2010-2014) have already funded targeted interventions in the field of physical education in schools. In 2014, the government announced the National Public Education Infrastructure Development Programme, whose main development profile is the construction of gymnasiums and the development of school swimming pools. Hungary has thus reached another milestone, with the introduction of the NETFIT system on 27 October 2014 within the framework of the T.E.S.I. 2020 project. The measure aims to establish a monitoring system in the Hungarian school system, which can improve pupils' health and serve the objectives of the T.E.S.I. 2020 strategy. However, the main aim is to develop a system capable of monitoring the

development of key competencies related to health-conscious and future-oriented life management. Education is one of the main sites for acquiring and developing key competencies, so there are already sub-modules in the education system that support lifelong learning. The NETFIT measure zonal classifications are available to all but are difficult to monitor, as only the health zone, development needed, and enhanced development needed zone results are visible as the result of performance.

The Hungarian Diákspport Szövetség (MDSZ) has prepared the T.E.S.I. 2020 planning document (Green Paper), taking into account the results of the international and national situation analysis, in line with the EU budget period 2014-2020 and the development policy planning period, about the Recommendation of the Council of the European Union on the cross-sectoral promotion of health-enhancing physical activity (Council Recommendation on the cross-sectoral promotion of health-enhancing physical activity 2013/C 354/01).

It focuses on the necessary procedures and the optimal management of the challenges to be faced, thus creating a quality education system for physical education. The

Council of the European Union, based on the document on the cross-sectoral promotion of healthy physical activity, adopted recommendations on the development of sport and public health on a proposal from the Commission, and the Agreement states that the Commission should support any initiative in the field of public health which promotes policy coordination between Member States, ensures periodic reviews and evaluations, helps to define indicators². The immediate focus of the Recommendation is to promote health-enhancing physical activity within Member States, establish a policy monitoring system and promote cooperation between Member States, which means policy coordination (European Commission, Brussels, 28.08.2013³). In Hungary, there has not been a study on the extrinsic and intrinsic factors of NETFIT outcomes until the writing of this research. In my dissertation, I attempted to identify the motivations that

² Consolidated version of the Treaty on the Functioning of the European Union - Part Three: the Union's internal policies and activities - Title XIV: Public health - Article 168 (ex Article 152 TEU)

³ COUNCIL RECOMMENDATION on the cross-sectoral promotion of healthy physical activity

influence the implementation of NETFIT measurements and to determine the factors that contribute to the perception of the usefulness of the measurements, thus helping to interpret and improve the resulting product.

The relevance of the dissertation is also predicted by the fact that the coronavirus epidemic hit Hungary on 4 March 2020, which was declared a pandemic by the World Health Organization (WHO) on 20 January 2020. It outlined immediate action plans, including the transition of pupils and students in educational institutions to digital education and preparing the health sector for epidemic preparedness. The population has been "quarantined" from 28 March to 11 April 2020, to protect their health. Individual recreational sports activities were the only sports that could be practised during that period (Ács et al., 2020). On 18 June 2020, the state of emergency was lifted, but the state of alert remained in place. During the COVID-19 pandemic, public health guidelines and government regulations resulted in considerable restrictions on daily life, including social distancing and confinement to the home (Ammar et al., 2020). Teaching physical education

in the context of physical activity as a subject made it more difficult to teach. The focus of my research was on the factors influencing the implementation of physical education and, within that, the NETFIT measurement. Thus, I attempted to map the period before and after the pandemic by analysing student surveys and statistical data.

Applied methods

Before the main study, three preliminary studies were conducted, which I built up systematically in order to verify my research. This research was necessary to get a comprehensive picture of the evolution of NETFIT results, where I did not perceive the zone results as a primary indicator but as a result of the factors that influence the variables that affect implementation.

In the first pilot study, I drew conclusions from the results of the 2016 Youth Study Hungary on the sport and leisure activities and health behaviour of 15-18-year-old students. I compared the development of NETFIT results with this information. The second secondary research was necessary to rule out the lack of NETFIT measurement in practical training and to find out the opinions of sports

professionals (n=21) from universities in Hungary on the usefulness, integrity and adequacy of the tests. I also consider this a dominant point in the research analysed in the empirical part of my dissertation. Nothing could explain the need for a third preliminary research better than the pandemic that slowed down the world for two school years and its impact. The survey was necessary because the NETFIT measurement was suspended during this period due to the situation. Thus, there was no feedback on the students' physical activity or even inactivity. My research for this thesis was based on a quantitative method, and data was collected by simple random sampling using an online questionnaire. The questionnaires were sent to secondary school physical education teachers in Pest County, who assisted me in completing the questionnaires, which was voluntary on the part of the students. The total number of pupils in the schools was 8000. A simple random sampling was done with every 10th pupil completing it. The sample is not representative, and therefore, it can be stated that it is not representative of the whole secondary school population in Pest County. Parental consent forms were completed by

students under 18 years of age, and a guide for teachers was sent out. The questionnaire was sent out in April 2022 and closed in November 2022. The questionnaire was designed to test teachers' knowledge of the NETFIT measurement, the circumstances of its implementation, the impact of factors influencing the motivation to implement the measurement, and its perceived usefulness. The data were analysed along with the research questions, and statistical analyses were conducted using SPSS 22 statistical software. I computed basic statistics (mean, standard deviation) and performed rank correlation, cross-tabulation analysis, factor analysis, hierarchical cluster analysis, Mann-Whitney U, Kolmogorov-Smirnov test, Kruskal-Wallis test and logistic regression to examine correlations.

Results

In my first hypothesis, I hypothesised a decrease in the zonal classification between the results of the pre-retraining measurement before the transition to digital and the first measurement after the return to in-person training for the following tests (push-up exercises, the abdominal

exercises, the shuttle test, the body fat percentage and body mass). My hypothesis was confirmed for at least one zonal classification. I created three clusters: improving students, unchanged students and deteriorating students. The improving students showed a minimal but improving trend in four tests; the unchanged students scored the same in all tests in the pre-closure period as in the post-closing period. The deteriorating students scored worse on all tests. Among the clusters, the pendulum test scores also worsened among the improving students ($M=0.282$, $SD=0.908$), not only among the deteriorating students ($M=0.4865$, $SD=0.651$). Thus, it can be said that the pendulum test scores were significantly affected by the sedentary period, which implies that even the same amount of nutrient intake can lead to weight gain, fitness deterioration, and an increase in BMI and body fat percentage.

In my hypothesis, I do not prove a decrease in the number of hours taught due to evidence, I do not find a significant relationship between lesson topic and hours taught in the sample, and the number of hours taught in digital work

does not have a positive effect on the number of students in the health zone and those in the three zones with increased development needs. It can be said that NETFIT scores in the Central Hungary region were largely unaffected by two years of decline in physical activity among students except in the test measuring aerobic capacity. Significant correlations were found in three cases when comparing zone results and physical activity. Between those who played sports competitively, those who played sports at least three times a week outside PE lessons and those who played sports only in PE lessons. In all three cases, the highest proportions were in the health zone, but in all three cases, the second highest proportions were in the development-needed zone for the three tests.

I could prove the **second hypothesis** that the teacher motivates students to use the data using NETFIT data. Students consider measurements useful when the teacher uses the results to improve them. In all cases, the mention of inaccuracy of measurements is high. When the teacher develops the students on this basis, students do not consider NETFIT as an appropriate measurement method;

they use other more complex measurements to monitor their condition, heart rate measurement and other sport-specific measurements mentioned in the open-ended questions. In all cases, the accuracy of school-based measurements, i.e., NETFIT, was the least frequently mentioned. It can be said that the teacher's attitude towards the NETFIT system, i.e. the use of the data obtained, is an influential factor in the student's perception of the usefulness of the measurement. The answers to the questions are the students' responses, so the students' comments determined the teacher's use, differentiation or methodological incorporation of the results. The results of my hypothesis support the research findings of Révész (2021) that teacher attitude and differentiation can be a component of effective physical education teaching.

I was able to prove the **third hypothesis**, that it is the measures for which students get marks that become important. NETFIT's policy states that it is inappropriate to grade tests, but to "motivate" students to perform and not to perform at the minimum level, grading as a motivating agent is linked to practice. In cases where

teachers assess performance, assessment makes sense for students. It can be argued that grading is intrinsic to school life because it is a measure of students' 'knowledge'. The process of grading is related to the student's attitude to learning. Students may be assessed by points, numbers, marks, and textual assessment, but these complement each other to achieve the overall assessment. The grade chosen should reflect the differences in knowledge/skills, i.e. it should be characterised by objectivity, reliability, and validity. The assessment can be used to motivate learners, provide feedback to the participants in the learning process, whether they are learners or teachers, differentiate between learners, coordinate the learning process, and administer performance. The time and criteria for grading should be known to the learner (Czédliné., 2011; Cziberéné & Nohel, 2013).

In my **fourth hypothesis**, I hypothesised that parental educational attainment would influence perceptions of the importance of physical education and academic achievement, allowing me to identify it as an important agent in implementing NETFIT, and I verified this

hypothesis. Parents' perception of physical education also influences their perception of NETFIT. The highest proportion of students with "good and excellent" academic results is among parents with at least a high school diploma. However, among those with 'good' academic results, the children of parents with a school-leaving certificate are the ones who consider the measurements useful for both parents, as is the case for motivated pupils. The children of parents with university degrees account for the largest proportion of those who consider the assessments less useful and unmotivated learners. However, a difference is already apparent when looking at the 'A' students. For both the father and mother, where the parents' highest educational attainment is university or college, motivated to perform are pupils with a mean of 4.51-4.99.

I verified the **fifth hypothesis**, which is how the motivational factors influencing the implementation of the NETFIT measurement and the perception of the usefulness of NETFIT are determined by different factors. "Positive" perceptions of usefulness are influenced by the

time of measurement (end of year and during the year), the mother's educational level (vocational school, university/college), if physical education is important to parents, and if physical education as a subject is important to the student. It is also positive if the teacher does not differentiate on this basis. Pupils who also play sports outside PE lessons, those who question the accuracy of measurements and those who use more complex measurements had a negative perception of the usefulness of NETFIT.

Among the motivating factors that positively influence NETFIT implementation are the users of the NETFIT app. The app allows for instant feedback. After the assessment, the student takes the data using his/her mobile phone and sends it to the teacher who conducts the assessment (thus facilitating the teacher's work), who validates the data so that both the student and the teacher keep the data and can see the student's zone assessment. The triggering of positive motivation is further influenced if longer measurements are not taken during the measurement period (a shuttle run or a timed abdominal test can be

considered longer) or if the school measurements are considered accurate; physical education as a class is important to the respondent. In terms of motivation, those who find the measurement of body composition and nutritional profile important will be more motivated to perform the same way as those who receive a grade for some tests. Students who use other measurements in PE lessons, who do not know their scores and therefore do not know whether their PE teacher is improving them based on it, and students who always measure a different trial (i.e. not all trials are measured in the NETFIT assessment) will be unmotivated in implementation. I found three factors that also play a role in the development of usefulness and motivation: those who consider the NETFIT measurement a good starting point for sport, those who consider the primary measurements important (previously established factor includes endurance shuttle, push-up, abdominal exercises) and those who consider the secondary measurements important (previously established factor includes measuring hand grip strength, flexibility, stationary long jump, deadlift). An additional questionnaire was used to define utility. On this basis, it

became clear that the assessment of the performance of the measurements in terms of utility could be divided into two parts. One part is long-term utility, with interpretations linked to health and well-being, and the other is short-term utility, with immediate results linked to the performance.

As a suggestion, the possibility of setting up a national ranking (as in the case of the competency test) should be mentioned, which would encourage physical education teachers, who are encouraged by the school management. However, the risk of this lies in the actual measurements taken, the result of which would also solve the possibility of tests not being taken. Such a solution would be to allow the results to be used as an extra point in the admission score for further study in physical education or for universities where the sport is important or there are sports-related classes, but this would not be sufficient for one year of completion in a health zone (minimum four years) and would require more teacher-certified score sheets. One of the simplest ways to do this is to introduce an educational policy that requires a physical education teacher qualification, which would make it possible to

ensure the accuracy and professionalism of the measurement, as physical education teachers have mastered certain areas during their training and thus know the cause-and-effect relationships. Universities should emphasise integrating it into the curriculum and not just treating it as supplementary information in the professional training since it will be compulsory for outgoing PE teachers to carry out and evaluate the results uniformly and regularly every year.

Hungary has been a pioneer in Europe by developing a standardised measurement system and introducing daily physical education. To use it effectively and accurately reflect the fitness status of today's young people, it is necessary to develop a partnership with the students taking part in the survey to consider their views and the motivational factors needed for implementation. In this way, it will imply a locking information on which sports professionals can start to develop their pupils.



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List of publications related to the dissertation

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