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Theses of the doctoral dissertation

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**A complex study of career and learning motivation and sport
engagement of undergraduate physical education students**

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1. Introduction

As a former professional athlete, my work is driven by my passion for sport and my commitment to delivering quality through continuous professional development. I find that little diagnostic research has been conducted on the changes in the career plans of teacher trainees from the start of their education to their arrival in the workplace, which has reinforced in me the need for research in this area. Based on my experience as a teacher educator, I believe that the emergence of educational activities during training is a significant milestone in career choices, as these experiences have a major impact on students' career motivations and career plans. Family and friends play an important role in the choice of a teaching career (Ms. Kovács, 2007), as well as the desire to build a better society (Martin, 2007). These factors determine students' commitment and motivation to pursue a teaching career, which also confirms the importance of our research in this area. Methodological approaches are needed that take into account the whole pathway from entry to physical education teacher education, including the phase when novice teachers are in a sense 'in transit', when they enter a new workplace and socialise into the world of education. The process of choosing a career is a highly complex and dynamic one, in which individuals choose a professional direction on the basis of their previous experience, their existing skills and their ongoing development. According to Super and Nevil (1984), an individual's self-concept has a significant influence not only on career choice but also on subsequent career satisfaction. Preparation for the teaching profession consists of several stages, as exemplified by the *Flying Start* programme presented by the OECD (2019), which emphasises lifelong learning for teachers, selecting and training the most suitable candidates, and supporting new entrants. István Szabó (1994) describes the process of career socialisation in four stages: commitment, professional training, career entry and awareness of the advantages and disadvantages of the career. In her studies, Margit Dudás (2000) focuses on students' entry views and their analysis and evaluation, which helps to develop the self-awareness and professional identity of students preparing for a career as a teacher. Pinczésné's results show that first-year students base their interest in the profession on their previous experiences along general motives, while senior students are characterised by specific motives based on experiential knowledge of the teaching profession (Pinczésné, 2019). The process of becoming a teacher is not limited to university education, but is a lifelong learning and developmental journey. A study by Iván Falus (2007) divides teacher education into three phases: past experience, integration of theoretical and practical training, and the development of a professional profile. However, as Hascher and Winkler (2017) note, a lack of alignment between professional training and practical experience can reduce the chances of entering a teaching career, especially in theory-centred education systems. According to Orgoványi-Gajdos' research, mentor teachers point out that there is a lack of full alignment between subject theoretical knowledge and teaching skills in public education, with a significant knowledge gap in subject pedagogy in particular, exacerbated by the fact that the timing of university education means that students are already teaching before they have completed the required subject methodology courses (Orgoványi-Gajdos, 2019). Creating a supportive learning climate that prevents emotional exhaustion and ensures well-being is essential for the professional and personal development of teacher candidates (Dicke et al., The new system of teacher education in Hungary, which will come into force in 2022, aims to address this need by

providing students with an insight into teaching from their first year (K. Nagy, 2019). The lack of coherence between different theories and practices of career socialisation, as well as differences in individual life trajectories, may influence the degree of professional alienation of teacher candidates, which may reduce interest and commitment to the profession (Spencer-Cavaliere & Rintoul, 2012). Therefore, it is essential to continuously assess the professional attitudes of teacher candidates and their degree of alienation, with a particular focus on gender and grade differences. Chrappán (2012), examining satisfaction with the teaching profession and its motivational factors, pointed out that differences between student teachers vary by subject. The uniqueness of the physical education teacher subject is that it emphasises a similar proportion of theoretical knowledge and practical knowledge, in order to achieve a high level of quality in physical education. Therefore, the impressions gained in the PE teaching profession equip students with a different type of knowledge and a different perception of the diversity of the teaching profession compared to other professions. The perception of a teacher is a perception of a teaching career based on past experiences (Hurtik-Tóth, 2021). These experiences strongly influence the prospective teacher's teaching role, teaching methods, decisions and evaluation system. In order to bridge the gap between prior and new knowledge in a strong way, different starting strategies are used at different stages of the training in order to reach a skill level. Different elements of self-regulation inform how learners manage the learning process, which includes planning, monitoring, focusing, reflecting, and evaluating (Weinstein & Acee 2013). Self-regulated learning involves awareness of factors that influence learning outcomes, reflecting on one's own progress, and monitoring different learning factors (Panadero, 2017). According to Pintrich (2000), the effective use of learning strategies not only contributes to improved academic outcomes, but also directly influences students' future career motivation and career planning (Pintrich, 2000). Monitoring and evaluating performance in different academic fields of higher education can provide constant feedback on changes in student performance. Besides knowledge performance, the performance of students in their chosen sport plays a significant role in their personal development and identity formation due to the specificity of the degree programme (Alzyoud & Melhim, 2017). In a study conducted in 2022, Mahmoud et al. concluded that playing sport has a positive effect on improving the components of athlete identity among physical education students. Looking at the grade level, the researcher also found that the further a student progresses in his/her studies in physical education, the higher the level of athlete identity (Mahmoud et. al., Preparation for a career as a physical education teacher therefore requires not only the integration of theoretical and practical knowledge, but also the development of a commitment to sport and motivation to learn. Such a complex approach will ensure that students effectively develop their own sense of vocation during career socialisation and are able to maximise the link between sport and education for the development of their students.

2. Research aims

In this study, I investigate the views of undergraduate physical education teachers on career, learning and sport motivation and their evolution as they progress through their studies as physical education teachers

The aim of the research is to explore the factors that reinforce or discourage the choice of a teaching career (e.g. academic results, attendance, teaching experiences) and the factors that help the transition to a teaching career after graduation (e.g. perceptions and practices related to the role of a teacher). I will also investigate the motivation and perceptions of career choices and perceptions of the teaching profession by grade and gender. I also investigate commitment to sport as a characteristic of a career as a physical education teacher.

Our objectives for career motivation are:

One of the aims of my doctoral dissertation is to find out how attitudes towards teaching are influenced by the professional theory and practice courses and teaching practice courses (observation, micro-teaching) in different grades. I would like to explore where a sharp difference first emerges in terms of future career orientation and which and what type of courses are decisive in terms of progression in studies. During higher education, the social interaction with fellow students, the personality of the lecturers, the difficulties of the subjects, can override previously held views.

My objectives in relation to motivation to learn are:

Our aim is to identify the factors that contribute to and influence the effectiveness of academic learning and their importance in the process of teacher education. In doing so, I will examine effective techniques of university learning, the impact of student workload (number, nature and content of units) and changes in career motivation on learning motivation.

I also track changes in motivation to learn by grade and gender. My aim is to identify the grades in which more people are hesitant about choosing the right profession for academic reasons. At the same time, I aim to identify the specificities underlying their learning difficulties. Identifying the groups experiencing difficulties and the difficulties in the learning process provides an opportunity to understand the causes of negative perceptions of the teaching profession and to identify and reinforce the positive factors that keep them in the profession.

Objectives relating to commitment to sport:

Our aim is to find out how their love of sport, their own sporting experience and their sporting history influenced their choice of a career in physical education. I will also investigate how their motivation for sport changes during the course of their teacher training. I also want to get a picture of this at the level of sport (individual or team), grade and gender.

In this research, I am looking for a relationship between motivation to learn, motivation to become a teacher and commitment to sport in the following questions:

- a.) those whose motivation to become teachers increased, did their motivation to learn also increase?
- b.) for those whose motivation to become a teacher increased, how did their motivation for sport change (increase or decrease)?

3. Hypotheses

At the beginning of the research, the following hypotheses were formulated:

- H1: Kozma considers the period of probation and examination teaching as an important turning point in teacher education, where teacher identity is best developed (Kozma, 2004). Based on this, we hypothesise that the motivation of student teachers of physical education undergoes a significant positive change in the third year of their perception of a teaching career, when they start micro-teaching.
- H2: It is hypothesized that physical education students become more stressed as a result of the preparation for micro-teaching and the attendance in the third year of their studies, with two likely outcomes: increased stress levels lead to adaptive coping and task performance in a group of students. For others, this extra workload is associated with higher anxiety, leading to maladaptive coping.
- H3: We hypothesise that as students progress in their studies, they will increasingly perceive the difficulties of a teaching career, which may lead to a reconsideration of their previous decision to choose a teaching career, especially for male students.
- H4: We hypothesize that gender differences in learning routines and techniques will be found for motivation, learning aids, and study-related anxiety.
- H5: It is hypothesized that physical education students who participate in team sports will be more committed to their sport than their individual sport peers throughout the entire period of their training, as a result of the social experiences they have had in their sport. Our hypothesis is based on the results of Pikó's research among high school athletes, which found that due to the community atmosphere, team athletes are more attached to their sport and more committed to their sporting activities (Berki & Pikó, 2020)
- H6: The more advanced one is in their studies, the less motivated they are towards regular (competitive) sport (e.g. Szemes, Harsányi and Tóth, 2016), and the more workload they have to carry with their studies, the more they focus their efforts on their teaching career and the less they think about being an active athlete. Based on the above, we hypothesise that a strong athlete identity (commitment to sport) in the upper grades decreases in parallel with the increase in physical education teacher identity.

4. Methods

- A self-designed questionnaire asking for demographic data (Annex 2).
- To explore the motivational factors associated with teacher/educator career choice, we used the Factors Influencing Teaching Choice Scale - FIT-Choice Scale validated questionnaire (Watt & Richardson, 2007) (Appendix 4). The test measures two different constructs along eighteen factors, comprising fifty-seven items. Twelve subscales contain questions related to teacher-educator career motivation and six subscales, perceptions of teacher-educator career (previous teaching/learning experience, social influence, expertise, difficulty, social status and salary). Respondents can rate their level of agreement or disagreement with aspects representing each factor on a seven-point scale.
- The students' attitudes towards learning were assessed using the LASSI (Learning and Study Strategies Inventory) questionnaire (Weinstein & Palmer, 1987; Olaussen & Bråten 1998). The items were rated by the students on a five-point Likert scale. The questionnaire has 10 subscales with 77 items, which are: attitude, motivation, time management, anxiety, concentration, information processing, selection of main ideas,

study aids, self-testing, test strategies. The model includes task values, the components of which are intrinsic value, social utility. The original version contains 77 questions divided into 10 subscales: attitude, motivation, time management, anxiety, concentration, information processing, selection of main ideas, learning aids, self-testing, test strategies.

- Commitment to sport was measured with the so-called "Sport Commitment Questionnaire 2" developed by Scanlan et al. (2016), translated and adapted into Hungarian (Berki, T. & Pikó, B. 2017). The scale consists of 58 items and 12 subscales, where respondents have to answer on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree). The 12 subscales measure two types of engagement (enthusiastic engagement and forced engagement) and ten hypothesised sources of engagement. Sources include, for example: enjoyment of sport, valuable opportunities, other priorities, personal investment (quantity and loss), community pressure, and emotional and informal community support.

5. Data processing

Statistical analyses were performed using IBM SPSS Statistics for Windows, Version 25.0 (IBM Corp. Released 2017. Armonk, NY: IBM Corp.). The data were processed taking into account the different subscales of the questionnaires, which are described in detail in the evaluation of each questionnaire. Since the groups have different item counts, robust procedures were used.

5.1. How the Fit-Choice questionnaire is processed

We calculated means and standard deviations, and the results of our analysis by year group and gender were tested using multivariate analysis of variance. To appropriately limit the possibility of committing a first-order error ($\alpha = 0.05$), we applied a Bonferroni correction to the two superscales, accepting as statistically significant the result where $p < 0.004$ for teacher career motivation and $p < 0.008$ for teacher career perception. Analyses by gender and grade were conducted in a multivariate analysis of variance model. This examined the main effect of gender and year group and the gender x year group interaction, with the partial year-squared as the effect size measure.

5.2. How the LASSI questionnaire is processed

Mean and standard deviation data and frequency data are included as descriptive statistical indicators. Since the LASSI test measures the same constant on 10 different subscales, a Bonferroni correction ($\alpha = 0.05$) was applied to properly limit the commission of the first-order error, so that the result where $p < 0.005$ was accepted as statistically significant. Differences between the six year groups were tested using one-tailed analysis of variance. In addition, we used multivariate analysis of variance to examine the main effect of gender and year group and gender x year group interactions, with the partial year-squared as the effect size measure. To examine the relationship between LASSI and academic achievement, we conducted correlation analysis by gender and grade.

5.3. How the sports commitment questionnaire is processed

Mean and standard deviation data and frequency data are included as descriptive statistical indicators. Since the Sport Commitment Questionnaire test measures the same constant on 12 different subscales, a Bonferroni correction was applied to properly limit the possibility of committing a first-order error, so that the result where $p < 0.004$ was accepted as statistically significant. Differences between the six year groups were tested using one-tailed analysis of variance. In addition, we used multivariate analysis of variance to examine the main effect of gender and year group and gender x year group interactions, with the partial eta-squared as the effect size measure. Analysis by type of sport was performed using an independent samples T-test.

5.4. How the Teaching, Learning and Sport Commitment Questionnaire is processed

The final part of our research was to explore the correlations between the three questionnaires used in the dissertation, using a cross-tabulation analysis. In our analysis we also looked for relationships between different motivations in relation to gender and grade. For the correlation tests, similar to the very strict statistical validity criteria of the other analyses, only correlations where $p < 0.05$ and a relationship of at least medium strength (above 0.5) between the variables were considered suitable for analysis.

6. Findings

In terms of career motivation, we found that female students were more motivated to become teachers than male students. Among the year groups, third-year students showed the highest career motivation, while first and fourth-year students showed lower motivation. This year, students are increasingly valuing teaching as a career, which becomes particularly prominent in the period of co-education. Third-year students begin to understand the process of teaching in more detail and are able to store mechanisms for good decisions and actions that they can recall in similar situations later. The correlation between information processing and teacher perception is also significant, indicating that students are becoming increasingly aware of the value and importance of the profession. However, instead of the pleasant atmosphere of peer teaching in the third year, there is a sharp change in the fourth year. It is likely that the pressures of a teaching role in a real educational setting are putting students under such pressure that positive thinking about a career in teaching is faltering.

There were also significant differences in the perception of the career path between grades, with third-year students being the most positive and fourth-year students the least positive. However, there were no significant differences in career perceptions by gender.

In a gender comparison of motivation to learn, female students generally scored higher in the use of learning strategies, particularly in the areas of information processing, time management and concentration. For male students, results were less homogeneous and showed lower levels of motivation in some areas. When examining the relationship between academic achievement and learning strategies, the results suggest that students who achieved higher academic averages were more likely to use effective learning strategies, such as appropriate time management and information processing. The results also revealed that factors influencing motivation to learn, such as the use of test strategies and study aids, varied by grade level. In the lower grades, these strategies played a greater role in successful learning.

There was no significant difference between the commitment to sport and the sporting identity of PE students across the university years. Based on the analyses performed, there were no significant changes in students' commitment to sport, neither between genders nor between years. The data suggest that sporting commitment does not decrease as university studies progress and that students retain their original sporting identity regardless of whether they are preparing for a teaching career. This may be due to the fact that students' passion and commitment to sport is established before they start their studies and remains stable throughout their university years.

7. Proving hypotheses

- Our first hypothesis, that the motivation of students in physical education teacher education undergoes a significant positive change in the third year of their perception of a teaching career, when they start micro-teaching, was confirmed. To get around this issue, the super-factors and sub-factors of the FIT-Choice questionnaire were analysed by year group. My results are consistent with Kozma's research findings. Indeed, the period related to teaching is the most pronounced period of teacher identity, which is supported by the results of the third-year student's career motivation (Kozma, 2004).
- Our second hypothesis is that students in physical education become more stressed as a result of the preparation for micro-teaching and the attendance in the third year of their studies, with two likely outcomes: increased stress levels lead to adaptive coping and task performance in a group of students. For others, this extra workload is associated with higher anxiety, leading to maladaptive coping, partly confirmed as third-year students study using an adaptive coping strategy. Our hypothesis is based on Weinstein's (1994) research findings that students have overconfidence and optimism about their own abilities and perceive the extra burden of preparation by experiencing the complexity and variety of training. We collected data on how the additional tasks of public education courses and foundational exercises that appear in the third year affect the student. To prove our hypothesis, I used the LASSI questionnaire by year. The positive atmosphere in the group created a supportive environment that, although it was a new role for the students, did not put too much pressure on them.
- Our third hypothesis that, as students progress in their studies, they will increasingly perceive the difficulties of a teaching career, which may lead to a reconsideration of their earlier decision to choose a teaching career, especially for male students, was confirmed. We sought to answer our hypothesis by analysing the FIT-Choice questionnaire by gender. The depth of personal interests and desires related to a career in teaching and, the objectives of making a positive impact on society are more specific to women than men. In contrast, men responded with negative feedback on their belief in their teaching abilities and their choice of profession.
- Our fourth hypothesis, that there would be gender differences in learning routines and techniques with respect to motivation, study aids, and study-related anxiety, was only partially confirmed by a gender analysis of the LASSI questionnaire. Based on our results, no differences in motivation to learn were found. However, female students make more frequent use of technical tools to support their learning, suggesting that they invest more energy in improving their learning efficiency, which is often associated with increased anxiety. Although women make better use of learning support tools than men, we found no significant motivational differences between the two genders in terms of professional engagement in our research.

- Our fifth hypothesis is that students who participate in team sports will be more committed to their sport than their individual counterparts throughout the entire training period, due to the social experiences they have in their sport. We based our hypothesis on the results of Pikó's research among high school students who participate in sports, which showed that due to the community atmosphere, team athletes are more attached to their sport and more committed to their sport activities (Berki & Pikó, 2020). For our analysis, we conducted a team analysis of the SCQ questionnaire. We believe that team athletes are not only responsible for their own performance, but also try to perform well as an element of a system in order to achieve results. In addition, competition for positions is also a common phenomenon in team sports, which may encourage athletes to train with more commitment and perseverance in order to compete regularly.
- Our sixth hypothesis, that a strong athlete identity (commitment to sport) in the upper grades decreases in parallel with an increase in physical education teacher identity, was not confirmed. To confirm our hypothesis, we conducted a correlation analysis between FIT-Choice teacher career motivation and sport commitment. The analyses showed no significant change in students' commitment to sport, neither between genders nor between grades. As university studies progress, sport engagement does not decrease and students maintain their original sport identity regardless of whether they are preparing for a teaching career. This may be due to the fact that students' passion and commitment to sport is already established before they start their studies and remains stable throughout their university years. The findings of Szemes (2016) on the negative association between physical education teacher and athlete identity could not be confirmed.

8. Summary

In terms of career motivation, we found that female students were more motivated to become teachers than male students. Among the year groups, third year students showed the highest career motivation, while first and fourth year students showed the lowest. This year, students are increasingly valuing teaching as a career, which becomes particularly prominent in the period of co-education. Third-year students begin to understand the process of teaching in more detail and are able to store mechanisms for good decisions and actions that they can recall in similar situations later. The correlation between information processing and teacher perception is also significant, indicating that students are becoming increasingly aware of the value and importance of the profession. However, instead of the pleasant atmosphere of peer teaching in the third year, there is a sharp change in the fourth year. It is likely that the pressures of a teaching role in a real educational setting are putting students under such pressure that positive thinking about a career in teaching is faltering.

There were also significant differences in the perception of the career path between grades, with third-year students being the most positive and fourth-year students the least positive. However, there were no significant differences in career perceptions by gender.

In a gender comparison of motivation to learn, female students generally scored higher in the use of learning strategies, particularly in the areas of information processing, time management and concentration. For male students, results were less homogeneous and showed lower levels of motivation in some areas. When examining the relationship between academic achievement and learning strategies, the results suggest that students who achieved higher academic averages were more likely to use effective learning strategies, such as appropriate time management and information processing. The results also revealed that factors influencing motivation to learn, such as the use of test strategies and study aids, varied by grade level. In the lower grades, these strategies played a greater role in successful learning.

There was no significant difference between the commitment to sport and the identity as a sportsperson of physical education teacher students during their university years. Based on the analyses performed, there were no significant changes in students' commitment to sport, neither between genders nor between years. The data suggest that sporting commitment does not decrease as university studies progress and that students retain their original sporting identity regardless of whether they are preparing for a teaching career. This may be due to the fact that students' passion and commitment to sport is established before they start their studies and remains stable throughout their university years.

9. Limitations of research

Our study has limitations, so the results should be interpreted with caution when considering their external validity.

The research was cross-sectional in nature, so it was not possible to make any findings on tracking process change.

Our research was limited to a sample of students from two educational institutions, with different numbers of students in each year group. Due to the disproportionate participation between the grades, we used a robust procedure that measures more accurately when homogeneity of variance is not met. In addition, to limit the possibility of committing a first-order error, we applied a Bonferroni correction, i.e. the significance level associated with each subscale was tightened. The initially chosen significance level was divided by the number of subscales.

The research is based on questionnaires, and its subjectivity is a potential source of bias. As our analysis focused on a specific issue, such as sport engagement in teacher education, this may indeed narrow the general interpretation of the results to other areas. In terms of interdisciplinary approach, we have taken the perspective of the disciplines of education and sociology, and have not focused on a psychology-based approach to student attitudes.

10. New research findings

- The research is important because it is the first time that an analysis has been carried out on learning, teaching and sport engagement, each of these three areas separately and then in a complex way. These results are important because they provide a better understanding of the periods of change in student performance, making it easier for teachers to reflect on these situations.
- This novel approach to research, based on the interaction between three different areas of the current part-time physical education teacher training in Hungary, was the first of its kind in our research. Our results can provide guidance for researchers to gain a more complex picture of how gender and grade interact in relation to learning motivation, career commitment and sport commitment. This may help to identify specific situations or periods where certain groups (e.g. male students in their fourth year) may need specific support.

- The research sheds new light on the second phase of Falus' 3-phase career socialisation model, examining it in detail, looking for the points in teacher education that have a positive or negative impact on students' career perception.
- The results of the research show that the elements of teacher education related to practical teaching reinforce career choice and positively shape career socialisation. Our results can help us understand how test and examination teaching is an important turning point in students' lives.
- For the first time, a study has been conducted to explore the relationship between sport and sport engagement of undergraduate physical education students.
- For practice-oriented teacher education (physical education teacher), we propose a multi-stage structure for the continuous positive development of the student's career concept. Possible stages could be: - peer teaching, - tutoring, - more informal general education/professional teaching (e.g. day care, coaching), - general education micro-teaching, - general education classroom.

11. Literature

1. Alzyoud, K. M., & Bny Melhim, M. B. (2017). The Importance of Sports Activities in Improving Social Relationships between Students at the Faculty of Physical Education in Yarmouk University. *Journal of Educational & Psychological Sciences*, 18(04), 327-355. <http://dx.doi.org/10.12785/JEPS/180411>
2. Berki, T., & Piko, B. F. (2017). Hungarian adaptation and psychological correlates of Source of Enjoyment in Youth Sport Questionnaire among high school students. *Cognition, Brain, Behavior*, 21(4), 215-235.
3. Berki, T., & Píró, B. (2020). The relationship between athlete identity and sport commitment among adolescent athletes. *Educational Science/ Education-Research-Innovation*, 8(3), 18-31. <https://doi.org/10.21549/NTNY.30.2020.3.2>
4. Chrappán, M. (2012). Satisfaction and mobility opportunities among teacher education graduates. In *Garai O. & Veroszta Zs. (Eds.): Educatio Társadalmi Szolgáltató Nonprofit Kft., Budapest. 267-286.*
5. Dicke, T., Holzberger, D., Kunina-Habenicht, O., Linninger, C., Schulze-Stocker, F., Seidel, T., ... & Kunter, M. (2016). "Double reality shock" when becoming a teacher? The development and potential influencing factors of emotional exhaustion during teacher induction time, and after having worked as fully licensed teacher. *Psychology in Education*, 244-257. <http://dx.doi.org/10.2378/peu2016.art20d>
6. Dudás, M. (2000). The possibilities of helping career socialization in the initial phase of teacher training. *Teacher Education*. 1-2. 84-99.
7. Falus, I. (2007). The process of becoming a teacher. *Gondolat Publishing House, Budapest.*
8. Hascher, T., & Moser, P. (2001). supervised practicum requirements for practicum teachers. *BzL Contributions to Teacher Education*, 19(2), 217-231. <https://doi.org/10.36950/bzl.19.2.2001.10296>
9. Hürtik-Tóth, E. (2021). Examining the commitment of physical education students to a teaching career. *Teacher Education*, 20(3), 29-53. <https://doi.org/10.37205/TEL-hun.2021.3.02>
10. Kozma, T. (2004). Who owns the university? Új Mandátum, Budapest.

11. Kovácsné T. Á. (2007). Value systems of career choice motivation among graduate nursing and teacher training college students. Doctoral dissertation. Manuscript. Semmelweis University, Budapest
12. K. Nagy, E. (2019). The practice orientation of teacher education at Stanford University. *Teacher Education*, 18. no. 12, 62-77. <https://doi.org/10.37205/TEL-hun.2019.1-2.03>
13. Mahmoud, O. L., Issa, M. H., Turki, A. T., & Ali, R. M. (2022). Athletic identity and its relationship to moral values among physical education university students. *Education & Science*, 24(3), 41-77. DOI: [10.17853/1994-5639-2022-3-41-77](https://doi.org/10.17853/1994-5639-2022-3-41-77).
14. Martin, A. J. (2007). Examining a multidimensional model of student motivation and engagement using a construct validation approach. *British Journal of Educational Psychology*, 77(2), 413-440. <https://doi.org/10.1348/000709906X118036>
15. OECD (2019) *A Flying Start: Improving Initial Teacher Preparation Systems*, OECD Publishing, Paris. DOI: <https://doi.org/10.1787/cf74e549-en>
16. Olaussen, B. S., Bråten, I. (1998). Identifying latent variables measured by the Learning and Study Strategies Inventory (LASSI) in Norwegian college students. *The Journal of experimental education*, 67(1), 82-96. <https://doi.org/10.1080/00220973.1991.10806587>
17. Orgoványi-Gajdos, J. (2019). The role of the training school in the preparation of teacher candidates. *Teacher Education*, Vol. 18 (46), No. 1-2 DOI: [10.37205/TEL-hun.2019.1-2.05](https://doi.org/10.37205/TEL-hun.2019.1-2.05)
18. Panadero, E. (2017). A review of self-regulated learning: six models and four directions for research. *Frontiers in psychology*, 8, p. 422. <https://doi.org/10.3389/fpsyg.2017.00422>
19. Pinczésné Palásthy, I. (2017). The professional personality of teachers. *MaNar Reformed Education*, 17(1), 5-14.
20. Pintrich, P. R. (2000). The role of goal orientation in self-regulated learning. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (451-502). Academic Press. <https://doi.org/10.1016/B978-0-12109890-2/50043-3>
21. Scanlan, T. K., Chow, G. M., Sousa, C., Scanlan, L. A., & Knifsend, C. A. (2016). The development of the sport commitment questionnaire-2 (English version). *Psychology of Sport and Exercise*, 22, 233-246. <https://doi.org/10.1016/j.psychsport.2015.08.002>
22. Spencer-Cavaliere, N., & Rintoul, M. A. (2012). alienation in physical education from the perspectives of children. *journal of Teaching in Physical Education*, 31, 344-361. <https://doi.org/10.7939/R39X4G>
23. Super, D. E., & Nevill, D. D. (1984). work role salience as a determinant of career maturity in high school students. *journal of Vocational Behavior*, 25(1), 30-44. [https://doi.org/10.1016/0001-8791\(84\)90034-4](https://doi.org/10.1016/0001-8791(84)90034-4)
24. Szabó, D. I. (1994) *Introduction to social psychology*. National Textbook Publisher.
25. Watt, H. M., & Richardson, P. W. (2007). Motivational factors influencing teaching as a career choice: Development and validation of the FIT-Choice scale. *The Journal of experimental education*, 75(3), 167-202. <https://doi.org/10.3200/JEXE.75.3.167-202>
26. Szemes Á., Harsányi. Sz, G., & Tóth, L. (2016). Comparative study of sport motivation and flow experience of athletes competing in different sports. *Physical Education, Sport, Science*, 1. 1. no. 80-90. DOI: [10.21846/TST.2016.1.8](https://doi.org/10.21846/TST.2016.1.8)
27. Weinstein, C. E., & Acee, T. W. (2013). Helping college students become more strategic and self-regulated learners. *Applications of self-regulated learning across diverse disciplines: A tribute to Barry J. Zimmerman*, 197, 236.
28. Weinstein, C. E., & Palmer, D. R. (1987). LASSI user's manual

12. List of publication

12.1. Journal articles

12.1.1. Journal articles in Hungarian

1. Hurtik-Tóth, E., H., E. J., & Tóth, L. (2023). Examining the commitment to learning of physical education students. *MAGYAR SPORTTUDOMÁNYI SZEMLE*, 24(3 (103)), 63-68.
2. Hurtik-Tóth, E., Tóth, L., & H., E. J. (2021). Examining physical education students' commitment to teaching. *TEACHER EDUCATION*, 20(48)(3), 29-53. <http://doi.org/10.37205/TEL-hun.2021.3.02>
3. Hellner, S., Tóth, E., Sziráki, Z., Szmodis, M., & Tóth, L. (2020). Somatic and psychological characteristics of university students in relation to their sporting habits. *HUNGARIAN SPORTS SCIENCE REVIEW*, 21(88 (6)), 22-30.
4. Tóth, E., Ihász, F., & Nagyvárad, K. (2020). Effects of functional training progressions in recreational athletes. *RECREATION*, 10(1), 22-24. <http://doi.org/10.21486/recreation.2020.10.1.2>
5. Kökény, T., Zala, B., Széles, Á., Horváth, M., Tóth, E., & Tóth, L. (2020). Psychological concerns of nourishment with special focus on transgenerational trauma. *Journal of School and University Medicine*, 7(4), 34-44. <http://doi.org/10.51546/JSUM>

12.1.2. Foreign language journal article

1. Tóth, E., H., Ekler, J., & Tóth, L. (2023). Career motivation research of physical education students. In *The characteristics of the learning-teaching process from a sport (sport) perspective* (pp. 44-81). DOI: [10.1556/9789634549079](https://doi.org/10.1556/9789634549079)

12.2. Conference proceedings in a journal or conference proceedings

1. Tóth, E., Ekler Heszteráné, J., & Tóth, L. (2020). *Research on physical education trainee teachers' teaching engagement*. In *Proceedings of 12th International Conference of J. Selye University. Sections of Pedagogy and Informatics* (pp. 135-152). <http://doi.org/10.36007/3778.2020.135>

12.3. Conference presentations:

1. Tóth, E., H., E. J., & Tóth, L. (2022). Career motivations of physical education students. *MAGYAR SPORTTUDOMÁNYI SZEMLE*, 23(5 (99)), 42-43.
2. Tóth, E., H., E. J., & Tóth, L. (2020). Examining the commitment to sport among physical education students. *MAGYAR SPORTTUDOMÁNYI SZEMLE*, 21(3), 96-96.
3. Tóth, E., Tóth, L., & H., E. J. (2019). Examining the commitment of physical education students to a teaching career. In *Sport - Science - Health Abstract Volume II* (p. 25).
4. Tóth, E., Tóth, L., & H. Ekler, J. (2019). Examining university physical education students' commitment to sport and teaching. *MAGYAR SPORTTUDOMÁNYI SZEMLE*, 20(5 (82)), 64-65.

5. Tóth, E., Répási, B., H., E. J., & Tóth, L. (2019). The relationship of athlete burnout with sport motivation, competitive anxiety and flow experience. In 49th *CONFERENCE ON MOVEMENT BIOLOGY*. Programme, abstracts (pp. 28-29).
6. Tóth, E., Laki, Á., & Némethné, T. O. (2018). A comparative study of the perceived motivational environment and extrinsic intrinsic motivational factors of amateur basketball players. *HUNGARIAN SPORTS SCIENCE REVIEW*, 19(5), 77.
7. Tóth, E., Laki, Á., Nagyvárad, K., Polgár, T., & H, E. J. (2018). Summary analysis of Hungarian sport motivation studies from the 2000s to the present. *HUNGARIAN SPORTS SCIENCE REVIEW*, 19(75), 89-90.

12.4. Abstracts

1. Tóth, E., H., E. J., & Tóth, L. (2023). Examining the commitment to learning of physical education teacher education students. *HUNGARIAN SPORT STUDY JOURNAL*, 23(2(102)), 121-121.
Nagyvárad, K. ; Birone, Ilics K. ; Polgár, T. ; Laki, Á. ; Tóth, E. ; Kéri, P. ; Ihász, F.
2. Training on Instable Surfaces (2020). Presentation delivered at the ECSS Congress, 28-30 October 2020 online,
3. Tóth, E., & Biróné, I. K. (2019). physical performance and motivational factors examination of the 1st division waterpolo team. *ECSS Prague*, 2019.07.03-06
4. Nagyvárad, K., Biróné, I. K., Polgár, T., Laki, Á., Tóth, E., Kéri, P., & Ihász, F. (2020). Training on Unstable Surfaces. In 25th Annual Congress of the European College of Sport Science - Book of Abstracts (pp. 455-455).
5. Laki, Á., Kósa, L., Kéri, P., Tóth, E., Szabó, A., & Ihász, F. (2019). Examination of cognitive abilities during physical activity in athletes. *MAGYAR SPORTTUDOMÁNYI SZEMLE*, 20(82), 56-57.
6. K., Nagyvaradi ; K., Biróné Ilics ; T., Polgár ; Á., Laki ; P., Kéri ; E., Tóth ; F., Ihász (2019).
7. CHANGES OF PHYSIQUE IN PARTICULAR AGE GROUPS In: Bunc, V.; Tsolakidis, E. (ed.) *24th Annual Congress of the EUROPEAN COLLEGE OF SPORT SCIENCE - BOOK OF ABSTRACTS* Cologne, Germany: European College of Sport Science (2019) 847 p. pp. 670-670., 1 p.
8. K., Nagyvaradi ; K., Biróné Ilics ; T., Polgár ; Á., Laki ; P., Kéri ; E., Tóth ; F., Ihász (2019). Changes of pshisique in particular age groups. 24th annual congress of the european college of sport science (ecss) Prague
9. Nagyvárad, Katalin ; Biróné, Ilics Katalin ; Polgár, Tibor ; Laki, Ádám ; Kéri, Péter ; Tóth, Enikő ; Ihász, Ferenc (2019). *Helsinki Congress of Sport and Physical Fitness* (2019) pp. 68-68., 1 p.
10. Nagyvárad, K., Biróné, I. K., Polgár, T., Laki, Á., Kéri, P., Tóth, E., & Ihász, F. (2019). Analysis of age-related body composition changes. In XVI National Congress of Sports Science, June 5-7, 2019. Nyíregyháza (pp. 68-68).
11. Kéri, P., Laki, Á., Ihász, F., Nagyvárad, K., & Tóth, E. (2018). Analysis of respiratory and circulatory system data in first grade 15-18 year old boys basketball players in training and playing situations. *HUNGARIAN SPORTS SCIENCE REVIEW*, 19(75), 52-53.
12. Laki, Á., Kósa, L., Kéri, P., Tóth, E., Tóth, E., Szabó, A., & Ihász, F. (2018). Decision-making ability test among basketball players. *MAGYAR SPORTTUDOMÁNYI SZEMLE*, 19(5), 67.

13. Laki, Á., Kéri, P., Nagyvárad, K., Tóth, E., & Ihász, F. (2018). Patterns of heart rate changes during interval-type exercise in post-intercollegiate basketball players. *HUNGARIAN SPORTS SCIENCE REVIEW*, 19(75), 60.
14. Nagyvárad, K., Polgár, T., Ihász, F., Biróné, I. K., Tóth, E., Laki, Á., & Kéri, P. (2018). Age-related characterization of body composition changes in women and men aged 20-60 years. *HUNGARIAN SPORTS SCIENCE REVIEW*, 19(75), 69.

12. 5. Book excerpt:

1. Tóth, E., Laki, Á., & H. Ekler, J. (2018). *Savaria Natural Science and Sports Science Publications*, 17, 181-190.
2. Laki, Á., Kéri, P., Nagyvárad, K., Tóth, E., & Ihász, F. (2018). *Analysis of cardiovascular responses to a single exercise ("vita maxima")*. Savaria Natural and Sport Sciences Publications, 2018(17), 203-211.
3. Laki, Á., Kéri, P., Tóth, E., Kósa, L., Tóth, E., Gangl, J., Schulteisz, N., Nagyvárad, K., Polgár, T., Ihász, F. (2018). *Savaria Natural and Sport Sciences Publications*, 17(1), 191-202.