



Attainment of the Health Outcomes by Implementing Educational Videos During the Final Part of the Physical Education Lesson

Krešimir Hrg¹, Petra Lončar¹, Wanda Haber Zelanto¹, Dario Novak¹, Hrvoje Podnar¹

Affiliations: ¹University of Zagreb, Faculty of Kinesiology, Zagreb, Croatia

Correspondence: P. Loncar. University of Zagreb, Faculty of Kinesiology, Horvacanski zavoj 15, 10 000 Zagreb, Croatia. E-mail: petra.loncar@student.kif.hr

Abstract

This study investigated the impact of educational video content in the final part of the PE lesson on students' health literacy and their perceptions of the usefulness and satisfaction of PE lessons. The study included 160 students in grades 6 to 8 from an elementary school in Croatia, with an average age of 13.75 years, of which 93 (58%) were female. The experimental group (n=111) participated in the PE lessons with educational video content, while the control group (n=49) participated in the standard PE lesson. At the beginning and at the end of the research, both groups completed a theoretical written knowledge test on health literacy and a questionnaire to assess attitudes towards PE lessons. An ANCOVA was used to measure the impact of the experimental programme on post-intervention results while including initial results as a covariate. After the experiment, statistically significant differences were observed between the results of the experimental and control groups of students for Theoretical knowledge (9.90 ± 0.29 vs. 8.33 ± 0.43 , $F(1,159) = 8.998$, $p = 0.003$) and Perception of the usefulness of PE lessons (2.93 ± 0.06 vs. 2.69 ± 0.09 , $F(1,163) = 4.434$, $p = 0.037$), while no statistically significant differences were observed for Satisfaction with PE lessons (2.95 ± 0.09 vs. 3.02 ± 0.06 , $p = 0.553$). The intervention positively affected students' knowledge and perception of PE lessons without impairing their satisfaction, indicating that integrating educational video content into PE lessons connecting physical activity and health literacy is viable.

Keywords: health literacy, usefulness, satisfaction, attitude, elementary school



@MJSSMontenegro
HEALTH OUTCOMES IN PHYSICAL EDUCATION
<http://mjssm.me/?sekcija=article&artid=257>

Cite this article: Hrg, K., Lončar, P., Haber Z, W., Novak, D., & Podnar, H. (2023) Attainment of the Health Outcomes by Implementing Educational Videos During the Final Part of the Physical Education Lesson. *Montenegrin Journal of Sports Science and Medicine*, 19 (2), 11–16. <https://doi.org/10.26773/mjssm.230902>

Introduction

Physical activity, like any physical movement produced by the skeletal muscles, which results in energy consumption above the level of consumption at rest, is a natural human need. It is necessary for preserving and improving health (Caspersen et al., 1985).

Guthold et al. (2020) reported that 81.0% of students aged 11-17 were not physically active, with 77.6% of male and 84.7% of female students falling into this category. To address this alarming trend, it is crucial to use Physical Education (PE) lessons in primary and secondary schools, which are mandatory components of the education system. PE classes can shape

Received: 13 November 2022 | Accepted after revision: 01 May 2023 | Early access publication date: 01 September 2023 | Final publication date: 15 September 2023

© 2023 by the author(s). License MSA, Podgorica, Montenegro. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY).

Conflict of interest: None declared.

the outlook of children and adolescents towards physical activity and health due to their convenient availability as a mode of exercise. Therefore, PE lessons should be used to influence students positively, as they can reach all children (Lepir et al., 2020). Also, continuing physical activity beyond high school is important. Peralta et al. (2021) found positive correlation between physical activity and student well-being. This underscores the significance of maintaining an active lifestyle beyond high school and underscores the necessity for programs that address the issue of physical inactivity.

While the curricula of PE courses may vary across countries, the goals of PE are relatively uniform and are implemented in a similar manner in schools worldwide. A significant aspect of PE objectives is focused on educating children about healthy behaviors that can facilitate lifelong physical activity (Marttinen et al., 2018). Promoting responsible and protective behavior among children and adolescents can contribute to creating a safer and healthier community by ensuring their own safety and that of others (Curriculum for the cross-curricular topic of Health for primary and secondary schools in the Republic of Croatia, 2019).

The educational system in Croatia's primary and secondary schools is based on meeting the educational objectives outlined in the national curriculum for each subject. In addition to meeting the outcomes of the subject, all the teachers and professional associates also participate in the realization of educational expectations of cross-curricular topics. Cross-curricular topics are realised by connecting educational areas and teaching topics of all subjects. Of all defined cross-curricular topics, PE teachers plan to achieve the highest number of outcomes related to health literacy (Curriculum for the subject of physical and health education for elementary schools and high schools in the Republic of Croatia, 2019; Curriculum for the cross-curricular topic of Health for primary and secondary schools in the Republic of Croatia, 2019). The theme's emphasis is on a comprehensive approach to health as "physical, mental, and social well-being, not just the absence of disease" (WHO, 2006).

The development of health literacy means acquiring and developing positive thinking about health and a healthy lifestyle. To achieve the purpose of learning and teaching, it is important to convey knowledge to students in an understandable and interesting way. To achieve the desired health outcomes, it is important to incorporate theoretical knowledge about health literacy into PE lessons, as motor knowledge is mainly applied in this context (Curriculum for the subject of physical and health education for elementary and high schools in the Republic of Croatia, 2019; Curriculum for the cross-curricular topic of Health for primary and secondary schools in the Republic of Croatia, 2019).

PE lessons, like other subjects of the school curriculum, deal with learning and student development. However, physical education has the advantage of learning from physical experience. Hence, it is crucial to take note that students' beliefs and evaluations towards physical education are influenced by how they perceive their experiences (Silverman & Subramaniam, 1999). When the physical experience in class is evaluated in a positive way, students' attitudes reflect a greater willingness to repeat the experience. If these experiences are negative, it is likely that students will try to avoid these activities (Hople & Graham, 1995). Altering one's attitude is not a simple task, although it can be achieved. Understanding how and to what extent attitudes can be changed enables teachers to influence the improvement of their students' attitudes, in this case

on physical activity (Marttinen et al., 2018).

Sucuoglu and Atamturk (2020) explained in their empirical research that attitude theory explains attitudes through one-, two-, and multicomponent models. The first model deals only with emotions, the last multicomponent model deals with emotions, cognitive aspects, and behaviours, and the two-component model, which includes Student's Attitudes Toward Physical Education - SATPE, deals with emotions and cognitive aspects (Subramaniam & Silverman, 2000). The emotional component refers to satisfaction with lessons, and the second, cognitive component, to the perception of the usefulness of lessons (Subramaniam & Silverman, 2000).

Research indicates that most students have a favorable opinion about physical education classes (Silverman & Subramaniam, 1999; Subramaniam & Silverman, 2007; Papla et al., 2019; Phillips & Silverman, 2015), but the average attitude score declines with an increase in grade level (Subramaniam & Silverman, 2007; Phillips & Silverman, 2015), particularly for girls (Mercier et al., 2017; Säfvenbom et al., 2014). Phillips and Silverman (2015) found that in the fourth and fifth grade, both male and female students had similar attitudes towards physical education, and research findings suggest that gender differences in attitudes start to emerge after the fifth grade. Their study also indicates that the teacher and curriculum can impact students' attitudes toward this subject. According to Shropshire et al. (1997), boys tend to display slightly higher levels of enthusiasm or interest in physical education. These findings are supported by the Carcamo-Oyarzun et al. (2022) review of previous research.

The use of video materials in classes has been shown to be effective (Podnar, Novak & Radman, 2018). Furthermore, video-based teaching has been found to engage students, leading to more favorable attitudes toward physical activity (Mok et al., 2020) and improved achievement of desired objectives (Mashari and S, 2021). While Kovac et al. (2021) highlighted teachers' lack of competence in utilizing technology for teaching, they also found that teachers felt confident in their understanding of the health aspects of physical activity. To address this, it is crucial to educate teachers on the significance of technology and its potential to enhance the health aspects of physical activity.

Therefore, the main objective of this study is to investigate the impact of integrating educational video content into the final part of Physical Education (PE) classes on achieving health outcomes, as well as improving the students' perception of the usefulness and satisfaction of the PE lessons. It is hypothesized that intervention will improve theoretical knowledge about health literacy and perception of the usefulness and students' satisfaction with PE lessons.

Methods

Participants

A total of 160 students in grades 6 to 8, with an average age of 13.75 years, and 93 of them (58%) were female, participated in the study. Students were selected from an elementary school in Croatia and divided into four experimental classes (n=111) and two control classes (n=49) through random selection. During the six-week study period, the experimental group watched 3-5 minute educational videos that connected physical exercise with health literacy in the final part of their PE lessons. On the contrary, the control group participated in regular PE classes that focused exclusively on physical activities. The study was approved by the Ethics Committee of the

Faculty of Kinesiology of the University of Zagreb, Croatia. Each participant and their parents provided their informed written consent before participating.

Study protocol

Six classes were randomly assigned to either the control or experimental group, and in the initial lesson, all classes received instructions on the required procedures, with a reminder that data collection would be anonymous. At the beginning of the study, both groups completed a theoretical written knowledge test on health literacy and a questionnaire to evaluate their attitudes toward PE lessons. During six weeks, in the final part of the PE lesson, the experimental group watched and implemented educational video content related to the realization of the outcome of that day. The video showed the stretching exercises that the students performed and important information on health outcomes. This was accompanied by an audio description of the outcome with an explanation. A new video was shown in each class, with a total of six videos. The same six videos were repeated during the final three weeks of the study. Following each video, the experimental group answered a few questions related to the day's topic in a short theoretical test. After answering all the questions and submitting the completed form, the students were shown the correct answers with explanations. The control group continued with the usual PE lessons. After six weeks, both groups completed both questionnaires, i.e. the knowledge test and the attitude assessment questionnaire.

Instruments and Variables

To assess the achievement of health outcomes, a theoretical written knowledge test on health literacy was conducted. The test consisted of a total of 13 questions that the students solved using a Google form. There were two questions for each of the

six topics that the students listened to and watched using video content, while for one topic there were a total of three questions. For each question, students were offered four possible answers, a, b, c, and d, and they could choose only one correct answer and get one point for it. This means that they could achieve a maximum of 13 points. To assess the perception of usefulness and satisfaction with PE lessons, the Croatian version of the attitude assessment questionnaire for PE lessons (Subramaniama & Silvermana 2000) was applied. The questionnaire was conducted using a Google form and comprised 20 questions, of which 10 pertained to perception of the usefulness of PE lessons and the other 10 were related to satisfaction with PE lessons. The students provided their responses to the questions using a Likert scale: 1 – completely disagree, 2 – partially disagree, 3 – neither agree nor disagree, 4 – partially agree, 5 – completely agree.

Statistical analyses

Data collected from the theoretical written knowledge test on health literacy were analyzed using descriptive statistics, and the results were presented visually and compared using the provided displays.

In addition, an analysis of covariance (ANCOVA) was conducted to assess the impact of the experimental program on the final measurements of students' perception of usefulness and satisfaction with PE lessons, with the initial measurements used as a covariate.

Results

The descriptive statistics for the results of the health literacy knowledge test, classified by the control and experimental groups, are presented in Table 1. The results of the written theory knowledge test taken by both groups at the initial and final measurements are presented in Figure 1.

Table 1. Descriptive Statistics of the Theoretical Written Test in Knowledge About Health Literacy

		Valid N	Mean	Min	Max	SD
Initial	E	115	6.92	1.00	11.00	2.06
	C	55	6.56	2.00	10.00	1.94
Final	E	111	9.90	1.00	13.00	3.15
	C	49	8.33	2.00	13.00	2.64

Note: E - experimental group, C - control group

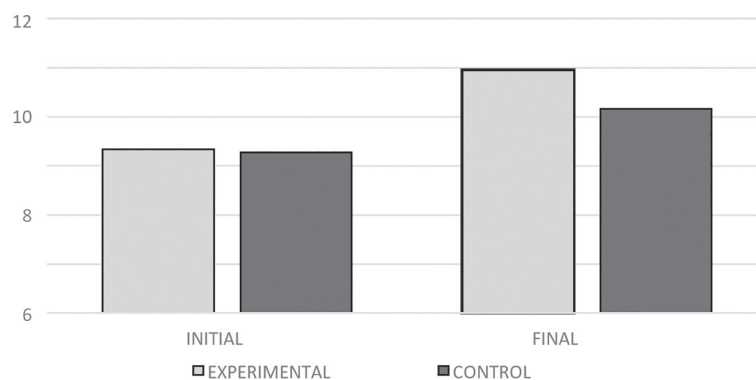


Figure 1. Results of the theoretical written test on knowledge about health literacy

In the initial measurement of the theoretical written knowledge test on health literacy, the experimental group comprised 115 students, while the control group comprised of 55 students. The difference in the average values of the correct

answers between the two groups was minimal. The mean score for the experimental group was 6.92, with a standard deviation of ± 2.06 , while the control group had a slightly lower mean score of 6.56 ± 1.94 . The comparison of mean scores between

the experimental and control groups at the initial measurement is presented in Figure 1.

The differences in the average values to the correct answers of the written final measurement in the theoretical knowledge test on health literacy of the control and experimental groups are not negligible in this case. In Figure 1, it can be seen that, in contrast to the results of the arithmetic means of the initial measurement, the value of the arithmetic mean of the experimental group differs significantly from the value of the arithmetic mean of the control group. The arithmetic mean of the correct answers of the control group is now 8.33 ± 2.64 , while it is slightly higher in the experimental group and amounts to 9.90 ± 3.15 .

A one-way ANCOVA was utilised to assess whether the

experimental programme had an impact on post-intervention scores after controlling for pre-intervention scores.

The experimental group exhibited higher adjusted mean scores for theoretical knowledge (9.90 ± 0.29) compared to the control group (8.33 ± 0.43). Furthermore, when accounting for pre-intervention scores, a significant disparity in post-intervention scores was found for the Perception of Usefulness of PE Lessons, as indicated by an F-value of $(1, 159) = 8.998$ and a p-value of .003. Table 2 presents these findings.

The observed differences in the arithmetic means between the experimental and control groups suggest that the use of educational videos had a beneficial impact on the knowledge of students in the experimental group.

Table 2. Control and Experimental Adjusted Means and Variability for Post-Intervention Scores With Pre-Intervention Scores as a Covariate – Theoretical Knowledge

Component	Control (M±SE) n=96	Experimental (M±SE) n=186	F	p
Knowledge	8.33±0.43	9.90±0.29	8.998	.003

Note: M=Mean, SE=Standard Deviation

Tables 2 and 3 show the average results of the final measurement in the experimental and control groups. The result is shown as the arithmetic mean of all students with a possible standard deviation. In addition, the table lists the results of the

statistical analysis F and p. The level of statistical significance is set at $p < 0.05$.

Students' Satisfaction with PE lessons adjusted post-intervention mean scores were similar for the control (2.95 ± 0.09)

Table 3. Control and Experimental Adjusted Means and Variability for Post-Intervention Scores With Pre-Intervention Scores as a Covariate – Satisfaction and Perception of Usefulness

Component	Control (M±SE) n=43	Experimental (M±SE) n=121	F	p
Satisfaction with PE lessons	2.95±0.09	3.02±0.06	.353	.553
Perception of PE usefulness	2.69±0.09	2.93±0.06	4.434	.037

Note: M=Mean, SE=Standard Error

and the experimental (3.02 ± 0.06) group. Controlling for pre-intervention scores, the post-intervention scores for Satisfaction with PE classes did not show any statistically significant differences, as indicated by $F(1, 163) = .353$ and $p = .553$, according to Table 3.

Higher adjusted post-intervention mean scores were found for experimental (2.93 ± 0.06) than for control (2.69 ± 0.09) group for Perception of PE Usefulness. After controlling pre-intervention scores, there was a statistically significant difference in post-intervention scores for Perception of PE usefulness, $F(1, 163) = 4.434$, $p = .037$ (Table 3.)

By looking at the results of the experiment listed in Tables 2 and 3, it can be determined that the mentioned intervention had a positive effect on students' knowledge and their perception of usefulness of PE lessons, while their satisfaction with PE lessons was not impaired.

Discussion

The purpose of this research was to examine the impact of including educational content in the final phase of physical education (PE) classes, which integrates theoretical health knowledge with physical activity, on students in grades 6 to 8 attending an elementary school. The study aimed to measure the impact on the achievement of health outcomes, as well as on improving the perception of the usefulness and satisfaction of PE lessons. During the experiment, the experimental group watched 3-5 minute educational videos related to the

day's learning objectives, while the control group attended conventional PE lessons with exercise content alone. At the beginning and end of the study, both groups completed a written test on health literacy and a questionnaire to evaluate their attitudes toward PE lessons. Additionally, after watching each video, the experimental group completed a brief theoretical knowledge test with questions regarding the day's topic.

In their review of the literature, Subramaniam and Silverman (2007) determined that students' attitudes can affect their learning. They also noted that a positive and supportive learning environment can enhance students' attitudes toward learning (Subramaniam & Silverman, 2007). After conducting a literature review, Silverman and Mercier (2015) concluded that several factors affect students' attitudes toward physical education, with the teacher and curriculum being the most prominent ones. Teacher interactions and decision-making in class can have a significant impact on students' attitudes towards PE lessons. Effective communication, respect for students, and promotion of knowledge are crucial for shaping positive attitudes. If students feel unsupported or incapable of succeeding in the classroom, they may view the teacher as unsupportive or unhelpful. In such cases, the teacher may not be seen as an ally by the students (Silverman & Mercier, 2015).

The results of the intervention indicate that by changing the way certain curriculum topics are presented, the

students' attitudes toward PE have also positively changed. Phillips et al. (2020) went in the same direction in their research, in which they found that if the way the curriculum is implemented does not change, but the same contents are continuously implemented, students' attitudes will become increasingly negative. After six weeks of intervention, including interesting educational content related to health literacy, the students' perception of the usefulness of PE lessons improved.

According to Phillips et al. (2020), students may consider PE a less important or less useful subject if they do not learn anything in class. In their research, many students expressed dissatisfaction with the lack of learning in PE lessons, which may be the cause of more negative attitudes toward the subject. Subramaniam and Silverman (2002) showed that the students who had a more positive attitude towards PE were those who believed that they had learnt from the material and that they felt that the class was useful. The findings of this study confirm this relationship, as they reveal that the knowledge of the experimental group improved, which can relate to the increase in the perception of the usefulness of PE lessons.

The intervention implemented managed, as far as the perception of usefulness is concerned, to improve the students' attitudes towards PE lessons, but it did not affect the students' satisfaction with them. Previous studies have shown a positive correlation between students' positive attitudes towards PE lessons and their satisfaction with them. This suggests that higher levels of satisfaction with PE lessons could promote positive attitudes towards physical exercise and potentially motivate students to lead a more active lifestyle beyond school (Subramaniam & Silverman, 2007). The impact on students' attitudes toward physical activity through the PE curriculum is the first step in guiding students toward a healthy and active lifestyle, now and in the future.

There are several limitations to this study that must be considered. First, the sample size used was relatively small, which means that the results cannot be generalized to all students in the country. Additionally, the intervention period could have been longer, which may have produced more meaningful results. The study did not consider sociocultural factors, such as participation in sports activities during free time, which could have influenced knowledge about health literacy.

To address these limitations, future research should utilize more comprehensive measures to examine knowledge about health literacy, rather than relying solely on theoretical tests. Additionally, including a larger and more diverse sample size would allow for generalization of findings to a broader population. Furthermore, future research should consider sociocultural factors that can impact health literacy, and incorporate these factors into the study design.

Conclusion

The implemented intervention, which consisted of conducting 3-5-minute-long educational video content tried to improve students' knowledge about health literacy and improve their perception of usefulness and satisfaction with PE lessons.

According to the results, the intervention had a beneficial impact on the students' knowledge and their perception of the value of PE lessons. Additionally, the intervention did

not diminish their satisfaction with the PE lessons. Therefore, these results suggest that the incorporation of educational videos that link exercise activities with theoretical knowledge of health literacy can be incorporated into daily PE lessons without any concerns about negatively affecting the students.

References

- Carcamo-Oyarzun, J., Wydra, G., Hernandez-Mosqueira, C., Martinez-Salazar, C., & Souza de Carvalho, R. (2022). Attitudes towards physical education teachers from a cross-cultural perspective: German and Chilean students' viewpoints. *Cultura, Ciencia Y Deporte*, 17(51). <https://doi.org/10.12800/ccd.v17i51.1614>
- Caspersen, C. J., Powell, K. E., & Christenson, G. M. (1985). Physical activity, exercise, and physical fitness: definitions and distinctions for health-related research. *Public health reports (Washington, D.C.: 1974)*, 100(2), 126–131.
- Curriculum for the cross-curricular topic of Health for primary and secondary schools in the Republic of Croatia, 2019. Available at: <https://mzo.gov.hr/istaknute-teme/odgoj-i-obrazovanje/nacionalni-kurikulum/medjupredmetne-teme/kurikulum-medjupredmetne-teme-zdravlje-za-osnovne-i-srednje-skole/3859>
- Curriculum for the subject of physical and health education for elementary schools and high schools in the Republic of Croatia, 2019. Available at: https://skolazazivot.hr/wp-content/uploads/2020/06/TZK_kurikulum.pdf
- Guthold, R., Stevens, G. A., Riley, L. M., & Bull, F. C. (2020). Global trends in insufficient physical activity among adolescents: a pooled analysis of 298 population-based surveys with 1.6 million participants. *The Lancet. Child & adolescent health*, 4(1), 23–35. [https://doi.org/10.1016/S2352-4642\(19\)30323-2](https://doi.org/10.1016/S2352-4642(19)30323-2)
- Hopple, C., & Graham, G. (1995). What Children Think, Feel, and Know about Physical Fitness Testing, *Journal of Teaching in Physical Education*, 14(4), 408-417.
- Kovac, K., Leskosek, B., Jurak, G., Marinsek, M., & Tul, M. (2021). Differences in Subject-Specific Competences between Slovenian and Italian Physical Education Teachers. *Montenegrin Journal of Sports Science and Medicine*, 10(2), 53-58. doi: 10.26773/mjssm.210908
- Lepir, D., Pajkić, A., & Sekulić, Ž. (2020). Attitudes of primary school students toward physical education: Age and gender specifics. *Fizička kultura*, 74(2), 152-161. <http://dx.doi.org/10.5937/fizkul74-30164>
- Marttinen, R., Fredrick III, R. N., & Silverman, S. (2018). Changes in student attitude toward physical education across a unit of instruction. *Journal of Physical Education and Sport*, 18(1), 62-70. <http://dx.doi.org/10.7752/jpes.2018.01008>
- Mashari, M., & S, A. (2021, January 30). IMPROVING LEARNING OUTCOMES OF PHYSICAL EDUCATION USING MULTIMEDIA TECHNOLOGY IN 4.0 ERA. *Acitya: Journal of Teaching and Education*, 3(1), 27-33. <https://doi.org/10.30650/ajte.v3i1.1409>
- Mercier, K., C. Donovan, A. Gibbone, and K. Rozga. 2017. "Three-year Study of Students' Attitudes Toward Physical Education: Grades 4–8." *Research Quarterly for Exercise and Sport* 88 3): 307-315. doi:10.1080/02701367.2017.1339862
- Mok, M., M., C., Chin, M., Korcz, A., Popeska, B., Edginton, C.R., Uzunoz, F., S., Podnar, H., Coetzee, D., Georgescu,

- L., Emeljanovas, A., Pasic, M., Balasekaran, G., Anderson, E. & Durstine, J.,L. (2020). Brain breaks® physical activity solutions in the classroom and on attitudes toward physical activity: A randomized controlled trial among primary students from eight countries. *International Journal of Environmental Research and Public Health*, 17(5), 1666. <https://doi.org/10.3390/ijerph17051666>
- Papla, M., Wojdała, G., Rasek, J., Królikowska, P., Starzak, J., & Górna-Lukasik, K. (2019). Attitudes towards physical education lessons in students at different levels of education. *Journal of Education, Health and Sport*, 9(4), 301–316. Retrieved from <https://apcz.umk.pl/JEHS/article/view/6809>
- Peralta, M., Santos, J., Bordado, J., Henriques-Neto, D., Martins, J., Cruz, P., Gouveia, E.R., & Marques, A. (2021). Participation in Physical Activity is Associated with Well-being in European University Students. *Montenegrin Journal of Sports Science and Medicine*, 10(2), 41–46. doi: 10.26773/mjssm.210906
- Phillips, S. R., & Silverman, S. (2015). Upper elementary school student attitudes toward Physical Education. *Journal of Teaching in Physical Education*, 34(3), 461–473. <http://dx.doi.org/10.1123/jtpe.2014-0022>
- Phillips, S., R., Marttinen, R., Mercier, K., & Gibbone, A. (2020). Middle school students' perceptions of physical education: A qualitative look. *Journal of Teaching in Physical Education*, 40(1), 30–38. <http://dx.doi.org/10.1123/jtpe.2019-0085>
- Podnar, H., Novak, D. & Radman, I. (2018). Effects of a 5-minute classroom-based physical activity on on-task behaviour and physical activity levels. *Kinesiology*, 50. (2.), 251–259. <https://doi.org/10.26582/k.50.2.17>
- Säfvenbom, R., Haugen, T., & Bulie, M. (2014). Attitudes toward and motivation for PE. Who collects the benefits of the subject? *Physical education and sport pedagogy*, 20(6), 629–646. <https://psycnet.apa.org/doi/10.1080/17408989.2014.892063>
- Shropshire, J., Carroll, B., Yim, S. (1997). Primary School Children's Attitudes to Physical Education: Gender Differences. *European Journal of Physical Education*, 2(1), 23–38. doi:10.1080/1740898970020103
- Silverman, S. & Mercier, K. (2015). Teaching for physical literacy: Implications for instructional design and PETE. *Journal of Sport and Health Science*, 4(2), 150–155. doi:10.1016/j.jshs.2015.03.003
- Silverman, S., & Subramaniam, P. R. (1999). Student attitude toward physical education and physical activity: A review of measurement issues and outcomes. *Journal of teaching in physical education*, 19(1), 97–125. <http://dx.doi.org/10.1123/jtpe.19.1.97>
- Subramaniam, P. R., & Silverman, S. (2000). Validation of scores from an instrument assessing student attitude toward physical education. *Measurement in physical education and exercise science*, 4(1), 29–43. https://doi.org/10.1207/S15327841Mpee0401_4
- Subramaniam, P. R., & Silverman, S. (2007). Middle school students' attitudes toward physical education. *Teaching and Teacher Education*, 23(5), 602–611. <https://doi.org/10.1016/j.tate.2007.02.003>
- Sucuoglu, E., & Atamturk, H. (2020). Correlation relation between professional qualifications of physical education teachers and students' attitudes towards Physical Education classes. *Pedagogy of physical culture and sports*, 24(1), 44–47. <https://doi.org/10.15561/26649837.2020.0107>
- WHO (October 2006). *Constitution of the World Health Organization*. Available at: https://cdn.who.int/media/docs/default-source/documents/publications/basic-documents-constitution-of-who179f0d3d-a613-4760-8801-811dfce250af.pdf?sfvrsn=e8fb384f_1&download=true