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# The Efficiency of the Physical Education Teaching Process

**Abstract:** Physical education (PE) plays an important role in pupils' lives because it enables the development of all motor skills and abilities. Therefore, a qualitative, planned and performed process of the PE subject must be ensured. In this field, there is also a lack in the ability to teach lessons efficiently. In this context, we wanted to ascertain which teaching items influenced the implementation of efficient PE lessons. Fifty-one PE lessons were observed. A total of 306 second- to fifth-grade pupils wore accelerometers to determine the intensity of their physical activity during PE classes. The effective time of the 204 pupils was measured by stopwatches. Only 11 (21.6%) PE lessons had efficiency levels above the established standard (50% of the time spent in high and moderate intensity and at 50% of the effective time). The common teaching items of all the efficient PE lessons that influenced a higher level of pupils' activity were different forms of within-class grouping in one lesson, practical usage of nonverbal communication, addressing instructions to the pupils by names, ensuring differentiation and individualisation, appropriate protection, additional directives, positive feedback and teaching with enthusiasm. General teachers should incorporate the abovementioned items into their teaching of PE lessons to achieve higher levels of pupils' activity.

**Keywords:** physical education, effective time, intensity, teaching items, general teacher-students, efficiency.

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Scientific article

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## Introduction

Physical education (PE) plays an extremely important role in pupils' lives because it enables them to gain sports experience and develop the motor skills and abilities they need to mature holistically. Children must gain positive motor and sports experiences in early childhood or during their first experience in PE because these determine the quality of their lives in the future (Bratina et al. 2011). Most pupils between the ages of five and sixteen worldwide have the opportunity to participate in PE (Green 2008). However, many children do not have the opportunity to participate in the qualitative process of the subject (Hardman 2008). Various quality indicators can measure the quality of the process of PE, such as the effective times of pupils or times when pupils are active during PE lessons according to the teacher's instructions (Maeda and Randall 2003; Ridgers et al. 2006) and the level of the pupils' activity within individual lessons (Hollis et al. 2016).

The American Center for Disease Control and Prevention and the Association for Physical Education in Great Britain recommend that the pupils of elementary and secondary schools be moderately to highly active for at least 50% of the time during their PE lessons (Hollis et al. 2016). The quality of PE determined by the two abovementioned quality indicators (effective times of the pupils and the level of the pupils' activity) can be influenced by the teacher through various teaching items. When it comes to the qualitative teaching of PE, we need to understand these items, including the limitations, opportunities, conflicting messages, nonacceptance of pupils and incorrect teaching in the case of their inappropriate use (Evans and Davies 2017). Through qualitative lesson items (i.e., by using different methods and forms of within-class grouping in one lesson, nonverbal communication, qualitative and appropriate types of demonstration (indirect or direct), etc.), as well as differentiating and individualising the lessons (Arefiev et al. 2020; Štemberger 2003), the teacher can strongly influence the development of the positive state of the pupils during PE lessons, contributing to the development of the pupils' inner motivation for movement, respect for fellow pupils during motor/sports activity and positive evaluation of one's progress (Alderman et al. 2006). By selecting different methods and forms of within-class grouping in one lesson, the teacher can enable a higher

quality of lessons because his or her teaching is not monotonous. The performance of the PE lesson must be a combination of developing motor skills, the selection of the appropriate teaching items regarding the developmental stage of the pupils and respectful and motivational instructions (Pettifor 1999). Based on the curriculum objectives, the teacher must select content and methods of work appropriately because in this way, he or she takes care of the biopsychosocial development of a child and the alleviation or elimination of negative effects of several hours of sitting (Štemberger 2005b). However, to influence as many indicators as possible for the quality of school lessons, it is not sufficient to select only the appropriate forms of within-class grouping and teaching methods. In the gym, the teacher's nonverbal communication with pupils is also very important, such as a smile, a considerate touch of the pupil's hands or elbows, through which he or she can get the pupils' attention, positioning of the teacher in the gym, hand movements and so forth (Pease and Pease 2016).

Nonverbal communication is far more than mere body language because in addition to gestures (hand movements), posture and dynamics of the body and facial expressions, proximal zones (space around the teacher), touch and other types of nonverbal communication must also be respected because in these zones, individuals occupy space (Burger 2000), which can significantly improve or worsen the quality of PE lessons. Teachers must be able to find the appropriate type of communication with their pupils. At the same time, they must be able to adapt the activities of the pupils in a sensible way (Armour 2006), meaning that teachers must be flexible and adaptable, which is currently the main topic in the discourse on the education and training of future teachers (Jukić and Škojo 2019) because we must consider their personal growth in their education (Galustyan et al. 2017). Above all, we need to discuss in detail what the qualities, characteristics and competences of a good teacher are (Makovec 2018).

Even though teachers may have the appropriate competencies for teaching PE, when observing PE lessons with different content, it is possible to see that many school lessons are inefficient and of a poor quality (Fairclough and Stratton 2006). Some studies in Slovenia have reported on low effective times and low pupil activity during their PE lessons (Štemberger 2005a; Pušnik et al. 2014), which has been found in the Netherlands (Slingerland et al. 2012) and the United States (Diamant et al. 2011) as well. Levin et al. (2001) noted that PE lessons for the third to fifth grades are planned and implemented in such a way that a lesson that should last 45 minutes last approximately only 33 minutes at each grade level. During this time, pupils are only moderately and highly active for between 10 and 14 minutes, which means that they spend more than 19 minutes at low levels of activity. However, children and adolescents should reach at least 60 minutes of moderate and highly intensive motor/sports activity daily to maintain their health (WHO 2011); therefore, only 10 to 14 minutes in PE lessons is an especially low value for those children for whom PE may be their only option for physical activity during the day (Trudeau and Shephard 2005).

The field of PE, which is mainly focuses on the timing of lessons, the appropriate teaching of methodical approaches, and the adequate safety of pupils, is well researched. However, empirical research dealing with the influence of different teaching items on the efficiency of PE lessons is scarce.

Therefore, the current research aimed to identify which of the observed teaching items influenced the implementation of efficient PE lessons (higher effective times and higher levels of activity of the pupils during PE lessons) and in which way.

## Methods

The performed research had a quantitative research approach. To identify which teaching items influence the efficiency of PE lessons, we used a cause-related, nonexperimental working method.

### *Participants*

In a nonprobability sample, 51 PE lessons were observed, which were taught by 51 GT students[1] in their fourth year at the Faculty of Education in Ljubljana, from the Department of Primary Teacher Education. These GT students already completed three years of practical pedagogical training as part of their studies (weekly practical pedagogical training with lessons teaching and weekly and monthly pedagogical practices under the supervision of mentors from the faculty, classroom teachers and PE teachers in primary schools). Within the framework of the class Theory of Sports with Didactics of Physical Education 3, the GT students taught second- to fifth-grade pupils (also under the supervision of a mentor from the faculty, classroom teachers and PE teachers) of two of Ljubljana's primary schools during their PPT. There were 23 to 27 pupils in the classes (average age: 8.5 years old). A total of 306 pupils wore accelerometers during the lessons. The effective times of 204 pupils were measured.

### *Procedure*

The research took place from October to December 2018 every Monday and Tuesday for four school hours at two primary schools in Ljubljana. On Mondays, the measurements were carried out at one primary school and on Tuesdays at the other. On Mondays, the measurements were carried out so that on the first two Mondays, the same four classes participated in the measurements (the GT students changed every hour so that every GT student taught only one hour). On the following two Mondays, there were another four classes. On Tuesdays, the same

[1] GT student: general teacher-student

four classes were scheduled. The GT students also taught the pupils only a single lesson each. In addition to the GT student who taught the observed lesson, seven other GT students were present in the gym as external observers. These seven GT students also took part in the study, so they were attaching the accelerometers to the pupils, measuring effective times and recording the lessons. Every two weeks, they took turns: four of the GT students remained (three and the GT student who was teaching), and four new ones joined. In each lesson, six pupils wore an accelerometer (three girls and three boys). The GT students who attended the lessons installed the accelerometers on the pupils (on their quadriceps) before the lessons. They also used stopwatches to measure effective times during the lessons. In each lesson, the effective time was measured for two girls and two boys, all of whom were randomly selected. The GT students sat sufficiently far apart in the gym that they could not see the other observers' stopwatches. Whenever a pupil who was measured was active according to the GT student's instructions, the observer GT students measured the seconds of the pupil's activity with a stopwatch. All lessons were analysed based on the observation form and with the consent of the parents of the pupils and the GT students; this was recorded on a tablet computer so that the later analysis and testing of the results were possible. The purpose of the research was explained in writing to the GT students and the parents of the pupils participating in the research; complete anonymity was guaranteed for all.

*Measuring instruments*

Three different measuring instruments were used for the research:

- Six accelerometers, MMOXX1.07 (USB waterproof physical activity sensor 35×35×10 mm), by which we measured the level of intensity of the pupils' activity.
- Four stopwatches.
- An observation form, summarised according to Haerens et al. (2013), with which we monitored a GT student's teaching.

Accelerometers measured the level of intensity of the activity of pupils during the lessons: how many minutes they spent in low (< 3 METs[2]), moderate (3 ≤ 6 METs) and high activity (> 6 METs) (Colley and Tremblay 2011). The observation form (Haerens et al. 2013) originally contained 20 items (which were combined into four dimensions: relatedness support, before the activity, during the activity and autonomy support) and a 4-point Likert-type scale (never observed, sometimes observed, often observed and observed all the time) for each item. The dimensions had already calculated values of Cronbach's alpha coefficients, ranging from 0.83 to 0.60. We added five items following the calculated measuring characteristics (united in one dimension: the GT student's performance;

[2] MET: Metabolic equivalent of task

Cronbach alpha: 0.84), which we considered important for the success of the PE lesson. We changed the 4-point Likert-type scale into nine time intervals because this allowed us to record the data for the observation form more accurately. Each interval of observation was five minutes long. Then, we marked 1 point for each item if it was observed in the previous five minutes or 0 points if the item was not observed. Because a single measurement lasted 45 minutes (a single lesson), we evaluated nine intervals. The span of possible evaluations ranged from 0 (the item was never noticed) to 9 (the item was noticed in every interval). By choosing this method of observation, we achieved a more objective evaluation of the individual's teaching.

The acquired data were processed with IBM SPSS Statistics 22 software for MS Windows. We divided the lessons into two groups based on the results obtained using the accelerometers and stopwatches:

- Efficient (the effective times of the pupils amounted to 22 minutes or more they were active at least 50% of the lessons according to the GT student's instructions, as measured by stopwatches; in addition, the amount of high and moderate activity amounted to at least 22 minutes (the level of activity measured by accelerometers) of the pupils during the lesson).
- Inefficient (the effective times of the pupils were lower than 22 minutes, along with the amount of high and moderate intensity of the activity, or they spent more than 50% of the time in low intensity of the activity or were even inactive).

We connected the GT students who gave efficient lessons to the observation form items to ascertain what these GT students did differently from those whose lessons were not so efficient. First, we checked whether the variables within the dimensions were distributed according to a normal distribution. We verified the normality of the distribution using the Shapiro–Wilk test. Because of the small sample size and the fact that the distribution of some the variables (relatedness support, during the activity and GT student's performance; among GT students with efficient lessons) deviate statistically significantly from normal, we continued to use a nonparametric Mann–Whitney test to check the differences in each dimension between GT students with efficient and inefficient lessons. We continued to use the Mann–Whitney test to verify in which individual items these two groups differed and which items influenced the efficiency of the lessons.

## Results

| | | N | Minimum (minutes) | Maximum (minutes) | Mean (minutes) | Std. Deviation |
|---|---|---|---|---|---|---|
| Effective times | Efficient lessons | 11 | 22.02 | 23.36 | 22.57 | 0.45 |
| | Inefficient lessons | 40 | 4.23 | 21.59 | 11.23 | 5.05 |
| Number of minutes of moderate and high intensity of the activity | Efficient lessons | 11 | 22.00 | 29.01 | 25.04 | 2.25 |
| | Inefficient lessons | 40 | 4.04 | 28.01 | 15.03 | 5.32 |

*Table 1: Descriptive statistics for the effective times and number of minutes of moderate and high intensity of the activity of pupils during the PE lessons.*

Table 1 presents data on the effective times and levels of intensity of the activity of pupils in 51 measured PE lessons (efficient and inefficient lesson): 11 (21.6%) of 51 lessons were efficient, and 40 (78.4%) were inefficient. The data on the effective time for a single lesson are the average of the measured four effective times of the pupils, that is, two girls and two boys. The lowest effective time of an inefficient lesson amounted to only 4.23 minutes and the highest 21.59 minutes. The lowest effective time of an efficient lesson amounted to 22.02 minutes and the highest as much as to 23.36 minutes. The average of the effective times of the measured efficient lessons amounted to 22.57 minutes and inefficient to 11.23 minutes, which is quite low in view of the established criteria, for which 22 minutes of effective time is one of the conditions for an efficient lesson. The data on minutes spent in moderate or high intensity (at least 22 minutes is one of the set conditions for an efficient lesson) is the average of the measured six pupils who wore accelerometers (i.e., three girls and three boys). The lowest amount of moderate and high intensity of an inefficient lesson amounted to only 4.04 minutes and the highest to 28.01 minutes. The lowest amount of moderate and high intensity of an efficient lesson amounted to 22.00 minutes and the highest to 29.01. The average amount of moderate or high intensity of the measured efficient lessons amounted to 25.04 minutes and inefficient to 15.03 minutes, which is quite low in relation to the established criteria for the efficiency of PE lessons.

| Dimension | Group | N | Mean | St. Deviation | Mann–Whitney U | Asymp. Sig. (2-tailed) |
|---|---|---|---|---|---|---|
| Relatedness support | Efficient lessons | 11 | 8.04 | 0.49 | 34.000 | *.000* |
| | Inefficient lessons | 40 | 5.80 | 1.74 | | |
| | Total | 51 | | | | |
| Before the activity | Efficient lessons | 11 | 6.76 | 0.52 | 51.500 | *.000* |
| | Inefficient lessons | 40 | 5.07 | 1.61 | | |
| | Total | 51 | | | | |
| During the activity | Efficient lessons | 11 | 8.09 | 0.55 | 24.500 | .000 |
| | Inefficient lessons | 40 | 5.52 | 1.77 | | |
| | Total | 51 | | | | |
| Autonomy support | Efficient lessons | 11 | 6.40 | 0.59 | 46.000 | *.000* |
| | Inefficient lessons | 40 | 4.54 | 1.64 | | |
| | Total | 51 | | | | |
| GT student's performance | Efficient lessons | 11 | 7.29 | 0.33 | 22.500 | *.000* |
| | Inefficient lessons | 40 | 4.87 | 1.67 | | |
| | Total | 51 | | | | |

*Table 2: Differences in the dimensions regarding the efficiency of PE lessons*

Table 2 shows the results of the Mann–Whitney U statistics of the individual dimensions. Here, the GT students with efficient lessons had a statistically important higher value of the use of teaching items during PE lessons in all five dimensions compared with the GT students with inefficient lessons ($p < 0.001$).

In continuation, we analysed the differences between individual items within each dimension (*Table 3*).

| Dimension | Item | Mean | | St. Deviation | | Mann–Whitney U | Asymp. Sig. (2-tailed) |
|---|---|---|---|---|---|---|---|
| | | Efficient | Inefficient | Efficient | Inefficient | | |
| | The GT students: | | | | | | |
| Relatedness support | 1. teaches with enthusiasm | 9.00 | 6.27 | 0.00 | 1.95 | 133.000 | *.037* |
| | 2. respects the positions of the pupils; (s)he is emphatic | 7.27 | 5.38 | 1.01 | 1.86 | 100.000 | *.005* |
| | 3. brings effort and energy in the lesson | 8.18 | 6.08 | 0.41 | 2.07 | 33.000 | *.000* |
| | 4. moves/stands close to the pupils | 9.00 | 5.40 | 0.00 | 1.57 | 27.500 | *.000* |
| | 5. pays attention to the questions and answers of the pupils | 6.73 | 5.85 | 1.01 | 1.25 | 148.500 | .093 |
| Before the activity *(GT student's work before the start of pupils' activities)* | 6. ensures various tasks and elements | 9.00 | 5.48 | 0.00 | 1.75 | 33.000 | *.000* |
| | 7. gives clear (verbal) instructions | 9.00 | 6.10 | 0.00 | 1.61 | 22.000 | *.000* |
| | 8. demonstrates the elements | 6.37 | 5.95 | 0.75 | 1.72 | 187.000 | .437 |
| | 9. gives information/insight about the contents and the structure of the lesson to the pupils | 5.00 | 4.32 | 0.63 | 1.53 | 185.500 | .407 |
| | 10. explains the purpose of the contents and the elements which will be taught in the lesson to the pupils | 4.45 | 3.48 | 1.21 | 1.43 | 167.500 | .207 |
| During the activity *(GT student's work during the pupils' activities')* | 11. presents pupils and their performances as a role model | 7.45 | 5.80 | 1.29 | 1.80 | 16.500 | *.000* |
| | 12. offers help to the pupils during their performance of the elements | 9.00 | 6.42 | 0.00 | 1.69 | 38.500 | *.000* |
| | 13. offers new directives, instructions and advice to the pupils during the performance of the elements (in addition to the already set instructions) | 9.00 | 5.43 | 0.00 | 1.78 | 27.500 | *.000* |
| | 14. calls pupils by their names | 6.00 | 3.78 | 1.48 | 1.81 | 16.500 | *.000* |
| | 15. gives positive feedback to the pupils | 9.00 | 6.15 | 0.00 | 1.75 | 118.000 | *.015* |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Autonomy support | 16. observes whether the pupils reach certain standards after receiving their instructions (perform the tasks correctly) | 9.00 | 5.75 | 0.00 | 1.46 | 118.500 | *.009* |
| | 17. sets questions to the pupils about their interests, problems and desires | 3.91 | 3.70 | 0.83 | 1.65 | 174.500 | .256 |
| | 18. enables the possibility of a choice to the pupils | 3.82 | 3.45 | 0.75 | 1.48 | 196.000 | .534 |
| | 19. allows pupils to practice their performances independently and solve problems without interference of others | 6.27 | 5.60 | 1.35 | 1.63 | 203.500 | .667 |
| | 20. ensures differentiation and individualisation in the performance of the elements | 9.00 | 4.20 | 0.00 | 1.96 | 16.500 | *.000* |
| GT student's performance | 21. lets the pupils know with nonverbal communication that (s)he masters the topic (s)he teaches (stand-up posture, walking among the pupils and raised chin) | 9.00 | 5.78 | 0.00 | 2.07 | 38.500 | *.000* |
| | 22. shows an open level of communication with the pupils with nonverbal communication (does not cross legs suddenly, does not cross arms on his/her chest, has open palms against the pupils and establishes eye contact with the pupils) | 9.00 | 5.85 | 0.00 | 1.96 | 27.500 | *.000* |
| | 23. silences the pupils with nonverbal communication to have the opportunity to speak (a short touch of the pupil's elbow/upper arm/forearm, index finger on his/her mouth and rapidly raising his/her hand) | 9.00 | 5.37 | 0.00 | 1.85 | 16.500 | *.000* |
| | 24. uses various methods of work (explanation, conversation, etc.) | 6.45 | 5.23 | 1.04 | 1.51 | 151.000 | .074 |
| | 25. uses various forms of within-class grouping (frontal (work in lines, range, relay games, etc.) and group (work on the stations, additional and supplementary tasks, playgroups, orbital exercise, etc.)) | 3.00 | 2.12 | 0.63 | 0.97 | 132.000 | .012 |

*Table 3: Differences between the GT students with efficient and inefficient lessons for each item*

The results of the Mann–Whitney test are presented in Table 3. We checked whether there were differences in the average ranges of the individual items of a lesson in terms of efficient and inefficient lessons. Statistically significant differences with a risk lower than 0.05 are marked in italics. Table 3 shows which items (based on the results obtained) proved to have a significant influence on the efficiency of PE lessons and which items occurred among GT students whose PE lessons were the most efficient.

## Discussion

The most significant advantage of the current study was the identification of different teaching items common to all efficient PE lessons, that is, the items that influenced efficiency in PE lessons. Based on this identification, we obtained information on what we need to pay more attention to when educating future general teachers because more focus is needed on different approaches to teaching younger pupils in the gym, which is an entirely different space from the classroom, where general teachers will spend most of the time with their pupils. Consequently, they must become familiar with the teaching items that can help them achieve more efficient PE lessons.

Therefore, these findings have important implications for practice because a significant problem arises here, given that only 11 of the 51 observed PE lessons in our study were efficient per established standards. Such a result was extremely low and below expectations given that the GT students who taught the lessons had the appropriate knowledge about the content of their lesson. However, we observed a lack of an adequate approach towards teaching in the gym, so we further analysed which teaching items were the ones that contributed to higher effective times and higher levels of pupils' activity or to the higher efficiency of the PE lessons.

All items with which the relatedness support was measured influenced the implementation of efficient PE lessons, except the one that concerned GT students' attention to the pupils' questions and answers ($p = 0.093$). This item did not prove to be essential for achieving higher effective times and a higher level of the activity because, among other things, it is strongly related to the GT student's clear instructions and the pupil's good understanding of the GT student's instructions. The first three items with which relatedness support was measured (teaching with enthusiasm, empathy and putting effort and energy in the lesson) are related to the GT student's positive energy and to a warm and friendly approach towards pupils. All three proved to be significant in achieving a higher efficiency of the lesson. However, the observation was somewhat more difficult here because there was a lower degree of objectivity included in the assessment of the presence of any item that could influence the outcome. Haerens et al. (2013) also warned about incomplete objectivity in the interpretations of the items; they noted that they are of extraordinary importance for the quality of PE, even though their measurements were made in a different way than ours were: without measuring the level of intensity

of pupil activity with accelerometers and without measuring the effective times. It is precisely because of such a difference in research design that it is more difficult to compare the results. The fourth item in the first dimension (moving near the pupils during teaching) can also be classified (in addition to the positive approach towards pupils) as nonverbal communication. The item also proved to statistically significantly impact the efficiency of PE lessons because the GT students had the pupils under control much more easily in such a large space and did not lose any time by silencing them and repeating the instructions.

Only two out of five items with which the dimension before the activity was measured proved to be essential for the successful performance of a PE lesson: ensuring various tasks and elements and giving clear verbal instructions. The importance of giving clear instructions was already highlighted in the previous dimension relatedness support. The item of ensuring various tasks and elements that must be performed by pupils during the lesson also was found to lead to higher pupils' activity because this concept means a greater variety of performances while creating greater interest of the pupils, preventing boredom and a lack of motivation. If the tasks are interesting for the pupils, they will want to perform them and repeat them several times. Consequently, they will attain higher levels of intensity. Surprisingly, the direct demonstration did not appear to significantly affect the efficiency of PE lessons. We assumed that this was the quickest and most straightforward way for the GT student to show the pupils what he/she expected them to do without wasting unnecessary time on verbal explanations (Raiola 2017). Based on the results obtained in this case, the GT students' explanation of the required tasks during the examined lessons was so clear that the pupils understood what they had to do without multiple direct demonstrations. In this way, they did not lose any time, meaning a high level of pupil activity. In this way, the GT students could use other methods of explaining the lesson content in other ways (including indirect demonstration, which can be performed by a pupil). Giving information/insights about the content and structure of the lesson and explaining the purpose of the content and elements taught during the lesson did not prove to impact the success of the performed lesson. Any additional explanation would rob the GT student of too much time that he or she could use for the activity. Nevertheless, Farkas and Grolnick (2010), Jang et al. (2010) and Sierens et al. (2009) warned that all three items (direct demonstration, giving information/insights about the content and structure of the lesson, explaining the purpose of the content and element taught during the lesson), which did not prove as important for achieving 50% of high and moderate pupil activity intensity in our research, are very important and must be included in PE lessons because pupils must know exactly what is expected. Otherwise, when teaching new elements, they may adopt incorrect movements that would be difficult to correct later.

All five items with which the third dimension (during the activity) was measured proved to statistically significantly impact the success of the PE lesson. The GT student who gave positive feedback to the pupils during the lesson and presented the pupils and their performances as role models received positive feedback from the pupils. The pupils put in more effort with their performances and repeated

them several times; thus, they achieved a higher activity level because they were verbally rewarded by the GT students (Säfvenbom et al. 2015).

Also performing a more successful lesson were those GT students who could recognise the pupils' problems with a particular movement and offer immediate help by assisting them or securing them (if they understood what the pupil had to do but were unable to perform the movement) or by offering additional directives if the expected task was not understood. In this way, the GT students avoided downtime because the pupils knew what they had to do and were receiving physical help if someone was not able to do the movement. Calling pupils by name also proved to be essential for achieving efficient PE lessons, which somewhat surprised us. All pupils wore stickers with their names on their T-shirts during the observed lessons so that the GT students who did not know them could call on them. Based on the results, we can conclude that the GT students who addressed the instructions directly to the pupils by using their names achieved the desired effect more quickly; thus, no time was lost. Consequently, the pupils were active for more time.

Only two items with which autonomy support was measured proved to be important in the performance of a successful PE lesson: ensuring differentiation and individualisation and observation of the appropriate performances of pupils. Differentiated and individualised work was an expected item—even one of the most important ones—because only by ensuring differentiation and individualisation can GT students achieve the maximum activity of all pupils; this is because this enables the GT students to adapt lessons to the abilities of all pupils (Arefiev et al. 2020). Differentiation and individualisation must be planned as part of the lesson plan. Nevertheless, some pupils may surprise the GT students during the lesson with worse or better knowledge than expected. It is necessary to adapt for such a pupil or minor group of pupils so that they can participate, learn, achieve, fulfil certain knowledge standards and reach a certain level of activity. However, this can only be done by accurately observing the performances of the pupils during the lesson, which has also proven to be an important item in our research. Asking questions about the pupil's interests and desires, allowing multiple choices of elements and offering tasks that the pupils can practice independently without cooperation with classmates did not prove to be significant for efficient PE lessons. The effective times of the pupils in the lessons that included these items were low, as was their activity level. During some lessons, they did not reach even a single minute of high activity. When the pupils were not guided through the whole content accurately, they were not able to organise themselves well, which meant a poorer quality of the lesson.

In the last dimension (GT student's performance), we wanted to examine the five additional items, which focused on their potential influence on the successful performance of PE lessons. The results showed that the GT students who used nonverbal communication to show mastery of the topic they taught, who maintained an open level of communication with their pupils and looked them in the eye and who were able to silence the pupils by certain signs without raising their voice, were more successful in teaching more efficient PE lessons. During the successful lessons, the GT students attributed great importance to nonverbal communication (by raising their hands, they called the pupils to come to them; by a considerate

touch of the pupils' palm, shoulder or elbow, they silenced the individuals so that they could speak; they established eye contact with all pupils and informed them by facial expressions that they were satisfied with their work, etc.), thus achieving a higher level of activity and high effective times. The GT students who, for example, performed two or more forms of within-class groupings in parallel (e.g., frontally in one half of the gym and in the stations in the other half) were also successful. In addition to constant differentiation, the efficient GT students ensured many different activities and the maximum activity of the pupils. There is an indication that the use of different teaching methods could also impact the efficiency of the lessons because the level of statistical significance of the differences in the use of different teaching methods between efficient and inefficient lessons is on the border of significance ($p = 0.074$).

## Conclusion

At least part of a child's recommended weekly motor/sports activity could be obtained through PE. Therefore, a qualitative PE process must be ensured. This would enable pupils to gain motor and sport experiences. Only 11 out of the 51 observed lessons reached 50% effective times of the pupils and where 50% of the minutes were spent in moderate or high intensity. Based on the results of our research and the research of other authors (Haerens et al. 2013), the important items for efficiently and qualitatively performed PE lessons are a meaningful use of nonverbal communication in teaching, ensuring differentiation, individualisation, various tasks and forms of within-class grouping, accurate observation of the pupil work during the lesson, ensuring appropriate safety and additional directives, addressing pupils by names during instruction (clear and short verbal instructions), positive feedback and teaching with enthusiasm.

In the current study, we examined 25 items that we linked to the efficiency of the lesson. This was shown by the pupils' activity data obtained through accelerometers and the measured effective times. Nevertheless, the present study was restricted to examining the PE lessons that were led by GT students. Also, the content of the lessons and didactic level of the learning process varied; therefore, generalizability is limited. In additional studies, we would need to study certain items that may not have been important (e.g., direct demonstration, etc.) on larger samples and in research that would take longer in different schools and different environments. In our research, we focused only on GT student behaviour. In further research, we will add the influence of the age of the children on their response to certain items (e.g., the influence of different items on the successfulness of the lesson in the first and fifth grades) and the influence of the group size, content, didactic level of the learning process and space of the performance of the lesson (the gym or outside the school premises) on the quality of the items for teaching PE.

Notwithstanding the additional conclusions of future research, we believe that the items that have been shown to be important in achieving a high level of pupil activity in the efficient and quality lessons should be taken into account to a

greater extent in studies of primary school teachers. Education of future teachers must be aimed at being able to perform efficient and qualitative lessons, in addition to gaining the appropriate sports knowledge and good teaching of the content.

In the course of their studies, after the acquisition of knowledge, GT students first encounter lesson planning. Later, they encounter teaching pupils. This is why we must teach them how to make the best use of the time spent in PE lessons (an important perspective of including different forms of within-class grouping, individualisation, differentiation, nonverbal communication in the gym, etc.) so that their pupils can later get the maximum benefit from the minutes allocated to this subject.

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**PROCES UČINKOVITEGA POUČEVANJA PREDMETA ŠPORT**

**Povzetek:** Predmet šport ima v odraščajočem obdobju učencev pomembno vlogo, ker jim omogoča razvijanje vseh gibalnih sposobnosti, zato jim mora biti zagotovljen kakovostno načrtovan in izpeljan proces omenjenega predmeta. Na tem področju je še vedno opaziti velik primanjkljaj, čeprav se znanje študentov, ki bodo predmet šport poučevali, kaže kot ustrezno. V povezavi s tem smo želeli ugotoviti, kateri dejavniki vplivajo na izpeljavo učinkovitih učnih ur športa. Opazovanih je bilo 51 učnih ur. 306 učencev od 2. do 5. razreda je nosilo merilnike pospeška, s katerimi je bila izmerjena raven intenzivnosti gibalne dejavnosti učencev med učnimi urami. 204 učencem je bil s štoparicami izmerjen efektivni čas. Le 11 (21.6 %) učnih ur je bilo učinkovitih skladno s postavljenimi kriteriji (50 % vsota minut, ko so bili učenci srednje in visoko intenzivno aktivni ter 50 % minut efektivnega časa učne ure). Dejavniki, ki so bili skupni vsem učinkovitim učnim uram športa, in so vplivali na višjo aktivnost učencev, so bile različne učne oblike znotraj ene učne ure, smiselna raba nebesedne komunikacije, naslavljanje navodil učencem po imenih (kratka besedna navodila), zagotavljanje diferenciacije, individualizacije, ustreznega varovanja, dodatnih smernic in pozitivnih povratnih informacij ter poučevanje z navdušenjem. Te dejavnike bi morali učitelji z namenom doseganja višjih ravni intenzivnosti aktivnosti učencev med učnimi urami športa vključevati v svoje poučevanje.

**Ključne besede:** predmet šport, efektivni čas, raven intenzivnosti, dejavniki poučevanja, študenti, učinkovitost

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