

# Physically Active Breaks in the Teaching Process: Impact on the Pupils' Educational Achievements

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## ABSTRACT

*The aim of this research is to study the impact of physically active breaks, accompanied by video materials, on the level of pupils' educational achievement and their attitudes toward physically active breaks during the teaching process in the classroom. The research lasted for two months, and the apposite sample consisted of a total of 38 pupils aged 10 to 11. The influence of physically active breaks on the educational achievement was estimated by the percentage of correct answers in the tasks of mathematics, while the Croatian version of the questionnaire Attitudes towards the Physical Activity Scale (APAS) was used for evaluating the attitudes toward physically active breaks with video materials. Differences between the initial and final measuring inside the same group were tested by the Student's dependent sample t-test, while for differences between the experimental and control group the Student's independent sample t-test was used. The obtained results showed that the ability to solve mathematical tasks in the experimental group has significantly improved when compared to the control one and that physically active breaks have a positive influence on the pupils' attitudes toward physical activity. The implementation of physically active breaks into teaching has an impact on pupils' productivity in the educational process, while at the same time their need for movement is fulfilled.*

**Key words:** attitudes, educational achievement, mathematics, physically active break, video materials

## Introduction

It is universally known that life without physical activity is almost unimaginable, but the fact that a smaller number of people is active and that they spend most of their free time in a sitting position is a testimony to today's way of life. In the past, human existence was ensured exclusively by muscular work, while the contemporary people's need for an active way of life has been drastically reduced. The today's person's organism has not changed as much as their way of life; therefore, muscular activity is still necessary to have a positive impact on the whole organism wellbeing. Physical activity was and remains an unavoidable biological incitement necessary for the regulation of structures and functions of organs and organic systems<sup>1</sup>. Except for physical appearance, it can positively influence the development of the nervous system, improvement in concentration, planning, coordination processes and academic success<sup>2</sup>.

Physical activity is closely linked to physical, psychological, and social aspects of health and in the children's age it influences the normal growth and development of organs and ensures the best realisation of genetic poten-

tials<sup>3</sup>. In the shelter of the school as an educational institution, changes in pupils' physical activity can be significantly influenced, because missed opportunities of influencing the quality and quantity of knowledge and abilities with children cannot be compensated in adulthood<sup>4</sup>. According to the results from the study of Maeda & Randall<sup>5</sup> 85 % of children belong to the kinaesthetic learning type, which means that children learn better through movement than through sitting and listening to lectures. Since movement is an inseparable part of learning and thinking<sup>6</sup>, physical activity should not only be a part of Physical Education classes, but movement can be well implemented in other subjects' syllabuses.

By the complexity of teaching and learning, the teaching process often imposes requests on pupils for long-lasting sitting and listening periods of factual knowledge acquisition, which makes it monotonous, lacking interest and motivation. In the contemporary approach to teaching oriented toward the pupil as an active participator in the process, the need for a rest, pause, break between teaching activities is natural. Physically active breaks can be eas-

ily implemented in teaching due to its short duration and are conducted as a motivation for learning during the teaching process or after it, depending on the moment the teacher notices that the pupils' concentration is reduced and that they need a break from learning<sup>6</sup>.

In the past there were more and more research studies investigating the influence of various types of physically active breaks in the classroom on different outcomes. According to the Murray and Ramstetter<sup>7</sup>, children and young persons were more concentrated and capable for cognitive processes after a physically active break, while teachers subjectively estimated and came to the conclusion that physically active breaks have an impact on concentration and attention, and that they conducted them when they noticed pupils' unrest or lack of focus during lessons<sup>8</sup>. Howie, Schatz and Pate<sup>9</sup> observed the influence of 5, 10, 15 and 20-minute physically active breaks on 9 to 12-year-old pupils' mathematical abilities, the authors came to the conclusion that 10, 15 and 20-minute active breaks improved pupils' mathematical abilities when compared to pupils who did not participate in the experiment. The results also showed that there was no statistically significant difference between physically active periods of four types of duration<sup>9</sup>. The positive influence of physically active breaks on educational achievement is presented by Donnelly et al.<sup>10</sup>, in the comprehensive three-year longitudinal study which included a sample of 1,527 pupils and showed that second and third grade pupils had significantly improved their educational achievements in mathematics, spelling and reading<sup>10</sup>. The study carried on 14 fourth and fifth grades aiming at the observation of the impact which physically active breaks had on mathematics teaching compared to traditional mathematics classes found out that after eight weeks the results of the experimental group were significantly better than the results achieved by the control group<sup>11</sup>. The authors proved that there was a correlation between physically active breaks and educational achievements, which was also confirmed by the research conducted by McClelland, Pitt and Stein<sup>12</sup>. In the research which included 348 pupils aged 7 to 13, they were projecting video recordings containing certain exercises for the incitement of physical activity every day at the beginning of the school day and for a period of 12 weeks. After the conducted study the authors came to the conclusion that pupils improved their reading, writing and mathematical problems solving abilities, especially with those pupils who showed poorer abilities at the beginning of the research.

Besides educational achievements, the research studies including 6- to 12-year-old students often observed the impact of physically active breaks on pupils' attitudes toward physical activity, which is also very important since in the stated period the influence on the timely development of all motor abilities can be mostly influenced. Research has shown that by applying physically active breaks enriched with interactive and to children interesting, three to five minutes long video recordings of various contents can positively influence pupils' attitudes toward physical activity<sup>2,13</sup>. The research<sup>2</sup> showed statistically

significant differences, while the second research<sup>13</sup> obtained results showing positive effects, but without statistical significance. By applying the questionnaire "Attitudes toward the Physical Activity Scale" in the aforementioned research studies, changes in the self-confidence domain could be noticed with those children who had participated in physical activities with video recordings<sup>2</sup>. Moreover, there were positive changes in children's attitude toward the motivation for physical activity, with better pupils' attention and interest for the teaching process, and less signs of restlessness and tiredness<sup>13</sup>. According to the author's knowledge, in Croatia only Podnar<sup>14</sup> applied physically active breaks in primary class teaching. Results showed that 6 to 10-year-old pupils who participated in the experiment systematically increased their focus on the task with a total increase in the level of daily physical activity.

Regarding the fact that today's children spend more and more time in front of screens, it is necessary to use modern technology in the best possible way, implementing it in teaching as an auxiliary means for kinesiological activities<sup>13</sup>. Former research has shown that physically active breaks can have a positive impact on both attitudes toward physical activity and on pupils' educational achievements in the form of more successful mathematical problem solving, faster reading and better results in spelling tests.

However, science has still not given an answer to the question about the optimal duration of the active break, the frequency and intensity which will give the most appropriate effect for pupils. Therefore, the need for further research, primarily in Croatia, is necessary for physically active breaks to be applied in the educational process to their full potential and based on scientific evidence. The object of this paper is thus directed toward the research of the impact which physically active breaks have on the level of pupils' educational achievement and the change of their attitudes toward physically active breaks, all with the use of video materials in physically active breaks during teaching.

Therefore, in this study, we will try to answer the question of whether the use of daily short active breaks, accompanied by video materials during the classroom teaching process, can impact the level of mathematics students' educational achievement and their attitudes toward physically active breaks.

## Methods

### *Participants*

The apposite sample in this research consisted of a total of 38 pupils aged 10 to 11 attending two third grades of a primary school in Rijeka. By a random choice, pupils from a third grade (as many as 19 of them) formed the experimental group which during the intervention period conducted physically active breaks with video materials,

while pupils from the other third grade (as many as 19 of them) formed the control group and did not participate in physically active breaks with video materials.

### *Instruments*

The programme was evaluated so that the impact of physically active breaks with video materials on the educational achievement and evaluation of pupils' attitudes toward physically active breaks was examined.

For the needs of this research, the influence of physically active breaks on the educational achievement was estimated by the percentage of correct answers in tasks of a mathematics test on the topic of "Multiplying and dividing numbers by 10 and 100" and "Written multiplying of a double-digit number by a single-digit number". The first test contained 17 tasks, eight were numerical, and nine textual.<sup>a</sup>

Besides noticing the meaning of various numerical operations, by solving such tasks pupils are trained to apply mathematical knowledge in real life and so develop thinking, attention, and concentration<sup>15</sup>.

The second test done by pupils consisted of seven tasks, of which three were of a numerical type, while four were textual (an example of a textual task: "Nika has baked 10 cookies, while her mother baked seven times her amount. How many cookies did her mother bake?").

To evaluate the attitudes toward physically active breaks with video materials, the Croatian version of the questionnaire Attitudes towards the Physical Activity Scale (APAS) was used<sup>16</sup>. The Croatian version of the questionnaire for the assessment of attitudes toward physical activity consists of 39 items which have to be answered on a scale from 2 to 5. The questionnaire consists of five main factors which are: physical self-concept (Cronbach's Alpha 0.94), importance of physical activity (Cronbach's Alpha 0.89), learning with information and communication technology (Cronbach's Alpha 0.88), physical activity and holistic health (Cronbach's Alpha 0.83) and self-efficiency in physical exercising (Cronbach's Alpha 0.81)<sup>17</sup>. Regarding the fact that the aim of the research was to examine pupils' attitudes toward physically active breaks using video materials during teaching, pupils answered fifteen questions. They answered only the part of the questionnaire which related to the application of video recordings (learning with information and communication tech-

<sup>a</sup> Numerical or tasks with numbers are tasks where numbers are connected by numerical operation signs (+, -, ·, :) and by the relation sign (=). According to Markovac<sup>15</sup>, the purpose of such tasks is to build appropriate numerical techniques because they enable pupils to direct all their attention to the course of performing a certain numerical operation. There were seven simple tasks where the operation is conducted with two numbers, and the task is to find the third (for instance, 7·20), while one task was more complex and contained different level operations (for instance, 8·(4+7)).

Word or textual tasks are, according to Markovac<sup>15</sup>, those where data and the relationship among them are formulated using words which have to be numerically shaped, and by an adequate numerical operation find out the unknown data expressed in a numerical form.

nology and self-efficiency in physical exercising). The questionnaire was filled in at the end of the research by the experimental group only, because the control group did not participate in the physically active breaks.

### *Research design*

The conduction of the research lasted for two months, from 1. April to 3. June 2019. The headmistress of the primary school where the research was conducted, and parents of participating pupils gave their written consent for the participation in the research. The research lasted for two months because it had to be completed two weeks before the end of the school year, so that pupils could prepare for the final tests.

At the beginning of the research pupils took a mathematics test to evaluate the initial situation of pupils' educational achievements. After solving the test pupils continued with further topics and activities in line with the Mathematics syllabus. The experimental class was given video recordings of the duration of three minutes, 11 in total, to be used during teaching lessons as a form of physically active breaks. The content of the videos included basic kinesiological movements from various sports disciplines, such as running, swimming, boxing and strength exercises or stretching. The teacher in the experimental group showed the video recordings to pupils during each Mathematics class (four times a week), during the central part of the lesson (between minutes 20 and 25). The recordings were shown in random order and could be repeated, under the condition that the same video recording should not be shown two days in a row. By imitating the video animations projected on the board pupils were performing various kinesiological activities as mentioned above. The rest of the lesson was conducted according to the regular programme. During the two-month intervention, the control group was not in contact with video materials and active breaks.

### *Data processing*

Data were processed and analysed in the programme STATISTIKA 12.5 (StatSoft, Inc., Tulsa, OK, USA). The results are shown in the form of charts and tables. The basic descriptive parameters were calculated: mean, standard deviation, minimum and maximum. Differences between the initial and final measuring inside the same group were tested by the Student's dependent sample t-test, while for differences between the experimental and control group the Student's independent sample t-test was used. The level of statistical significance was tested with an error of  $p=0.05\%$ .

## **Results**

Table 1 shows means, the lowest achieved result, the highest achieved result, and standard deviations for the experimental and control group at the initial and final measuring of educational achievements in a test. The per-

centage of correct answers at the first test in the experimental group equalled to 80.65%, while in the control group it was higher for only 1.09%. The lowest achieved results differ by 1%, while the maximal achieved results are equal for both groups.

Table 2 shows that in the initial measuring of this difference is still not statistically significant ( $p=0.82$ ).

Regarding the fact that pupils from both classes are taught according to the same syllabus with defined learning outcomes, the fact that there is no huge difference in the initial measuring between groups is not surprising.

Table 2 also presents the statistically significant difference in final measuring which equals to even 29.67%. In the final measuring, the poorest result in the experimental group was 80%, while in the control group it was 35%. In both classes the highest achieved result was 100% which can be seen in Table 1.

This huge difference between groups in the final measuring can be explained by the fact that pupils in the experimental group were using physically active breaks which influenced the improvement of their cognitive abilities, and consequently their attention and concentration to follow lessons in the continuation of the teaching process. Compared to the control group, pupils in the experimental group participated in active breaks four times a week which is the only difference compared to the control group, because the rest of the lesson was the same in both classes. Therefore, pupils in the control group achieved lower results in educational achievement because they did not have physically active breaks during lessons.

As presented in Table 3, the difference in educational achievements for the experimental group in the initial and final measuring is 12.91%, while the standard deviation is significantly lower in the final measuring. This can be attributed to pupils' capabilities which got equal after a regular use of physically active breaks.

Table 4 presents the average values of educational achievements in the initial and final measuring of the control group, and results indicate that in the initial measuring this group achieved better results than in the final by 17.85%.

Poorer results in the final measuring of the control group pupils can be explained by the assumption of a lack of physically active breaks during teaching which pupils were not exposed to. Thus, pupils' attention, concentration and memory during each lesson were not so directed toward the teaching process, which in the end resulted in the fact that after nine weeks they could not remember a certain procedure of task solving.

Table 5 shows the mean and standard deviation results for pupils' answers for each item which examined attitudes of the experimental group toward the video materials used during physically active breaks. The item "I can follow the activity in video exercising with minimal errors and without the teacher" shows the least deviations from the central value ( $SD=0.905$ ), which means that pupils mostly circled the same answer, while the highest deviation ( $SD=1.219$ ) occurred for items "I have learned about music through video exercising" and "I have learned about language through video exercising". This means that for

**TABLE 1**

BASIC DESCRIPTIVE PARAMETERS OF EDUCATIONAL ACHIEVEMENTS FOR THE EXPERIMENTAL GROUP (E) AND FOR THE CONTROL GROUP (C)

Variables	M	SD	Min	Max
Educational achievements (E) INITIAL	80.65	15.93	54.00	100.00
Educational achievements (E) FINAL	93.56	5.39	80.00	100.00
Educational achievements (C) INITIAL	81.74	12.42	55.00	95.00
Educational achievements (C) FINAL	63.89	25.58	35.00	100.00

**TABLE 3**

DIFFERENCES IN EDUCATIONAL ACHIEVEMENTS OF THE EXPERIMENTAL GROUP IN THE INITIAL AND FINAL MEASURING

Variables	M	SD	t-value	p
Experimental initial	80.65	15.93		
Experimental final	93.56	5.39	-3.32	.004

**TABLE 2**

DIFFERENCES IN EDUCATIONAL ACHIEVEMENTS BETWEEN THE EXPERIMENTAL AND CONTROL GROUP IN THE INITIAL MEASURING (I) AND IN THE FINAL MEASURING (F)

Variable	M experimental	M control	t-value	p
Educational achievements (I)	80.65	81.74	-0.23	0.82
Educational achievements (F)	93.56	63.89	4.81	0.00

**TABLE 4**

DIFFERENCES IN EDUCATIONAL ACHIEVEMENTS OF THE CONTROL GROUP IN THE INITIAL AND FINAL MEASURING

Variables	M	SD	t-value	p
Control initial	81.74	12.42		
Control final	63.89	25.58	4.25	0.0003

TABLE 5

## BASIC DESCRIPTIVE PARAMETERS OF EXPERIMENTAL GROUP PUPILS TOWARD VIDEO MATERIALS

Variables	M	SD
I have learned about CULTURE through video exercising	4.21	1.084
I have learned about MUSIC through video exercising	3.53	1.219
I have learned about ART through video exercising	3.53	1.172
I have learned about MATHEMATICS through video exercising	3.37	1.165
I have learned about LANGUAGE through video exercising	3.53	1.219
I have learned about WRITING through video exercising	3.26	1.147
I have learned about COMPOSITION through video exercising	3.37	1.065
I have learned about HEALTHY LIVING through video exercising	4.21	1.084
I have learned about HEALTHY DIET through video exercising	3.47	1.124
I have learned about HYGIENE through video exercising	3.63	1.116
I have learned about ENVIRONMENT PROTECTION through video exercising	3.32	1.157
I can choose an activity which suits me in video exercising.	4.32	1.003
I can follow activities in video exercising.	4.21	1.032
I can follow the activity in video exercising with minimal errors and without the teacher	4.47	0.905
I know which video exercising activity is my favourite.	4.21	0.976

these items pupils had the largest number of different answers.

The mean has the lowest value 3.26 for the item “I have learned about writing through video exercising,” while the highest value of 4.47 is for item “I can follow the activity in video exercising with minimal errors and without a teacher.”

This indicates that most pupils do not agree with the statement that through video exercising they have learned something about writing, but most of them agree with the statement that they can follow activities with minimal errors. This means that pupils are independent during exercising, and that they can choose the video recording which mostly suits them alone, and then perform it safely and without errors in the motor performance. Besides, a large number of pupils answered that through exercising with video materials they have learned about healthy living and culture in general ( $M=4.211$ ).

## Discussion

The results obtained by the research indicate the direct impact which physically active breaks have on pupils' educational achievements. The aforementioned is extremely supporting for teachers in the context of their directing the teaching process toward pupils as active participators of the same. In research Murtagh, Mulvihill and Markey<sup>18</sup> emphasize that in the time when the increase in the level of pupils' physical activity is advised, while at the same time the syllabus by which pupils have to achieve the best possible educational success is imposed, active breaks represent an incitement. The obtained results show the sig-

nificant role of short physical exercise activities in the pupils' attainment of better educational achievements.

The initial measuring in the experimental and control group did not show huge differences in the groups' educational achievements, which is not surprising when it comes to the fact that they are taught according to the same syllabus. The final measuring results indicate that the ability to solve mathematical tasks in the experimental group has significantly improved in the experimental group when compared to the control one. This research results are in line with the results obtained in the research conducted by Vazou and Skrade<sup>11</sup>, where the experimental group pupils' mathematical achievements significantly improved after eight weeks of physical exercise activities during mathematics classes. Although not to the same extent, the mathematical abilities of pupils who participated in the research conducted by authors Maeda and Randall<sup>5</sup> also improved, which indicates that short physically active breaks have an impact on pupils' intellectual work.

Physically active breaks influence the pupils' behaviour, concentration, attention and focus<sup>13</sup>. Therefore, the measuring results conducted at the end of research in the experimental group are not surprising and indicate the fact that pupils achieved significantly better results in solving mathematical tasks than in the initial measuring. Lower deviations of the central value in the final measuring ( $SD=5.39$ ) when compared to the initial ( $SD=15.93$ ) indicate that the group got homogeneous, i.e., that their mathematical abilities became similar during the intervention period due to the fact that the same physical exercising activities were performed with all pupils, and at

the same time. These results have been confirmed by Maeda and Randall<sup>5</sup>, in a research where, according to the teachers' subjective assessment, after the period in which they performed short physically active breaks four days a week, they were able to solve a larger number of tasks and perform a larger number of anticipated activities in a school day, all thanks to better concentration and attention.

Although the control class achieved somewhat better results than the experimental one in the initial measuring, this did not repeat in the final measuring. It is concluded that the reason for this is that they lacked additional physical activity necessary for cognitive improvement. Pupils need a break from cognitive effort, so it is not only necessary to change cognitive tasks and teaching methods to improve productivity and increase the class dynamics. As Findak<sup>19</sup> claims, the most effective rest from intellectual labour is the one where we are physically active.

By analysing the results, it can be concluded that most of the pupils are aware of their possibilities, and they know how to choose their favourite physical video activity and follow it. A large number of pupils agree with the statement "I have learned about healthy living through video exercising" which is not surprising regarding the fact that pupils, through physical exercising activities which they performed with watching video materials, could discuss the importance of movement and so understand that even physically active breaks are significantly useful for the organism. Agreement or disagreement with statements like "I have learned about art through video exercising," "I have learned about mathematics through video exercising," "I have learned about language through video exercising," "I have learned about writing through video exercising," or "I have learned about composition through video exercising," can encourage that in future video materials more attention should be paid to the topic of a certain video recording, not only to the content of the physical activity. For example, a video recording could be made which would pay more attention to the preparation of food using various food, so pupils will learn more about healthy diets through video exercising, while the other one will focus on physical exercising activities using some terms not yet acquired by pupils, so they will learn more about language. Glapa et al.<sup>2</sup> came to the conclusion that pupils who participated in the research and used HOPSport Brain Breaks video recordings have learned a lot about music, art, mathematics, healthy diet and healthy living through video exercises, which can be an incitement for creative solutions in designing video materials to be used in exercising. In a research conducted in Turkey, they have examined pupils' attitudes toward physical activity using the same questionnaire used in this research (APAS)<sup>20</sup>. Researchers have come to the conclusion that HOPSport Brain Breaks video animations had a positive impact on pupils, making them more self-confident and responsible toward their personal health.

Popeska et al.<sup>13</sup> advise that such video materials should not only serve the physical activity purpose but should be

integrated in other subjects teaching. For example, the video recording can have in its background the traditional music of an area, and thus be linked to Music teaching, or it could contain elements of a sport taught to pupils in Physical Education classes. The same authors suggest creating video recordings where both pupils and teachers will take part and so develop creativity and collaboration. The use of technology in teaching makes possible a more effective conduction of certain activities, which is especially important to teachers since by projecting video materials, which are visible and clearly projected over the computer, they do not have to perform the movements themselves.

This paper proves the importance of physically active breaks in the teaching process. The results have shown that 3 to 5-minute physical activities between intellectual efforts significantly influence the pupils' attention, concentration, thinking, memorisation, and consequently the level of educational achievements<sup>13,21</sup>. Pupils' attitudes toward exercising with video materials indicate the importance of applying modern technology in the teaching process, as well as the necessity of raising teachers' consciousness about the positive side of its purposeful implementation in the teaching process. Video materials such as these used in the research or the HOPSport Brain Breaks programme promote physical activity among pupils in a completely new, interesting, entertaining, and attractive way<sup>2</sup>. It is important to mention that video recordings' contents should nevertheless be appropriate for pupils' interests, possibilities, and age<sup>22</sup>. The research proved that pupils increased their daily physical activity which can only have positive future repercussions on their health and physical appearance. Besides being useful to pupils, the fact that physically active breaks can go on in a classroom environment, next to the school desk, and that they do not require a special training for the person showing them and are not time-consuming during lessons, should be an additional motivation for teachers to apply them during the teaching process.

This research is a path to new future works dealing with the topic of physically active breaks during teaching. The limitations and flaws of the research are manifested in the small number of examinees and the lack of monitoring of the level of pupils' physical activity during the day. For wider, and at the same time more quality results it would be necessary to include a larger number of examinees which would include primary schools throughout the Republic of Croatia, and surely prolong the period of interventions.

## Conclusion

The conducted research can lead to the conclusion that physically active breaks have a significant influence on pupils' educational achievements and on pupils' attention, concentration, and cognitive processes, which eventually contributed to the more successful test results. The research has shown that physically active breaks have a positive influence on pupils' attitudes toward physical activity, because in an entertaining and new way they show

the possibility of participating in physical activities which can positively influence pupils' health and the quality of their life. Results have proved that besides the fact that pupils can independently, correctly, and safely perform physically active breaks with video materials, they also have the possibility of acquiring knowledge about culture and healthy living in general.

This paper's results are very important for the teaching and the whole educational process because they reveal how much physically active breaks, and physical activity in general, are important for the attainment of educational achievements. What is more, the fact that they change pupils' attitudes toward physical activity, make them in-

dependent and contribute to culture and the creation of healthy and active living habits, speaks in favour of physically active breaks and their significant influence on the quality of pupils' lives.

It can be concluded that the application of physically active breaks is possible in the teaching process and is surely advisable regarding the possibility of its integration into teaching and the realisation of inter-curricular and cross-curricular correlation. At the end, it is important to emphasize that implementation of physically active breaks into teaching has an impact on pupils' productivity in the educational process, while at the same time their need for movement is fulfilled.

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## **TJELESNO AKTIVNI ODMORI U NASTAVI: UTJECAJ NA OBRAZOVNA POSTIGNUĆA UČENIKA**

### **SAŽETAK**

Cilj ovog istraživanja je utvrditi utjecaj tjelesno aktivnih odmora uz video materijale, na razinu obrazovnih postignuća učenika i njihove stavove prema tjelesno aktivnim odmorima tijekom nastavnog procesa u razredu. Istraživanje je trajalo dva mjeseca, a prigodni uzorak činilo je ukupno 38 učenika u dobi od 10 do 11 godina. Utjecaj tjelesno aktivnih odmora na obrazovna postignuća procijenjen je postotkom točnih odgovora iz matematičkih zadataka, dok je hrvatska verzija upitnika o stavovima prema tjelesnoj aktivnosti (APAS) korišten za procjenu stavova prema tjelesno aktivnim odmorima uz video materijale. Razlike između početnog i završnog mjerenja unutar iste skupine procijenjene su Studentovim t-testom za zavisne uzorke, dok je za razliku između eksperimentalne i kontrolne skupine korišten Studentov t-test za nezavisne uzorke. Dobiveni rezultati pokazali su da se sposobnost rješavanja matematičkih zadataka u eksperimentalnoj skupini značajno poboljšala u usporedbi s kontrolnom, te da tjelesno aktivni odmori imaju pozitivan utjecaj na stavove učenika prema tjelesnoj aktivnosti. Provedba tjelesno aktivnih odmora u nastavi utječe na učinkovitost učenika u obrazovnom procesu te ujedno ispunjava i potrebu učenika za kretanjem.