

THE USE OF EXERGAMES AS TEACHING METHOD IN MOTOR ACTIVITIES

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Abstract: Nowadays video games and IT are main sources of information and spending free time for more and more adolescents creating dependence and being highlighted as a risk factor regarding physical inactivity and obesity. New trends and research found a way to change 180 degrees the negative view of sedentary video games and mixt up video games with sports activities and developed "the exergames" a new way to practice sports exercises through video projections and video games. Our study purpose was to analyze the opinions and perceptions of Romanian Physical Education teachers about the new ways of practice sports activities with "the exergames", the reasons for using this method, the benefits, and obstacles. The research had as experiment sample 58 Romanian Physical Education teachers with different ages, gender, and experience, the method of research used for this experiment was the questionnaire with closed and open questions. The results of the questionnaire showed that the majority of Romanian Physical Education teachers don't know about video games involved in sports activities but are open minded regarding new ways of teaching, the reasons for the pro-attitude for introducing these ways involve: they encourage youth to practice sports doing what they like and generating joy with different kind of exercises. Conclusions of our study highlighted the need for rethinking the ways of teaching Physical Education and Sports activities in Romanian educational system, innovating and be open minded.

Key words: electronic devices, computer sports games, sports training, physical education

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INTRODUCTION

Scientific research recommends that reducing sedentary lifestyle among children and adolescents is a priority in combating and preventing obesity, identifying as negative impact elements watching television and playing videogames (Rosenberg et al., 2008). Other research articles proved that among people that live a sedentary lifestyle appears the greater risk of sickness comparing with those that have an active lifestyle and participate in motor and sports activities (Sieverdes et al., 2012). Nowadays video games gained popularity among the youth population but

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it is also present in adults and middle-age population lifestyle due to the progress of technology that surrounds us everywhere (Brach et al., 2012). The novelty of our research comes from changing the idea that video games are absolutely negative elements in youth lifestyle and presenting the new generation of interactive video games that are able to improve sports capacity simulating physical exercise and different sports activities.

Modern civilization brings new technology and learning methods offering good opportunities for developing skills and socializing, scientists researching the role, efficacy, and opportunities that this digital environment has to offer (Soltani and Vilas-Boas, 2017). Though research articles presented many reasons for physical inactivity such as lack of time and skills for practicing PE, lack of capable PE instructors, lack of support may influence the quality and quantity of PE activity (Lindberg et al., 2016).

Nowadays technology tried to imply physical interaction between the user and the device so the game industry and game controllers facilitate this kind of interaction developing technologies like Wii Balance Board and Microsoft Kinect. These kind of technology were the basic step for developing new kind of movement interactive games named exergames – games with exercises (Yoosin and Yang, 2010), is an alternative to the static traditional video game the influenced the sedentary behavior (Staiano and Calvert, 2011).

Exergames are a new entertaining alternative to the traditional PE lessons that has evolved rapidly in this digital and interactive era, having incorporated exercises with the main purpose of increasing physical activity and reducing sedentary lifestyle habits (Nani et al., 2018).

The benefits of exergames were presented in many research investigations proving the beneficial for both mental and physical health of anyone who practices exergames (Staiano and Calvert, 2011; Baranowski et al., 2012).

PE pedagogy always tried to innovate its teaching methods and keep up with new emerging technology including into their lessons visual or audio stimulus. Video games can fulfil both visual and audio stimulus and can be applied to improve attention, executive functions, and reasoning (Neugnot-Cerioli et al., 2015). Exergames characteristics are based mainly on control, rhythm, machines, workout, or sensory parameters being linked to a much bigger movement category of games that promote and maintain health (Brox et al., 2011; Lee, 2012).

Some other research proved that exergaming, through their engaging and encouraging values, can develop physical activity levels of youth, discovering that due to the complex connection between physical exercises and electronic games PE can be an entertaining and fun activity. Also among exergaming proprieties, researchers affirm the following: can increase motivation for participating in motor and physical activities and can improve and maintain health in a realistic environment (Peng, 2011).

Specialists designed exergames to offer real-time augmented information with a measurable effect and variable of interest (reaction time, force) providing related information to the user (Giggins and Persson, 2013).

Regarding sedentary individuals' scientists discovered that exergames are mounting evidence for developing an active lifestyle and increasing physical activity through video game play physical elements that imply exercise and motor activity, increasing both health and exercising motivation for performance (Rosenberg et al., 2008; Song et al., 2010).

The purpose of the research was to present a new way in teaching physical education and to identify the knowledge existing in our country in this direction and also to ask the physical education teachers their opinions and their suggestions about exergames effects on the human body.

Our research started from the assumption that exergames have a good influence on the human body, increase the body resistance, and also life satisfaction, enthusiasm, fun, and positive emotions, developing also relationships and building cohesion, being a new way to practice sport and also fulfill many physical education aims.

PURPOSE

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HYPOTHESES

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MATERIALS AND METHODS

The research had as methods the questionnaire of opinions with the main aim to know the opinions of the physical education teachers about exergames and their influence on the human body. The questionnaire was built on a five scale fixed answer giving the opportunity of choosing the level of accordance with the affirmations or to choose between variants of answers. The responses were based on the statements of our research sample using a five-point scale. The next step we coded the responses and introduced the data in the program SPSS 22.0, after which we statistical processed the data and we created tables, graphics, and conduct de analyses. The following step was to use the results to create descriptive information and cross-table analyses. The results of our investigation are presented in the results section. This investigation was performed in accordance with the Declaration of Helsinki (2013) and approved by the Ethics Committee before the commencement of the study. It also met the ethical standards for Sport and Exercise Science Research.

Sample of the research

In our research, we had a number of 58 physical education teachers with different teaching grade, age, and gender. As we can see in figure 1 – regarding the gender of the responders, the sample of teachers was formed from 32 male respondents, representing 55% from the total, and 26 female respondents, representing 45% from the total. All the participants to survey gave their written consent for analyzing and presenting their responses for our research study and to be public released.

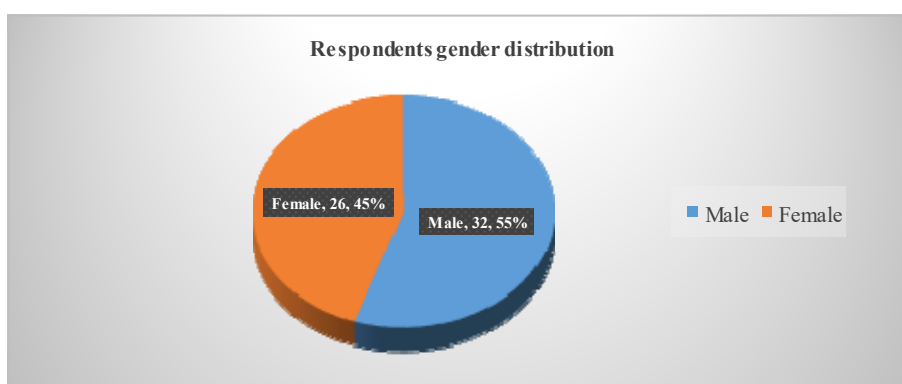


Figure 1. The distribution of the respondents regarding their gender

Regarding the age of the respondents we had 18 teachers under 25 years old, representing 31.03% from the total; 12 teachers between 25-30 years old, representing 20.69% from the total; 14 teachers between 30-35 years old, representing 24.14% from the total; 10 teachers between 35-

40 years old, representing 17.24% from the total; and over 40 years old we had 4 teachers, representing 6.90% of the total (figure 2).

As for the degree that teachers from our research sample had we can observe the following: 10 teachers, representing 17.24% from the total, had no teaching degree; 32 teachers, representing 55.17% from the total, had the definitive degree; 12 teachers, representing 20.69% from the total, had a second degree in teaching; and 6 teachers, representing 10.34% from the total, had the first degree in teaching (figure 3).

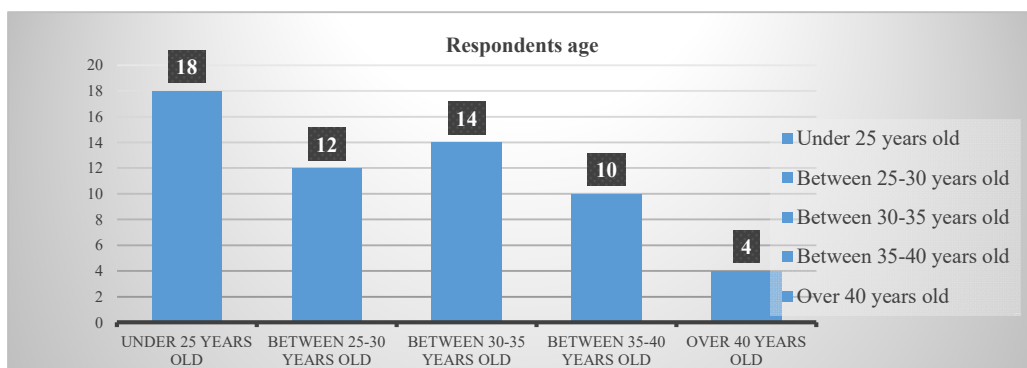


Figure 2. The distribution of the respondents regarding their age

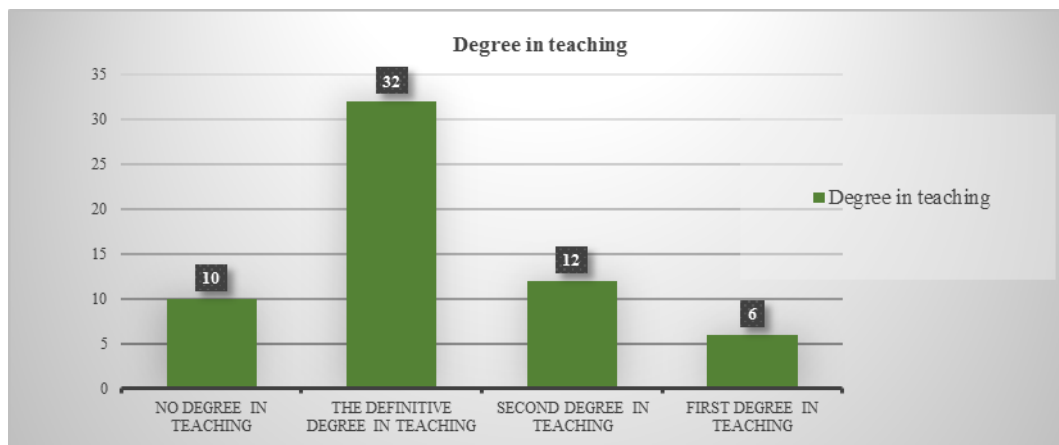


Figure 3. The distribution of the respondents regarding their degree in teaching

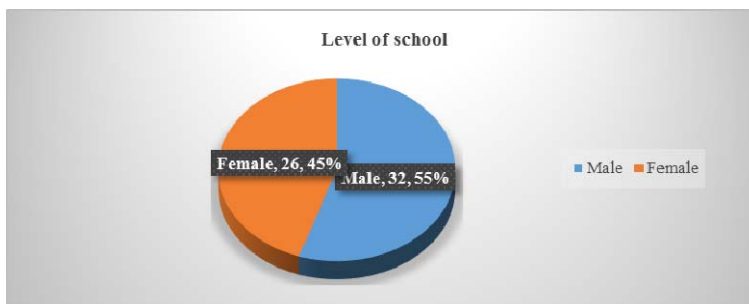


Figure 4. The distribution of the respondents regarding the level of school

Regarding the level of education school we had 42 teachers, representing 72.41% from the total amount, that activate in the gymnasium schools; 13 teachers, representing 22.41% from the total, that activate in the high school and 3 teachers, representing 5.17%, activate at the university level (figure 4).

RESULTS

The next phase of our research was to gather the information and answers from our respondents and to interpret the results of our investigation. The result of the research was as follows:

At the first item of our questionnaire we asked our respondents if they are familiar with exergames, WII, kinetic or interactive IT movement games, and the answers were as follows: 39 respondents, representing 67.24% from the total, heard about this kind of interactive IT movement games as an alternative to classic physical education classes; 19 respondents, representing 32.76% from the total, never heard or saw something like exergames.

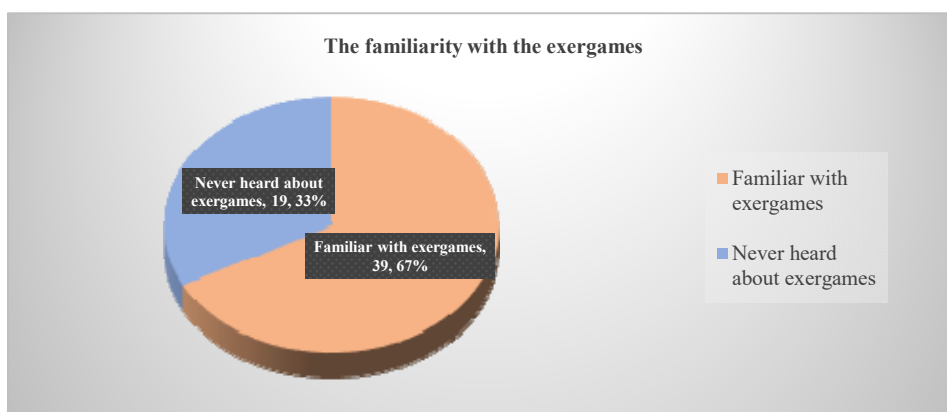


Figure 5. Item No.1 – The familiarity with the exergames

At the second item, we asked our sample of teachers on what activities they think exergames would be suitable for use. We can see in Table 1 the responses of our sample: at the first point the usage of exergames as an extra-curricular or optional activity the majority of the respondents give five points to the extra-curricular or optional activity; at the usage of exergames as a way to improve physical training activity the majority of the respondents give a middle 3 point; as for the usage of exergames for recovery activity the majority of the respondents give maximum points; for the motor learning usage of exergames the majority give 5 points; and also for the usage of exergames for disability students the majority of the respondents give 4 points.

Table 1. Item 2 the usage of exergames

Name of the activity suitable for exergame usage	1	2	3	4	5
1. Extra-curricular or optional activity	1	3	4	8	42
2. Physical training	2	8	23	15	10
3. Recovering activity	0	6	6	16	30
4. Motor learning	3	5	7	20	23
5. Exergames for disability students	7	10	13	20	8

At the third item we ask our sample of teachers to choose between five variants of answer (no potential, some potential, considerable potential, good potential, and huge potential) for the current statement: “exergames have the following potential in using it in physical education and sport classes”, the answers of the questionnaire were as we can see in Figure 6: the majority of teachers consider exergames having a good potential (28 of them representing 48% from the total) or a considerable potential (20 of the respondents representing 35% from the total), few respondents see a huge potential (3 respondents) and also few see some potential (6 respondents) and just 1 of the respondents affirm that exergames have no potential at all.

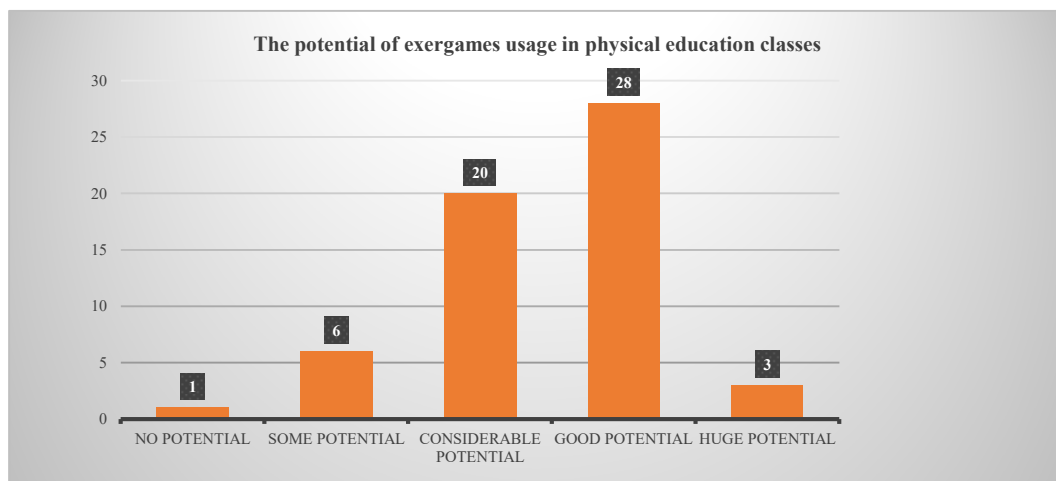


Figure 6. The potential of exergame usage in physical education classes

The next item of our questionnaire asks the teachers to choose between no potential and potential of exergames in the following direction: maintaining health and physical condition, encourage the physical activity of students, improve social relationships, learn or adapt to new motor learning exercises, psychological relaxation and having fun. The answers were as separated on gender (Table 2), as we can observe little differences between the gender have occurred the majority in each case see a good potential in all the direction proposed the differences between genders being insignificant statistically.

Table 2. The potential of exergames

The potential of exergames in the following direction:	Gender distribution			
	Women (n=26)		Man (n=32)	
	No potential	Good potential	No potential	Good potential
1. Maintaining health and physical condition	2	24	0	32
2. Encourage physical activity of students	0	26	1	31
3. Improve social relationships	4	22	1	31
4. Learn or adapt to new motor learning exercises	2	24	2	30
5. Psychological relaxation and heaving fun	1	25	1	31

At the final item of our questionnaire, we ask the sample of respondents to choose on a scale (from 1 to 5) the possibility of using the exergames in their physical education classes. The

answers to this item (Table 3) show that teachers would use this kind of materials but the majority have no space, funds or knowledge, but have a good attitude towards new ways of practicing sport and attracting their students to interesting activities.

Table 3. The possibility of using exergames in the physical education classes

The motives for using or not the exergames to the physical education classes	1	2	3	4	5
1. Sufficient of insufficient space for the good use of exergames	38	10	5	4	1
2. Financial or no financial support from the school	43	5	3	5	2
3. The limited time of the physical education classes	23	10	11	8	6
4. Knowledge about using the exergames	15	10	7	8	8
5. My attitude toward using this kind of activities	3	5	10	18	22

DISCUSSIONS

The results of our investigation show that most of the teachers that were part of the research sample are familiar with exergames and some of them even used the technology. Regarding the usage of this new technology, the majority of our respondents think that exergames are a good way of spending time for extra-curricular or optional activities, recovering activity and for motor learning, also some of them think that these games are good for physical training and to help students with disabilities.

Similar results of a positive influence of exergames were found in other scientific research that scientifically demonstrated that people that involved in digital interactive games with use of physical exercise provide significant improvement in heart rate, increase of oxygen uptake and energy consumption being similar to traditional physical education exercise effects (Peng et al., 2011).

Other similar results of our investigation regarding the potential of exergames in using them in the physical education lessons show that the respondents in our sample group consider that this kind of exercise has a good potential or considerable potential and also contribute to maintaining health and physical condition, encourage physical activity, improve social relationships, learn new motor skills and also use them for psychological relaxation and having fun.

Some scientific research papers discovered that exergame programs develop life satisfaction (Wang et al., 2008), socialization, enthusiasm, entertaining, fun and positive emotions, giving the opportunity and motivation for practicing physical exercise (Patsi et al., 2012; Bianchi-Berthouze et al., 2007).

Besides its numerous physical benefits, exergaming have also many social benefits being an important argument for physical education teachers for implementing this kind of video methods in their curriculum fulfilling the pedagogical principles and methods requirement.

According to scientific researcher Sinclair et al. (Sinclair et al., 2007), exergames are a practical method for combating sedentary and decelerate obesity at people with “increased screen time and decreased physical activity”. Also, the majority of the research emerges the idea that exergames are focused on energy expenditure and physical outcomes being associated with improving heart rate and caloric expenditure in its exercises (Duncan and Dick, 2012; Smallwood et al., 2012).

Other researchers discovered that the interest for exergaming increased for usual fitness lessons and the elementary school children increased also their motivation for participating in physical education classes that use exergames (Sun, 2012; Garn et al., 2012). Also, the benefits of using Run Wii Fit were discovered by many scientists that concluded that exergames improve the motivation of obese youth for practicing physical activities.

Other researches highlighted that new technologies can have major impact on sports training and psychomotor development (Szabo et al., 2019a) but also can have negative impact on

physical health being mandatory to use prophylaxis sports like swimming (Szabo et al., 2019b).

The motor activities, whether organized, the physical education and sports lessons, or sports training, either free or competitive, have at this age a strong ludic character, aiming both at developing motor skills physical and social skills (Sopa et al., 2018).

Also, our research shows that teachers would use this kind of materials but the majority have no space, funds or knowledge, but have a good attitude towards new ways of practicing sport and attracting their students to interesting activities.

The limitations of our study

The prior limitation of our study was the number of participants to the study, we had the responses of only 58 PE teachers from Romania. Another limitation was the level activity of our respondents we accepted PE teachers only from the gymnasium and high school but in near future, we want to apply the questionnaire also at the primary school level and university physical education. Also, the method that we applied, the questionnaire method, has its limitation and could not sum all the opinions of our sample.

CONCLUSIONS

The purpose of our investigation has been to describe the perceptions of PE teachers from Romania for using the exergames. We also wanted to examine the possible obstacles, difficulties, and reasons that PE teachers from our country use or don't use exergames as a teaching method.

The results showed that PE teachers from Romania are familiar with exergames, Wii, kinetic or interactive IT movement games, the majority of our respondents 67.24% heard about this kind of interactive IT movement games as an alternative to the classic PE classes. Also, our respondents consider that exergames are a suitable extra-curricular or optional activity offering most of their maximum votes. As for the usage of exergames as a way to improve physical training the PE teachers are not 100% convinced that exergaming is an effective method and consider them to be more of a recovery, relaxing and motor learning way to use.

The results of our questionnaire showed that PE teachers consider that exergames have good potential or a considerable potential for using as a method of teaching in PE lessons. Also consider that exergames have good efficiency in maintaining health and physical condition, encourage the physical activity of students, improve social relationships, learn or adapt to new motor learning exercises, psychological relaxation and having fun.

Even if the PE teachers recognize that exergames are a proper method for fulfilling the objectives of PE lessons the answers of the last item in our questionnaire show that Romania is not prepared to use new technology because of insufficient space, no financial support, limited time and little knowledge to use this method, although their attitude towards using new methods of teaching is open.

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