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INFLUENCING MOTIVATION AND MOTORIC PERFORMANCE THROUGH MOBILE APPLICATIONS IN PHYSICAL EDUCATION

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Abstract

In the research, we focused on solving the problem of whether specific selected mobile applications for supporting physical activities may influence pupils' motivation to improve their motoric performance. The research questions were: Can specific applications affect the level of motivation among pupils in the selected subject? Can specific applications affect the level of motoric performance among pupils in physical education? The research design used was experimental based on the following research methods: the UNIFIT 6-60 standardized motoric performance test and the SIMS questionnaire, which measures the motivation of an individual in 4 motivational subfolders. The research took place between March and May 2018 in the form of 10 modified lessons of physical education. A total of 238 respondents aged 11-16 participated in the study. The implemented pedagogical experiment did not show quantitatively different results between monitored groups on the basis of standardized UNIFIT test of motoric performance. Only the SIMS test resulted in experimental group's lower amotivation. The amotivation component showed a statistically significant difference between these groups. As a limiting factor we consider the realization time - 3 months. We assume that positive influence of using technology in Physical Education would be reflected in longer-term use.

Keywords: Physical education, motivation, mobile applications, smartphone.

1. Introduction

Physical activity among the young generation has seen a drastic decline. On the other hand the use of smartphones, in everyday work and free time, has increased. Health risks connected with lack of movement is connected with higher costs for treatment of cardiovascular, metabolic and oncological diseases. Many researchers have become increasingly interested in the possibilities and influence of mobile technologies on human health in all its components.

The potential of smartphones thanks to possibility in installing specific applications, is huge. Mobile applications that remind their users necessity to move, is increasing and the possible support to motivate physical activity at every age is obvious (Stephens & Allen, 2013). Our research focuses on free selected applications from Android, available on Google Play. This platform is most accessible for children aged 12 -15, according to results of Palička et al. (2017). Many authors have dealt with the research on physical activity and the factors for its decline; nevertheless, there is a lack of research on the use of mobile phones as the source for this decline. Lubans et al. (2014) recommend investigating the school as an ideal place for physical activity support as a large number of young people are concentrated there with specially qualified personnel working there here.

2. Problem Statement

Media and technology has developed to such an extent that and today´s children watch screens 24 hours daily, at home and at school. We live now in a completely new environment; technology influences social, emotional, physical and cognitive evolution (Uhls, 2015). This has caused a serious decline in physical activity among children and there is little research on how mobile applications can reverse this trend. Through this investigation, this study hopes to provide more information in this important area.

3. Research Questions

Based on research problem, the following research questions were formed;

3.1. Can specific mobile applications affect the level of motivation among 2nd degree pupils in the selected subject?

3.2. Can specific mobile applications affect the level of motoric performance among 2nd degree pupils in Physical Education?

4. Purpose of the Study

The aim of this study was to find out whether specific mobile applications would influence the level of motivation for physical education and the level of motoric performance among pupils of the 2nd grade of elementary school.

5.   Research Methods

The main purpose of this 3 month research was to recreate the same content of 10 various physical education lessons in various ways for control and experimental groups in a pedagogical experiment. The control group was taught in the traditional way, where the teacher plays the role of main activator allowing the pupils find new learning materials, while he controlled the adoption of important points and technics of individual physical activities and sports. The experimental group in contrast obtained all the information with help their smartphones, where specific mobile applications were installed corresponding with the content of teaching. The teacher in the experimental group played only the role of mediator. The teacher only divided pupils into groups but he did not control the lesson after that. He only looked after the safety of the group.

5.1. Research sample

The research was conducted through 3 months, between March and May 2018. All participating pupils were 2nd degree Elementary School in Jaroměř, Na Ostrově middle-sized school in eastern Bohemia, comprising 500 pupils. 237 pupils including 120 boys and 117 girls participated in the research. Probands' age ranged from 12 to 16 years. All participants were ethnic Caucasian. The control and experimental groups were determined by drawing lots. The experimental group totalled 118 probands; 70 boys and 48 girls. The control group totalled 119 probands; 50 boys and 69 girls. Both groups had during the whole pedagogical experiment the same content of 10 Physical Education lessons. The difference was only in the methods of delivering this content.

5.2. Research Methods

The basic method used was the pedagogical experiment. Partially used methods included:

- *UNIFIT TEST 6-60*
  Heterogeneous testing battery for measuring motoric level of probands at the age of 6-60 years (Měkota & Chytráčková, 2002), being standardized in the Czech Republic. It consists of 3 compulsory and one selected items according to sex and age:
  - Test 1 – Jump up /dynamic strength test of Lower legs/
  - Test 2 – repeated crunches in a minute /test of endurance force power of abdominal muscles and loin – hips – thigh muscles/
  - Test 3 – Beep Test (Beep Test /endurance shuttle run, measuring reactions of cardiovascular system by heightening load)
  - Test 4 - relative according to sex /girls -keep in bowing down, boys- repeated bowing down
- *SIMS questionnaire (The Situational motivation Scale)*
  The questionnaire follows situational motivation for activity. Although the questionnaire has not been standardized in the Czech Republic, it is reliable as it has been standardized in

English speaking countries. SIMS contains 4 different scales, according to regulation measure of behaviour.

- o Intrinstic regulated behaviour
- o Identified regulation
- o External regulation
- o Amotivation (without regulation)

Each scale includes 4 items, which gives 16 items in total for SIMS.

6. Findings

The pedagogical experiment was used as the basic research method to determine differences between control and experimental groups. For this reason, all entered data for the control and experimental groups were analyzed at the very beginning using ANOVA, T-test, Mann-Whitney test. No statistical significant differences were found in any of observed transformations. In this way, the ~~entering~~ initial condition of the experiment was ensured. The obtained data were analyzed using statistical software NCSS 10 and basic descriptive statistics were used. ANOVA followed by students' T–Test and nonparametric Mann-Whitney Test were used to test for differences as the obtained data did not quite correspond to normal division with regard to the size of both sets. For analysis, the basic zero hypothesis /HO/ was used, so that we do not presume statistical significant differences in average values of individual ranges by control and experimental groups. A significance level of $p=0.05$ was set. The resulting values of individual ranges after intervention are shown in Table 01.

Table 01.   Descriptive statistics post tests

Variable	Mean	Standard Deviation	Minimum	Maximum	Range	Median	Modus
E Identificated regulation	22,0	5,83	0	28	28	24	28
C Identificated regulation	22,3	4,34	8	28	20	23	-
E External regulation	22,4	5,44	0	28	28	24	28
C External regulation	16,7	5,31	4	28	24	16	14
E Amotivation	16,1	5,34	0	28	28	16	16
C Amotivation	11,1	4,87	4	23	19	11	10
E BEEP	12,5	4,71	0	22	22	11	-
C BEEP	32,2	16,73	9	80	71	28	19
E Sit-ups	30,3	15,00	12	79	67	26	20
C Sit-ups	34,4	9,61	13	60	47	34,5	30
E Jump up	34,8	10,03	3	63	60	34	30
C Jump up	163,6	30,27	110	241	131	160	159
E Shuttle run	164,4	27,86	101	250	149	162	145
C Shuttle run	12,8	1,39	10,24	17,21	6,97	12,38	12,34

Results of individual quantities at control and experimental groups are seen in Table 2.   Critical value for Students' T-Test was t crit = 2.0555.

Table 02. T-test and Mann-Whitney test

Variable	t	Z	H_0
Intrinstic regulated behaviour	0,1067	-0,3495	Accept
Identified regulation	-0,1274	-1,0080	Accept
External regulation	0,7853	0,2127	Accept
Amotivation	**-2,0772**	**-2,2208**	**Reject**
BEEP	0,9059	-0,7891	Accept
Sit-ups	-0,3030	0,4967	Accept
Jump up	-0,1838	-0,4885	Accept
Shuttle run	-1,0226	-1,2477	Accept

t_{crit}= 1.9804
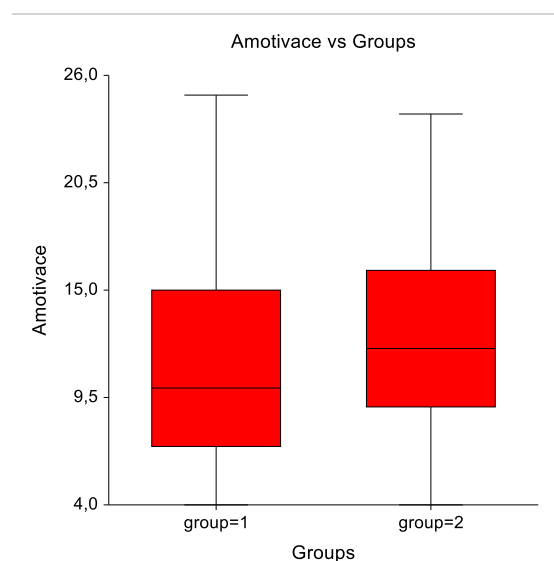
Figure 01. [Amotivation vs Groups]
Box plot for variable Amotivation (Group 1 – experimental group, group 2 – control group)

7.   Conclusion

Measurement results after 3 months of intervention show that no significant differences were detected between the control and experimental groups in observed variables. The only statistically significant difference between experimental and control groups was found in the SIMS item for amotivation. Amotivation is a state when an individual is quite passive and is resigned to the fact. The individual does not try to change because he doubts his own effort. The experimental group showed lower amotivation, which means that individuals in this group participated in physical education with greater interest than before. This finding is very inspirational.

In future research, the study could include discussions among participating students. The results of both tests, the UNIFIT Test 6-60 and the SIMS in the experimental groups showed a positive trend; nevertheless, none of research questions could be given positive answers. However, one limitation of this study, the duration of only 3 months could have contributed to the results. Still, we can assume that the positive use of technology in physical education would show more positive results in a long term study as average values indicated a positive trend in all tested items of motoric performance.

Acknowledgments

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