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Original Article

Impact of tablet-based circuit training on attitudes and intentions of primary school pupils regarding physical activity and exercise

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Abstract:
Problem statement: The effects of tablet use in school Physical Education (PE) on psychological factors related to pupils' physical activity and exercise have been little investigated to date. In particular, the potential impact of tablet use during the PE course on pupils' attitudes and intention towards participation in physical and exercise activities in their free time outside school has not been addressed yet, although, as suggested by the research literature, these attitudes and intentions may positively predict pupils' actual participation in free-time physical and exercise activities. **Purpose:** This study aimed at utilizing tablets as a means for conducting a circuit training course in Physical Education, and at investigating its impact on pupils' attitudes and intention towards participating in sport and physical activities outside school. **Methods:** Sixty-one pupils (aged 9-10 years) were randomly divided into an experimental group (30 pupils) and a control group (31 pupils). The former participated in a two-hour circuit training course, in which they used tablets, a circuit training mobile application and animations of various exercises. The latter participated in an equivalent conventional circuit training course without tablets. Both courses involved seven stations, and were taught by the same PE teacher. Before and after each course, pupils completed anonymous questionnaires. **Results:** The data analysis showed that the tablet-based course yielded more positive pupil attitudes and stronger pupil intention towards participating in sport and physical activities outside school than the conventional course. **Conclusions:** Thus, tablet-based circuit training within school Physical Education may mobilize pupils in relation to getting physically active outside school.
Key Words*:* **ICT-based training, mobile devices, circuit training applications, animation, physical education**

Introduction

School pupils are increasingly attracted to Information and Communication Technologies (ICT), whereas the age at which children gain access to mobile devices (e.g. mobile phones, tablets) and applications for mobile devices is decreasing (Kabali et al., 2015; McManis & Gunnewig, 2012; Nasriah et al., 2019). Mobile applications often engage pupils to activities which, if integrated into the educational practice through appropriate pedagogical design, may potentially help educators in their teaching, may increase pupils' motivation for school courses and may yield improved learning outcomes (Attewell, 2005; Haßler et al., 2016; Sung et al., 2016).

It seems that the sense of self-confidence and independence, combined with the opportunities for collaboration and social interaction, that pupils experience while using mobile devices play an important role in pupils' choices regarding the ways in which they prefer to be taught and to learn, given that pupils seem particularly receptive to learning through mobile devices and applications (e.g. Attewell, 2005). In addition, apart from the flexibility that such a mode of learning offers, it may also contribute to the development of pupils' metacognitive and communication skills, such as self-monitoring skills, and may foster their ability to take control of their own learning (Sung et al., 2016; Traxler & Wishart, 2011).

As far as Physical Education (PE) is concerned, promoting pupils' physical activity and exercise is an important aim of school curricula worldwide (e.g. ICHPER•SD & UNESCO, n.d.). At the same time, various studies show that school pupils are generally getting increasingly sedentary and overweight or obese (Mazur et al., 2018; Mumena et al., 2018), and that they tend to make excessive use of mobile devices in a sedentary way, for instance, for gaming, watching movies and other entertainment purposes (Alturki et al., 2020; Derevensky et al., 2019; Qader & Ibraheem, 2019; Twenge et al., 2019). Even athletic youth are prone to such excessive use of mobile devices (Greco et al., 2017). Thus, fostering an alternative culture regarding the use of mobile devices - which pupils already use extensively in their everyday lives- for exercising and for improving one's health constitutes a challenging (for the PE teacher) and potentially enticing (for pupils) approach to the teaching and learning of school PE.

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Utilizing mobile devices in school PE can offer pupils opportunities to become familiar with applications (apps) for supporting physical activity and exercise, and creates the expectation that pupils will learn to make creative use of mobile devices for the maintenance and improvement of their health -and not for harmful sedentary practices, such as spending hours gaming and watching videos- in the present and in a lifelong perspective, which can lead to a better quality of life for them (Cummiskey, 2011; Gresnigt et al., 2014; Papastergiou et al., 2021; Rogers & Price, 2009; Yu et al., 2018).

The foundations for proper mobile device-supported physical exercise should be set at primary school level, given that it is usually at the ages that this educational level encompasses that pupils gain access to mobile devices today (Howard, 2017). Since in many countries the use of mobile phones during class time is prohibited at primary education level (Mobile phone use in schools, 2019), tablets are an alternative mobile device that can be used in PE at that level (Papastergiou et al., 2021).

The research studies that have been conducted thus far on the utilization of tablets in the PE course in primary schools are very limited and have focused on the possible ways in which tablets are used in the course (Mann et al., 2016), on the factors that favor or hinder tablet integration in the course (Bodsworth & Goodyear, 2017), on the impact of tablet use on pupils' motivation for (Papastergiou et al., 2021) and interest in (Zhu & Dragon, 2016) the course, and on pupils' physical activity during the course (Zhu & Dragon, 2016). Only the two latter studies have reported findings derived from measurements of psychological or physiological variables conducted in pupils. Specifically, as regards the psychological variables that had been examined, in the one of the two studies (Zhu & Dragon, 2016), which was conducted in pupils aged 10-12 years, the experimental group, that had used tablets for receiving information and for accessing tools regarding exercise, showed lower interest in the PE course than the control group, that had engaged in a traditional PE course. Conversely, the other study (Papastergiou et al., 2021), which also involved pupils aged 10-12 years, reported that the experimental group, that had used tablets for actually doing exercise, showed higher interest in and enjoyment during the PE course than the control group, that had engaged in an equivalent PE course without tablets.

As deduced from the previous paragraph, the effects of tablet use in school PE on psychological factors related to pupils' physical activity and exercise have been little investigated to date. In particular, the potential impact of tablet use during the PE course on pupils' attitudes and intention towards participation in physical and exercise activities in their free time outside school has not been addressed by any research study thus far, although it clearly needs to be investigated, given that attitudes and intentions towards physical and exercise activities are considered to positively predict one's actual engagement in such activities (Ajzen, 1988).

The study presented in this paper aimed at utilizing tablets as a means for organizing and conducting a circuit training course in primary school PE, and at investigating the impact of that tablet-based training on pupils' attitudes and intention towards participating in sport and physical activities in their free time outside school.

It should be noted that circuit training can be enjoyed by younger and older groups of people and can benefit both physical and mental fitness (Lawrence & Hope, 2011). In particular, circuit training is deemed to be an appropriate method for strength training before adolescence (Patsiaouras, 2015; Weineck, 1987). In circuit training, the pupil passes from a series of consecutive 'stations', in each of which he/she performs a different task (exercise) for a determinate time or number of repetitions, while brief breaks (intervals) for resting and recovery are interjected between stations (Weineck, 1987). It is advisable that six to eight stations, for all major muscle groups (arms, legs, abdomen, back), are used in developmental ages, with a greater emphasis on the muscles of the torso (Patsiaouras, 2015). In primary school children, body weight is sufficient as the main form of load, whereas the intensity and the density (i.e. the number of repetitions) of exercise should be kept to relatively low levels (Weineck, 1987).

Materials & methods

Research Design

The study, which took place in primary schools, involved two independent groups of pupils and repeated measures before and after two PE courses: a) a two-hour Tablet-based Circuit Training course (TCT), in which the one group of pupils (TCT group) participated, and b) an equivalent two-hour Conventional Circuit Training course (CCT), in which the other group (CCT group) participated and which did not involve the use of ICT. Before and after the completion of each course, the pupils of the respective group completed anonymous questionnaires (pretest/posttest), with a view to evaluating the impact of the TCT and the CCT on pupils' attitudes and intentions regarding participation in sport and physical activities.

Sample

The sample were 61 fourth grade pupils, 36 boys and 25 girls, aged 9 to 10 years old. They attended four different primary schools in central Greece. The four schools were randomly assigned to the experimental group (TCT), comprising two of the schools, and the control group (CCT), comprising the other two schools. In each of the schools, one of the 4th grade pupil cohorts of the school was randomly selected to participate in the study, which resulted in a TCT group of 30 pupils and a CCT group of 31 pupils. All four pupil cohorts that

participated in the study were taught their respective circuit training course (TCT or CCT) by the same PE teacher (the second author of this paper). The pupils participated in the respective course (TCT or CCT) by cohort (i.e. as they regularly attended all their school courses).

Tablet-Based and Conventional Circuit Training Courses

In each of the TCT schools, the PE teacher defined 7 different stations for the needs of the TCT, and assigned an Android tablet to each station. The free mobile application 'Interval Timer' (https://play.google.com/store/apps/details?id=cc.dreamspark.intervaltimer&hl) was installed on each tablet by the PE teacher. Using this app, a PE teacher (or coach or personal trainer) can easily schedule the desired workout and break durations in the stations of a circuit (or interval) training. The app provides the pupil (or the user in general) with visual and audio cues (e.g. different coloring of the screen, visible backward counting and various sounds such as brief commands and 'beeps'), which clearly delimit the workout periods and the break periods during a circuit training session. Furthermore, on each of the 7 tablets, the PE teacher stored an animation that visualized the correct execution of the specific exercise that the pupils had to perform in the respective station. In total, 7 different animations (see Appendix) were used, in the form of animated GIF image files, each demonstrating a specific exercise aimed at the development of pupils' strength and flexibility.

The seven exercises were as follows: a) lateral leg lunges (adductors-abductors) (Exercise 1), b) deep squat, backward roll, return to deep squat and upright position (Exercise 2), c) sit up position with knees bent and feet flat, torso and knees remaining at a 90^{o} angle while raising/lowering arms (Exercise 3), d) 'V' sit ups with knees bent (Exercise 4), e) push-ups (Exercise 5), f) prone position, dorsal raises (Exercise 6), and g) straight-arm plank with shoulder touch (Exercise 7). In each of the CCT schools, 7 stations were defined as well, each requiring pupils to perform the same exercise as the respective station of the TCT schools (i.e. Station 1: Exercise 1, Station 2: Exercise 2, etc.), with the difference being that the stations did not comprise tablets (nor any other form of ICT).

In both courses (TCT and CCT), in the beginning of the first hour, pupils did a 7-minute warm-up (consisting of light running, flexibility exercises and stretching) guided by the PE teacher. In continuation, in both the TCT and the CCT, the first hour comprised a brief brainstorming and a discussion on circuit training followed by a training session for pupils' familiarization with the technique of the 7 exercises. Specifically, pupils were asked to verbalize what they thought 'circuit training in stations' meant, to express their ideas regarding the ways in which such training could be applied to pupils, and to describe the characteristics that it should have (according to them).

The pupils expressed their thoughts, recalling various exercises from sport settings and activities in which they had participated. The discussion, which was coordinated by the PE teacher, highlighted the importance of adhering to the duration of the workouts and the duration of the breaks. The effectiveness of circuit training and the benefits that it entails for fitness development were also discussed. Afterwards, the TCT pupils, guided by the PE teacher, tried the tablets and the 'Interval Timer' app (which was already installed on the tablets) while doing the 7 exercises. The pupils of the CCT did the same exercises guided by the PE teacher, without the use of tablets.

In the beginning of the second hour, the same 7-minute warm-up took place in both groups. Afterwards, the pupils of the TCT group formed pairs (or triads in case the number of pupils of a cohort exceeded 14) and each pair (or triad) got a mat and a tablet, with the 'Interval Timer' app already installed and the animated image of the respective exercise already stored. The 7 mats were placed forming a circle of 7 stations in the gym hall. The pupils, guided by the PE teacher, turned on split-screen mode on their tablets so that one half of each tablet screen displayed the animated image corresponding to the exercise to be executed in the respective station, whereas the other half displayed the interface of the 'Circuit Timer' app. The PE teacher had already adjusted the settings of the app so that, in each station, the app provided timing as well as visual and audio cues for a 30 second workout followed by a 45 second break.

The pupils were asked by the PE teacher to themselves verify those settings in order to be informed about the duration of the workouts and the duration of the breaks. In total, the duration of each cycle, namely the time needed for each pair to complete all the 7 stations moving clockwise, was about 9 minutes. As soon as one pair completed their station, the pair moved to the next station (and next tablet) clockwise, as the mats were placed in a circle on the floor (see Figure 1). All pairs began the training simultaneously (pressing the 'Start' button of the 'Interval Timer' app), by executing the exercise that corresponded to the station where the pair initially stood and which was displayed on the screen of the tablet of the station. Each pair repeated the 7-station cycle four times (i.e. the total duration of the training was about 36 min).

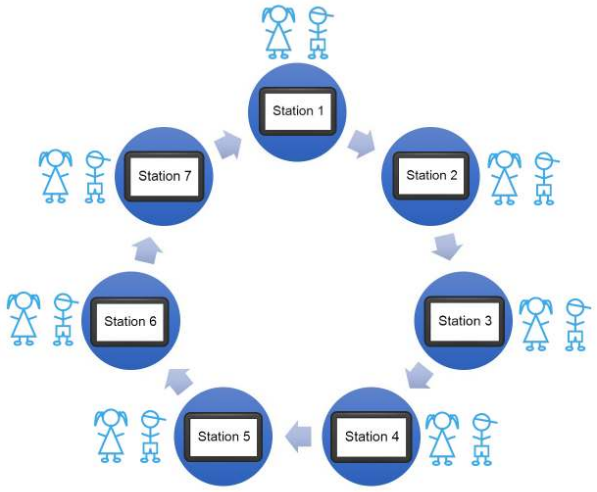

Figure 1. The setting of the tablet-based circuit training course (TCT).

The setting and the procedure for the CCT group was exactly the same with the following difference: the pairs (or triads) of pupils did not use tablets. Instead, before the commencement of the training, the PE teacher showed the 7 exercises to all the pairs and informed them regarding the workout duration (30 sec) and the break duration (45 sec) for each station. During the training, she was responsible: a) for keeping those times, using a conventional chronometer and providing verbal cues to the pupils for each period (i.e. for the changing of stations during the break period and for the commencement of the workout period), and b) for reminding the pairs of pupils how to do the exercises, as it is usually done in every conventional circuit training.

Finally, in both the TCT and the CCT, during the last 3 minutes of the second hour, the pupils did stretches for recovery and relaxation.

Instruments

In order to evaluate pupils' attitudes towards participating in sport and physical activities as well as their intention to participate in such activities, in both groups, in the pretest and the posttest, the 'attitudes' subscale and the 'intention' subscale of a relevant questionnaire based on the theory of planned behavior (Ajzen, n.d.) were used, as they had been extended and adapted in Greek by Theodorakis (1994) and had been used in other studies with Greek primary and secondary school pupils (e.g. Theodorakis et al., 2003). Specifically, as regards assessment of attitudes towards exercise, pupils were given the statement «*My participating in sport and physical activities (especially gymnastic exercises such as squats, abdominals, push-ups) most days of the week in my free time, for me is:*», which they had to rate on four 5-point bipolar adjectives ([1=bad, 5=good], [1=unhealthy, 5=healthy], [1=unpleasant, 5=pleasant], 1=[useless, 5=useful]). As regards assessment of intention towards exercise, pupils were given three statements, such as «*I intend to participate in sport and physical activities (especially gymnastic exercises such as squats, abdominals, push-ups) most days of the week in my free time*», each of which had to be rated on the 5-point bipolar adjective [1=unlikely, 5=likely].

In addition, the PE teacher, who taught both groups of pupils, made informal observations of the pupils' activity, which were also considered in the framework of this study.

Procedure

In each school, before the commencement of the TCT or the CCT, the pupils of both groups completed the pretest questionnaire anonymously, in cohorts, in their regular classrooms. In continuation, for two consecutive school hours, the pupils of the experimental group participated in the TCT and those of the control group in the CCT, which both took place in the gym halls of the schools. After the completion of the TCT and the CCT, the pupils of each group completed the posttest questionnaire anonymously, in cohorts, in their regular classrooms. Pseudonyms that pupils had been asked to note on their pretest and posttest questionnaires (instead of their real names) were used for matching pupils' questionnaires between the pretest and the posttest.

Data Analysis

In both groups, in the pretest and in the posttest, the study measured pupils': a) attitudes towards participating in exercise activities (sports and physical activities) and b) intention to participate in such activities. As regards attitudes, from the pupil's answers to the four questions of the adapted 'attitudes' subscale in the pretest, a pretest attitude score was calculated (the mean of these answers). Likewise, from his/her answers to the three questions of the adapted 'intention' subscale in the pretest, a pretest intention score was calculated (the

mean of these answers). Each of the aforementioned scores ranged from 1 to 5, with a higher score denoting more positive attitudes and stronger intention, respectively. For each pupil, the same calculations were also performed on the basis of his/her answers in the posttest.

The data were analyzed by descriptive statistics (means and standard deviations). Furthermore, potential initial (i.e. pretest) differences between the two groups, were investigated as follows: a) a chi-square test for independence was performed to examine whether the two groups (TCT group and CCT group) differed as to their boy/girl ratios, b) independent-samples t-tests were performed to examine potential differences in pretest scores between the two groups as to attitudes towards exercise and intention to exercise (in these analyses, type of group -TCT or CCT- was the independent variable, whereas attitudes and intention were the dependent variables).

In order to investigate the impact of the two courses on pupils' attitudes towards and intention to exercise, pupils' posttest attitudes scores and posttest intention scores were compared between the two groups through independent samples t-tests. In these analyses, type of group was the independent variable, whereas attitudes and intention were the dependent variables.

All above analyses were conducted using the SPSS statistical package and level of statistical significance was set to .05.

Results

In the TCT group, 16 pupils (53.33% of the TCT group) were boys and 14 (46.67%) were girls. In the CCT group, there were 20 (64.52%) boys and 11 (35.48%) girls. No statistically significant difference as to gender ratios was found between the two groups (χ^2=0.394, df=1, p=0.53).

Table 1 shows attitudes and intention scores for each group in the pretest, together with the results of the independent-samples t-tests that compared these scores between groups. As deduced from Table 1, initially, no significant differences were found in pupils' attitudes towards and intention to exercise between the two groups.

Table 1. Pretest scores and initial comparison of the two groups as to attitudes towards exercise and intention to exercise.

	Tablet-based course group - TCT (N=30)		Conventional course group -CCT (N=31)		Independent-samples t-test	
	M	**SD**	**M**	**SD**	**t(59)**	**p**
Attitudes towards exercise	4.64	0.41	4.71	0.41	-0.65	0.521
Intention to exercise	4.53	0.61	4.45	0.61	0.52	0.604

M = Mean, SD = Standard Deviation

Table 2 shows attitudes and intention scores for each group in the posttest, together with the results of the independent-samples t-tests that compared these scores between groups. As deduced from Table 2, in the posttest, the experimental group scored higher than the control group both in attitudes and in intention, with both differences being statistically significant. Thus, the pupils who had participated in the tablet-based circuit training formed more positive attitudes and stronger intention regarding engaging in exercise activities than their peers, who had participated in the conventional training.

Table 2. Posttest scores and final comparison of the two groups as to attitudes towards exercise and intention to exercise.

	Tablet-based course group - TCT (N=30)		Conventional course group -CCT (N=31)		Independent-samples t-test	
	M	**SD**	**M**	**SD**	**t(59)**	**p**
Attitudes towards exercise	4.86	0.36	4.66	0.39	2.05	0.044
Intention to exercise	4.89	0.29	4.54	0.50	3.33	0.001

M = Mean, SD = Standard Deviation

The PE teacher that taught both courses (TCT and CCT) noticed that during the TCT, the pupils stayed very focused on the training and attentive to the audio cues of the app, and this resulted in greater quietness in the gym hall (as compared to the CCT), to the point that certain fellow-teachers of hers, who had been out of their adjacent classrooms for a while, were really astonished to see pupils being so 'serious' and 'quiet' during a PE course. In addition, from the moment that the timing for the training had started in 'Interval Training' (and

the actual training had begun), she did not have to play a leading role anymore and the pupils were training autonomously in couples (or triads). If a pupil made a mistake (e.g. somehow deviated from the correct time frames or from the specific exercise to be performed), his/her pair, or the pair that followed, urged him/her to correct the mistake and, in this way, the pupil could immediately rejoin the flow of the training program. Surprisingly enough, no pupil attempted to use their tablet in order to search for games or to deviate from the context of the course in other ways. Pupils exhibited high levels of familiarity and readiness with tablet technology and the PE teacher was left with the impression that they would be able to quickly learn to use tablets for any exercise-related task that she might ask them to perform. It was surprising for the PE teacher that even pupils who had not been interested in PE (until the day of the TCT) showed great interest in the tablet-based training. Given that during the TCT the pupils were guided by the audio and visual cues of the app and by the animations of the exercises, the PE teacher had the time to play a more 'quality' role in the course, for the first time in her teaching career. Specifically, instead of being obliged to keep the time with a chronometer and to direct pupils' activity and effort (as she did in the CCT), she had the opportunity to assign that 'mundane' role to the tablet and the app, thus, having the time to make individualized interventions to each pupil, offering them appropriate feedback and helping them correct details of their performance towards improving their technique. These increased opportunities for individualized feedback to the pupils, coupled with the greater autonomy that pupils were feeling during the tablet-based training and their greater focus on actual exercise during that training, may account for the fact that they developed more positive attitudes and stronger intention to participate in exercise activities than their control group peers.

Discussion

In this study, the utilization of tablets to organize and conduct a two-hour circuit training PE course in the primary school resulted in the participating pupils developing more positive attitudes and stronger intention regarding participation in sport and physical activities in their free time than their peers who had participated in an equivalent course without the use of tablets.

The increased opportunities that pupils had to receive individualized help and feedback from the teacher, the fact that they could train autonomously with classmates (instead of getting continuous guidance from the teacher) and the quiet environment, which allowed them to focus on exercise, were elements of the tablet-based course that seem to have contributed to the aforementioned positive results. The positive findings of the present study agree with and reinforce the findings of a prior study in older children which has shown that primary school pupils desire the integration of tablets and mobile applications into the PE course, particularly appreciate this mode of exercising and find it more interesting and enjoyable than conventional exercising (Papastergiou et al., 2021). Furthermore, the findings seem to support the assertion expressed by Yu and colleagues (2018) that use of ICT in PE has the potential to engage pupils in active experiences that help them develop attitudes that lead to lifelong physical activity. In fact, innovative uses of ICT generally hold great promise for physical exercise (Loia & Orciuoli, 2019).

Those who shape educational policy in relation to PE should keep in mind that: a) today's primary school pupils will carry at least one mobile device in the rest of their lives, b) physical activity is the basis for a healthy population (Cavill et al., 2006), and c) pedagogically appropriate experiences of the use of mobile devices and exercise-related applications can enhance primary school pupils' attitudes and intention regarding exercise, as evidenced by the findings of the present study. The fact that, in the present study, exercise supported by mobile devices was found to have a positive impact on pupils is particularly promising, given that promoting healthy physical activity during childhood may prevent future morbidity and may help decelerate the observed age-related decline in youth's physical activity levels (Christodoulos et al., 2006). Of course, PE teachers may not be ready to utilize mobile technologies in their courses, and failed integration efforts, in fact, may be due to PE teachers' lack of experience and appropriate training (Melhuish & Falloon, 2010), which underscores the need for PE teachers' training to fruitfully use these technologies in the PE course. The shift in the PE teacher's role from leader to coordinator of class activity, which occurred in the tablet-based course in this study and which has also been noted in tablet-based PE courses in primary school pupils (Papastergiou et al., 2021) as well as in secondary school students (Gibbone et al., 2014), indicates that such training is worthwhile.

The short duration of the tablet-based intervention presented in this paper is a limitation of the study, which should be addressed in future research. Specifically, as regards future research perspectives, it would be interesting to design, implement and evaluate interventions of greater duration that utilize mobile technologies and bring authentic training practices to school PE, with the ultimate goal of linking exercise at school with exercise at home and more generally, in pupils' everyday life outside school. In this case, it is particularly interesting to study whether and to what extent the use of mobile devices and applications for training inside school yields: similar uses of such devices outside of school, an increase of pupils' physical activity levels and a decrease in the unnecessary, prolonged extracurricular recreational use of mobile devices by pupils.

Conclusion

The use of tablets and mobile applications within a learning context (like the one presented in this study) which provides pupils with basic guidelines, specific tasks and immediate prompts for physical exercise, while referring to authentic training practices, such as circuit training, can contribute in mobilizing pupils in relation to getting physically active and engaging in sport and exercise in their everyday lives. According to the results of the study, the pupils who had participated in tablet-based circuit training exhibited more positive attitudes and stronger intention regarding engaging in exercise activities than their peers, who had participated in conventional circuit training. The study can be useful to physical educators and educational policy-makers, who should consider devising innovative PE curricula and lesson plans that incorporate mobile technologies. The contribution of the study reported in this paper is significant in that it provides guidance for implementing PE courses based on mobile devices and applications, and in that it demonstrates the positive impact of the use of such devices and applications as a way of encouraging children to exercise.

Conflicts of interest

The authors declare that they have no conflict of interest.

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APPENDIX

The seven exercises of the circuit training (as animated images):

Exercise 1: https://gogoodguru.com/wp-content/uploads/2019/03/gogoodguru.com-lateral-lunge-animated.gif (Retrieved May 20, 2019)

Exercise 2: https://i.pinimg.com/originals/0e/04/78/0e047838727b20d588d442bed5745bf9.gif (Retrieved May 20, 2019)

Exercise 3: https://i0.wp.com/static.businessinsider.com/image/5aff4d0d1ae66218008b481b-/core.gif?ssl=1 (Retrieved May 20, 2019)

Exercise 4: https://i.pinimg.com/originals/10/d2/df/10d2dfcdd041e5936d0c3b4fb735c50c.gif (Retrieved May 20, 2019)

Exercise 5: https://www.cdn.spotebi.com/wp-content/uploads/2014/10/knee-push-up-exercise-illustration.gif (Retrieved May 20, 2019)

Exercise 6: https://www.cdn.spotebi.com/wp-content/uploads/2014/10/back-extensions-exercise-illustration.gif (Retrieved May 20, 2019)

Exercise 7: https://art4clip.com/images/drawn-planks-animation-17.gif (Retrieved May 20, 2019)