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Experiences of Prospective Physical Education Teachers on Active Gaming within the Context of School-Based Physical Activity *

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Abstract: The present study aims to explore the experiences of prospective physical education teachers on active gaming. The study, which used qualitative case study design enrolled 2 prospective physical education teachers (1 male, 1 female) who were included in extracurricular activities and physical education classes in 2015-2016 academic year. For data collection, semi-structured interview forms, diaries and extended field notes were used. For data analysis, the content analysis method was used: following the transcription process, coding was performed in two categories and themes and sub-themes were created that reflect common codes. The findings have revealed that according to prospective teachers, active gaming ensures active participation of students and facilitates classroom management in physical education classes, which, in turn contributes to the learning environment where every student can participate. It also has been found that active gaming in the extracurricular activities contributes to the arousal of the initial participation desire in students, and establishment of an environment suitable for the improvement of physical competence. According to prospective teachers, active gaming should be used not in every part, but in certain parts of classes or of extracurricular activities.

Keywords: *Active gaming, extracurricular activities, physical education, prospective physical education teacher, school-based physical activity.*

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Introduction

Today, there are significant obstacles that prevent children from participating in physical activities. It is particularly difficult for children living in metropolitan areas to have access to playgrounds and participate in games outside their homes because of transportation difficulties and because of security concerns of families (Dwyer et al., 2006; Langguth et al., 2015). Apart from these, technology which has rapidly penetrated our daily life has significantly affected the daily activities of people of all ages and sedentary life habits have become widespread rapidly (WHO, 2018). For these reasons, the role of schools, where children spend an important part of their day, in presenting children opportunities to participate in physical activities becomes even more critical. The significant decrease in physical activity levels demonstrates the need for school-based physical activity (SBPA) programs (Sheehan and Katz, 2010). However, the scope and quality of physical education classes and participation in extracurricular physical activities are not at desired levels and vary widely from school to school (Green, 2008). The World Health Organization [WHO] (2010) underlined the mission of schools for physical activity: "All children and youth should be physically active daily as part of play, games, sports, transportation, recreation, physical education, or planned exercise, in the context of family, school, and community activities" (p. 18). Despite such an important mission, a significant number of schools don't place sufficient emphasis on physical education classes or physical activity needs of children and they focus only on academic achievement in some courses (Witherspoon and Manning, 2012). Considering the seriousness of problems that may arise in children due to inactivity, attaching more importance to physical education classes and enriching physical activity options is vital.

The development of children's physical activity habits has been one of the targets of many curricula as well as physical education curricula applied in Turkey (MoNE, 2017). Parallel to these objectives, the aim of the SBPA programs is to provide more motivating activities for children to ensure that they adopt an active lifestyle (Tannehill, Van der Mars, and MacPhail, 2013). The researchers in the field continue to develop new and creative ways to ensure that children

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gain the habit of regular physical activity, which is also the targeted outcome in many physical education curricula (Sun, 2015). Following these research, the use of innovative technologies in physical activity environments has emerged as a new approach to increase children's interest and participation in physical activity (NASPE, 2009). The use of technology in physical education environments has been rapidly spreading in recent years. Technology is especially helpful in classroom management, preparation of the learning environment, and facilitating motivation and communication, which are the main tasks of a teacher (McManama, Hicks, and Urtel, 2014). Apart from this, after the digital games started to occupy a significant part of children's lives, active gaming, developed to fill the gap between physical activity and digital games and enhance physical activity options for children, has also started to be implemented in schools. Such technologies, which can help to attract students to physical activity in SBPA programs, can also diversify students' physical activity experiences. Sheehan and Katz (2010), who examined the contribution of active gaming to improving lifelong physical activity habits, stated that active gaming could be used as part of 21st century physical education curriculum.

This paper aims to explore active gaming experiences of prospective teachers in physical education classes and extracurricular physical activity programs within the context of school-based physical activity. For this purpose, the research has sought to find answers to the following two main questions;

1. How are the experiences of prospective physical education teachers on active gaming in physical education classes?

2. How are the experiences of prospective physical education teachers on active gaming in extracurricular activities?

School-Based Physical Activity (SBPA)

Concerns regarding physical activity levels of children as well as the potential health consequences of poor activity levels are increasing day by day. In this context, it is important to include more physical activities in schools and in physical education curriculum (Cale and Harris, 2006). According to the 2017-2018 academic year data of the Turkish Ministry of National Education [MoNE], the number of students attending schools is 17.885.248 (2018). This figure demonstrates the unparalleled value of schools and the importance of the work to ensure that children participate in physical activity. In addition to their ability to create environments where many children can come together, schools also provide children with unique times such as pre-school time, recess, lunch breaks, physical education classes and extracurricular activities. SBPA programs should be emphasized in order to give children the habit of physical activity and to increase their physical activity levels. Besides physical education, SBPA can be implemented in schools in Turkey 6 hours a week by physical education teachers in 19 branches, by teachers with "Scout Leadership Certificate" and by folk dances teachers provided that the minimum number of students attends the extracurricular activity (MoNE, 2010). In addition to this, with the directive issued in 2014, training courses can be opened within the scope of supporting formal and non-formal education and training courses during three academic periods provided that at least ten students enroll. The scope and quality of different programs, how they can differentiate from traditional team sports, the competencies of teachers in developing different branches, the coverage of all students, and the extent to which these programs can be supervised are some of the questions that need answers. Positive results in improving physical activity and improving children's skills that are achieved in the research on school-based physical activity interventions indicate the importance of studies to develop and diversify these programs (Dobbins, DeCorby, Robeson, Husson, and Tirilis, 2009; Goreley, Nevill, Morris, Stensel, and Nevill, 2009; Gao, Chen, Huang, Stodden, and Xiang, 2017; Rasberry et al., 2011). In this context, Sun (2015) stated that active gaming could help create physical activity habits in children regarding motivation, learning and physical activity level. Despite the high number of studies on the impact of school-based physical activity studies, studies to guide physical education teachers regarding the practices to be applied in these programs are not sufficient (Cale and Harris, 2006). In this context, this study aims to explore the experiences of prospective physical education teachers on physical education classes and extracurricular activities, which are the two most powerful tools of school-based physical activity and reveal findings that can be used by people and institutions involved in education.

Methodology

To further explore the experience of prospective physical education teachers in active gaming-supported physical education classes and extracurricular activities, this study employed qualitative research approach and case study design. In the case study, a researcher conducts a thorough investigation of a program, event, activity, process, or one or more persons (Creswell and Creswell, 2017). In this study, active gaming in extracurricular activities and active gaming in physical education classes were accepted as separate cases and were examined separately. This type of research aims to provide an in-depth insight into a research topic and a follow-up of the process (Vogt, Gardner, Haeffele, and Vogt, 2014).

The Context of Research and Practice Process

This research was conducted in T.E.K Secondary School, a public school located in the Golbasi district of Ankara, during the 2015-2016 academic year. The school has a gym where physical education classes are held. A "SmartWall" system was established in the gym for use in physical education and extracurricular activities throughout the research (Figure 1.). Offering interactive physical activity, this system was installed in the school's gym to serve three different groups.

Swimming noodles, various types of balls, small beanbags, bosu balls, cones, training ladders, hoops and slaloms were also used with technological support. The researcher both actively observed and participated in physical activities. An active participant undertakes different tasks in the environment in which the action takes place (Savin-Baden and Major, 2013). The researcher was one of the three teachers involved in the process. He also completed his doctorate thesis in this field and worked as a physical education teacher for 6 years in the past. Through active participation of the researcher, it was aimed to prevent any external influence on the natural behavior of the students.

Figure 1. T.E.K Gym Smart Trainer System

The research continued in the first and second terms of the 2015-2016 academic year. The process that started with the preparation of plans, installation of the system in the school and training of prospective teachers in September and October continued with extracurricular activities for three days a week for ten weeks between 2 November and 22 January. There were 24 students involved in extracurricular activities other than participants. With the end of the first semester, physical education lesson plans were prepared for the second semester in February and active gaming-supported physical education classes were carried out with the 5th grade students for 12 weeks between March and June. There were 30 students involved in physical education classes other than participants.

Participants

Two prospective physical education teachers (one female, one male) who were enrolled in the Department of Physical Education and Sports Teaching at Ankara University Faculty of Sport Sciences in the 2015-2016 academic year participated voluntarily in the study. The criterion sampling method, which is one of the purposeful sampling methods, was preferred in the selection of participant prospective teachers and the practice experience was accepted as a criterion. The two prospective physical education teachers previously had the opportunity to implement active gaming within the scope of different courses and had preliminary knowledge about the active gaming program and participated in the pre-practice of the process. The reasons for the selection of two prospective teachers can be summarized as: Due to the difficulty of the preparation process the researcher need to be in constant contact with the practitioners throughout this process. They also have a long experience of about 18 months along with the learning process. Apart from these, it is very difficult to find a teacher who can participate in both physical education classes and extracurricular activities as a practitioner and to involve in study for a long time. The participants were informed about the purpose of this research at the beginning of the process. Participants took part in approximately 30 extracurricular physical activities and 12 physical education classes as instructors during an academic year.

Data sources

As it is important to provide an in-depth understanding in qualitative case studies, comprehensive data sources are often included (Creswell and Creswell, 2017). In this context, semi-structured individual interviews, diaries and extended field notes were used for data collection. The interviews with the prospective teachers were carried out 4 times in the 5th week and at the end of the two practice periods. The interviews lasted for 25-45 minutes. Interviews were conducted by the researcher. During these interviews, where a voice recorder was used, the role of the researcher was facilitator. Changes in opinions were also explored through more than one interviews. The prompts specified by the researcher determined the frameworks of the interviews. In addition to the semi-structured interviews, which are the primary source, reflective diaries were also used for data collection. Prospective teachers were asked to write their observations and thoughts about the practice of that day in their diaries. Prospective teachers wrote their notes in their diaries on the same day regarding student behaviors before the course, individual and group behaviors of students

during the course, important anecdotes about that day, physical development characteristics observed in children and children's speeches or gestures that reflect their feelings of fun, boredom and excitement. In this way, all the details about what happened during the practice were tried to be described. In addition to these tools, extended field notes were also used to support the collected data. Field notes are the open-ended and first-hand information gathering process by observing places and people in the research area (Cresswell, 2012). Extended field notes were taken after the practices through the videos of all the practices. For the practice and data collection process of the study, an approval form was received from Ankara University Ethics Committee. Moreover, because the research was conducted in a school affiliated with the Ministry of National Education, permission was obtained from the Ministry of National Education. Video recordings were not shared with anyone during the process and the data obtained from the interviews were shared using pseudonyms as per the privacy principle.

Data analysis

Content analysis method was used to analyze the qualitative data. Content analysis is a careful, detailed and systematic examination and interpretation of a specific material to define patterns, themes, assumptions and meanings (Berg, Lune, and Lune, 2014). Since the study was conducted in two different contexts, the analysis process was carried out both for physical activities and physical education classes. Once all the data collected through interviews, field notes and diaries were transferred to the computer, labeling was performed to capture the meaning of each data by explicit coding and the theme - sub themes that reveal the common ideas were found and named. Data analysis was carried out by the researcher. To ensure the quality of the research, many researchers have developed different concepts that they think are appropriate (Guba and Lincoln, 1994; Major and Savin-Baden, 2010). To ensure the credibility of this research, strategies such as data diversity, long-term stay in the study field and detailed writing of the whole process were adopted in terms of process. Transcripts was sent to the participants and their approval was received. Moreover, in terms of the product, strategies such as specifying the role of the researcher, describing the characteristics of the context studied, and including direct quotations were adopted (Savin-Baden and Major, 2013).

Results

The present study aimed to explore the experiences of prospective teachers about active gaming practices under SBPA during the 2015-2016 academic year and their opinions regarding active gaming in physical education classes and in extracurricular physical activity program. Similar and different themes were reached in both categories. In this respect, the findings on active gaming in the physical education classes were presented under the themes of "active participation" and "contributions of active gaming to the learning environment" while the findings on active gaming in extracurricular physical activities were presented under the theme of "an enjoyable environment that arouses a participation desire" and "the environment suitable for the development of physical competence".

Active gaming in physical education classes

Active participation

There is a direct relationship between students' participation in physical activity and motivation. According to prospective teachers, 5th grade students participated actively in physical education classes structured with active gaming.

> **Researcher:** What do you think about active gaming in physical education classes?
>
> **Mine:** First of all, every child participated this class. I think this is the most important part for me. Girls do not stay in the locker room or it is not only certain students who participate as in other physical education classes. What ensure this is both the motivating characteristics of the system and the sensitivity of teachers.
>
> **Researcher:** What do you think the students were thinking about this technology?
>
> **Ender**: I think they wanted this technology to be used. I asked a few of my students, "if we didn't have this technology, would you still participate in the class?" They said, "Without technology, we wouldn't enjoy the class at all." This technology has directly affected their participation in the class.

Motivational elements enabling active participation of students according to prospective teachers have been interpreted under the sub themes of fun and curiosity.

Fun: According to prospective physical education teachers, through active gaming-supported physical education classes have more fun, and thus, were more willing to participate actively. About the fun aspect of the program, Mine said: "*Fun, so much fun. Even if you are 20 or 30, seeing that feedback, the scores, flashes on the scoreboards would make everyone happy, I believe."* Ender, comparing active gaming-supported physical education classes with traditional physical education class, found that they were more fun:

> I compare it with a traditional physical education class. For example, I attend special teaching methods classes. We use locomotor movements there sometimes, but there is a big difference. In the other class, it looks as if the students are doing it just for the sake of doing it. I can't observe they're having fun, but they're having a lot of fun in this class and they're willing to participate.

The opinions of the prospective teacher about the results that can be obtained without active gaming is reflected in the interviews as follows:

> **Researcher:** If you consider your experience as an instructor, do you think there might be similar results if there were not technology?
>
> **Ender:** In some activities, we could achieve some results without the technology. Activities could be made funny in a way; but I think that the fun and motivation provided by technology in most of the activities cannot be ignored.

Curiosity: Another factor that ensures active participation according to the prospective teachers is that the curiosity that system arouses in students. Physical activities with the audiovisual stimuli provided by technology support aroused interest in the children. In this way, and with the supportive attitude of the teachers, students who did not normally participate due to skill differences or weight related issues also participated in the activities. About the relationship between the curiosity that the system aroused and children's participation in the physical education classes with active gaming, Mine said:

> Something very remarkable; colors, sounds or different materials all have an effect. They certainly made a difference. I think that there wouldn't be so much participation in fundamental movement skills. I think the interested children would still participate, but less skilled children with less skill levels would prefer waiting aside.

Also, the problem of exclusion of less skilled or overweight children, frequently seen in physical education classes, could be overcome with the interesting and appealing structure of the program, as can be understood from the following statements of Mine and Ender:

> **Researcher:** What did you observe about the participation of less-skilled or overweight children?
>
> **Mine:** Slightly overweight children would ask "Maybe we should not participate in some of the activities". But when they participated and were successful in the activities, they said "We can do it, teacher". They realized that they were able to do it in the second or third repetitions, although not in the first one.
>
> **Ender**: It would have been more difficult to ensure these students' participation if it wasn't for the active gaming. Normally, when playing games at school, other students want to exclude less-skilled or overweight students so that they could win the game. But, in our process, activities appealing to everyone were held and everyone participated. Other students saw that they could win games with less skilled or overweight students. The overweight students also realized that they were able to do it.

The other feature that enabled the active participation of children in the active gaming-supported physical education classes was the diversity that the students were not accustomed to in traditional physical education classes. The diversity of the activities in the system as well as the materials used in the activities helped ensure the active participation of the students. According to Ender, diversity of activities attracted the attention of children: *"In traditional physical education classes, these students always do the same activities. Students have more fun when they see different activities and when there is competition in these activities. The diversity of the activities certainly attracted their interest".* About the role of diversity in the physical education classes, Mine said: "*We played different games and used different materials. Students did not play with the same ball every week. They saw noodles, balance balls, different balls, rackets etc. They saw diversity of activities, and this attracted their attention."*

Contributions of active gaming to the learning environment

According to prospective teachers, the learning environment formed by active gaming-supported physical education classes also had pedagogical reflections. Active gaming made significant contributions to facilitating instructional and administrative tasks, especially during the class. Supportive role of the active gaming program can be categorized under the sub-themes of classroom management, instant feedback and physical education for all.

Classroom management: The nature of physical education classes brings about management and organization challenges compared to other branches. At this point, the fact that active gaming-supported activities attracted the attention of students and enabled them to concentrate contributed to the classroom-management, according to the prospective teachers. About the facilitating aspect of the program, Mine said: "*The focus of the students is at a certain point and this makes classroom management easier …"* Similarly, about what happens in the learning environment after the focus of the students is gathered in an activity, Ender said the following:

> Active gaming enabled us to attract the focus of the class at a point. In this way, the number of students losing interest in the lesson decreased. Different students went in and out of the hall, but no one looked at them; they were not distracted. In this process, they were constantly engaged in the activity and the time devoted to the activity increased. External interventions normally affect the lesson, but there is no distraction in technology-supported classes. Without technology, the time spent on activities would be shorter.

It can be inferred from both the interviews and field notes that, since the 5th graders are in the transition phase after primary school, instructors have difficulty in class management. It can be understood from the following dialogue that the group of students that participated in the active gaming-supported physical education classes was a difficult-to-handle group.

> **Researcher:** What do you think about the children involved in the program?
>
> **Mine:** The most troubled group we could encounter would probably be such a group. There are always a few naughty children in classrooms, this is normal. Children's mischief continued increasingly with the effect of the season. Seeing that we have been able to apply this system with such a difficult group, we can apply it to almost any group.

According to the prospective teachers, despite difficulties in the classroom management, active gaming-supported activities motivated the students, who are normally accustomed to doing nothing in the classes, into participating in the activities, accelerated their adaptation process and system-based planning facilitated the classroom management:

> **Researcher:** What do you think about active gaming-supported physical education classes?
>
> **Ender:** Most students want to play different games constantly. Some want to play football, some volleyball. Because there's a culture in the school. Students want to do what they want to do in the physical education class, not what the teachers tell them to do. Active gaming made it easier for us to overcome this. It broke the students' resistance.
>
> **Researcher:** What are the contributions of technology support?
>
> **Ender:** The system enables us to do this: We have three devices and we must divide the class into 3 or 6. In the end, we will use these three devices. These three devices make it easy to organize the classroom.

Instant feedback: Another contribution of active gaming to the learning environment was the instant feedback. In the evaluation section, children received instant scores on the correct shots or touches with system support or they received an audible signal when they did not reach the target. According to the prospective teachers, the system motivated the students through audio or score feedback to correct shots. About the importance of getting feedback for students, Mine said: "*It was very important for them to receive instant feedback from the system."* Evaluating this from another perspective, Ender linked the feedback to the competitive environment and said the following about the impact of the scores on the students: "*As we divided them into three groups, children feel in a way that they are competing. They feel so happy when they receive audio feedback as scores from that device. This motivates them.*"

Physical education for all: A physical education class where active gaming is used is fun and interesting with different activities. Therefore, such physical education classes enable everyone to participate, including students who are left aside because of their ability, gender and weight differences. These findings are presented under the theme of active participation. Thanks to this feature, the learning environment gained a structure that supported the participation of all students. About the effects of rapidly increasing obesity levels on the classroom environment and the status of children with weight problems, prospective teacher Mine said:

> When we were students we would have one or two students with weight problems in our classes. Today there are more overweight children and these children do not usually participate in physical education classes. They are somehow excluded from the groups. They want to play football, but other students do not want them in their teams because they think they will slow them down. In our study there is no such possibility. Overweight students also participate in active gaming actively. The child learns that he/she can do it... Aside from its participation-enabling feature, physical education classes with active gaming also creates an opportunity for students to learn. Maybe they would never participate under different conditions, or maybe they would never find an opportunity.

Apart from the provision of appropriate conditions for the participation of children excluded due to weight problems, the process of learning a variety of skills that could normally be boring became fun together with technology support as, the students were more willing to participate and had the opportunity to repeat movements. P.T. Ender expressed his observations on this subject as follows:

> For example, we are working on the locomotor movements. These are fundamental activities such as walking, running. These activities are normally at kindergarten level, but we wanted the fifth graders to do them because they had not received this basic training before. Without technology, these activities

> would be too boring for the students. In this process, they learned all of the locomotor movements, learned many of the manipulative skills, they had the opportunity to repeat the movements.

Physical education classes with active gaming enabled an environment where everyone could participate and improve their skills. In addition, regarding whether the learning environment should be designed with a system-oriented approach, the prospective teachers thought that it would be more effective to use technology in certain parts of classes, not in all of the classes: *"It would be more appropriate to use it in certain parts of the classes".*

Active gaming in extracurricular physical activities

Active gaming program has been implemented in extracurricular physical activities in the school system that provide important opportunities within the scope of SBPA, and the relevant observations of prospective teachers are presented under the themes of an enjoyable environment that arouses a participation desire and environment suitable for the development of physical competence. While the practices within the physical education classes focus entirely on the learning outcomes included in the curriculum, extracurricular physical activities have been prepared with the aim of developing various abilities in students from different grades. In this sense, different findings and themes originated from the difference of context with similar findings.

An enjoyable environment that arouses a participation desire

Extracurricular physical activities are carried out on a voluntary basis unlike physical education classes. In this respect, it is necessary to prepare appropriate conditions for the arousal of participation desire in the child and the continuation of this desire. According to the prospective teachers, the enjoyable environment aroused a participation desire in the children. Findings on this theme are presented under the subthemes of initial desire and fun, ongoing interest and integrity.

Initial desire and fun: According to the prospective teachers, active gaming support played an important role especially in creating initial desire in children. About this process, P.T. Mine said:

> There were different sources of motivation. Initially the system was a very important factor; it was something they had never seen before. It is very important for both computer addicts and those who never used it. Then there were different sources of motivation. Because the number of students was never less than 18-19.

Also, participation in the program that started at the end of the school also meant a preference and according to the prospective teacher Mine, technology support had an important role especially in male students' preference of this program despite their computer games at home. In this respect, Mine said:

> I think boys play more computer games than girls; they are more interested in games. Some children attended the program despite their fear that their siblings would use their computers at home. They attended the program even on days when they were absent from the school. Yagiz said that he secretly took the tablet and played games until the morning. He said, 'I was very tired, but I came to the school just because there is this activity'.

Extracurricular program with active gaming contributed to the creation of an enjoyable environment together with the initial desire to participate. Ender, on the other hand, said that a more enjoyable environment was obtained with the help of technology: *"If we applied this program without technology students would still have fun, but it is a great advantage to have technology. I think they like the technology-support."*

Ongoing interest: The technology support, which is especially important in arousing the initial desire for participation, has also contributed to the ongoing interest. One of the events showing the interest of the students is that, Eray, who crashed into his friend and fractured his wrist during the activity, came the other day and said that he still wished to participate in the activities although his wrist was in a plastic cast. This situation was reflected in Ender's diary with the following statements:

> The student who fractured his wrist in the last activity said that he would like to participate in activities with a cast on his arm today. Despite all our warnings, he still wanted to participate. So, we made some adaptations for him to participate. This event shows us how enthusiastic this student is. We can see how motivated the student is (09.11.2015).

Similarly, one of the important events that show the children's willingness to attend the program in the following weeks is that, when we told the group that there would not be a practice due to New Year's Eve, the group said they would like to come even though there is no school. This situation is reflected in P.T. Ender's diary as follows:

> At the end of the activity, we said that Friday was the New Year's Eve, so we would not practice because there would be no school. The students objected to this. Most of the students said that they would like to come. This shows that the students are interested in active gaming and that they would come to school

> only for active gaming even though there is no school. We told them that we would not practice on Friday, but we would practice on Thursday. Most of the students came on that day (31.12.2015).

Integrity: It can be understood from the statements of the prospective teachers that in the arousal of participation desire in students and in ensuring the continuation of this desire, different elements should be taken into consideration as a whole outside of technology. The activity and material diversity supporting the program process, the reward system supporting the competitive environment and the interventions of the instructors have an important share in the continuation of the interest throughout the process. P.T. Mine said the following on this issue:

> Our materials were very strong; I believe that besides the system, our materials attracted the attention of children. If we had always used the same materials, the children could have lost their interest; but the branch changed, and thus the materials changed. Maybe the child was going to leave the program, but, we started for example basketball and this attracted the child's attention. Girls, for example, asked when the football would end; at that time the material changed, the branch changed. Smartwall (technology support) is something that attracted interest, but the materials and diversity we used are also important.

According to P.T. Ender, at the beginning of the process, especially the system excited the children, but over time the competitive environment and reward system motivated them: "*At the beginning, technology excited them; over time, competition, rewards and friendship started to excite them.*"

Environment suitable for the development of physical competence

Findings on this theme are presented under the sub-themes of "the role of extracurricular activity program" in providing different activity environments for the physical development of children and "the observed physical competences" among general developmental characteristics observed by prospective teachers in the students participating in physical activities.

The role of extracurricular activity program: Children were not taken to completely different physical activity environments within the scope of the active gaming program. However, an environment of diversity was tried to be provided with an activity pool that required the development of different skills within the same environment. Fundamental movement skills and skills of different branches were presented in different activities. In addition, parkours were developed for the development of different motoric skills and diversity was aimed within the same environment. According to P.T. Mine, this diversity is the strength of the program: *"Diversity is the strength of the program. Although it looks like a uniform, active gaming program provides diversity*." With this diversity, children with more time to spare to extracurricular activity have had the opportunity to develop both basic movement skills and experience different types of activities. About this opportunity offered by the extracurricular program, P.T. Ender said the following:

> Students may not do so much repetition to learn different skills in a traditional physical education class. Because of crowded classes and lesson plans that do not take into account the skills, the children can only play games like volleyball, basketball or dodgeball. But extracurricular activity programs provide students with the opportunity to develop basic skills that they should have previously developed (Prospective teacher diary, 16.11.2015).

In this respect, one of the most important opportunities of extracurricular activities within the scope of school-based physical activity is that the children are provided with the opportunity to do sufficient repetition which they cannot find in the physical education classes with limited time.

In addition, according to the prospective teachers, such technologies should be available in schools and used in certain parts of the physical activity programs, even if not all the time, for participation and diversity. Regarding the necessity for these technologies to be available in schools, P. T. Ender said:

> I think this is definitely something that should be available in all schools. This is what I have been thinking since we first started. Technology is one of the things through which we can attract children's attention. Technology will attract the attention of even the youngest or oldest person. I think it should be available in all the schools because it is something modern.

Regarding active gaming in classes or extracurricular activities, P.T. Mine said*:*

> Yes, it can be used but up to a certain point. It can be used at the beginning. It can be used as a motivation tool while giving the basic skills of branches. It can be used in different parts of the class, in the warm-up part or in the individual play part. In this way, we can draw the attention of children who are not interested and can ensure that they participate in the class. This is our biggest goal. Diversity can be used to support the participation.

She stated that technology support should be used not in all but in certain parts of the practices. In summary, prospective teachers stated that technology supported systems should be available in schools and should be used in practices.

The observed physical competencies: The developments observed by the prospective teachers in the students who participated in the program were related to the movement skills or various parameters of fitness. According to the prospective teachers, after the female students who considered themselves to be incompetent entered the activity environment, they developed self-confidence that they can do the movements. P. T. Ender said the following with regards to this:

> There were girls who considered themselves to be incompetent in terms of psychomotor skills. They could not even hold the ball, or they were afraid of the ball. They panicked. When they held the ball, they looked at us, as if asking 'what will I do?' As weeks passed, they began to develop more self-confidence. They said, 'I can do this'. At this point, I think that girls made a great progress.

Regarding the development of self-confidence in girls, P. T. Mine said: *"I definitely think that girls have developed self-confidence. For example, Eda, Sude, Inci looked at me after every movement and asked, 'Could I do it?'".* The observations of the prospective teachers reveal that active gaming-supported extracurricular activities program contributed to the girls' development of self-confidence. Repetition opportunity and the fact that they could see that they could do was especially supportive in terms of self-confidence. Moreover, prospective teachers observed improvements in students in terms of mobility skills or basic motoric skills. At this point, according to P.T. Ender, the most important reason for the development is the repetition opportunity in the program. He expresses the importance of this issue with the following words: *"Technology support in this program has had an impact on these children, I think. Because they had the repetition opportunity. Maybe they would never have had this opportunity in the physical education class."* Similarly, Ender's statements on the same subject point to the importance of repetition opportunity and feedback.

> Today we have worked on dribble and passing basketball. At first, many of the students had difficulty in performing the activity; they bounced too high, the fingers did not follow the hand when bouncing the ball, they did not look straight. As the activity continued, they corrected their mistakes according to the feedback we gave. This actually confirms the need for a lot of repetition in order to transform the movement into a skill in the student (Prospective teacher diary, 09.12.2015).

Thanks to the features of the physical activity setting, development has been observed in many different parameters. One of the developments observed in the group was aerobic endurance. The development of this was reflected in the warming process in which the prospective teachers also took part. On this issue, P.T. Mine said: "*Their condition increased. Children who would be out of breath after the second round started to run very comfortably. In the last warm-up, I couldn't keep up with them. Their tempo was so high. I see a clear physical development."* P.T. Ender, on the other hand, said: *"Our warm-up section has now become routine. Everyone can complete it without difficulty. They would all gulp for air previously, but now they can complete the warm-up easily."* (11.12.2015)

Apart from aerobic endurance, other developmental characteristics observed by the prospective teachers in the program were related to their movement skills. P.T. Ender expressed the general development in this process as follows: "*We had a very fast program with the students. We taught changing locomotor movements and object control movements quite fast. Although it was a fast process, I have seen a great development in students."* P.T. Mine emphasized the development in the girls: *"I see incredible development in girls' skill levels. The girls were very different. They would pass the volleyball as if they were passing basketball. This situation has quite changed.*" P.T. Ender emphasized the importance of feedback and repetition opportunity in the learning process of a skill from another perspective. He shares his thoughts about the differences observed in the students in terms of a basketball skill with the following words: *"The students who had difficulties in bouncing the ball at first were able to dribble and do a chest pass in combination at the end of the activity."* (09.12.2015)

Discussion, Conclusion and Recommendations

In the present study using active gaming in physical education classes and extracurricular activities, which are two important tools of school-based physical activity, the opinions of the prospective teachers were evaluated in two categories. In the current educational structure of Turkey, two common elements of school-based physical activity are physical education classes and extracurricular activities programs. In this context, the study included activities based on active gaming in physical education classes and extracurricular activities. Prospective teachers have expressed positive opinions on the power of practices to provide opportunities for the development of children's physical competences especially through active participation. In their study covering a period of 21 years, Telama et al. (2005) revealed that those who are engaged in high levels of physical activity during the ages of "9-18" continue to be engaged in physical activities during adulthood. This is an important finding in terms of showing the importance of school years in helping children acquire physical activity habit. Various studies on school-based physical activities have also found that such programs have an important contribution to physical fitness (Dobbins et al., 2009; Gorely et al., 2009; Harris, Kuramoto, Schulzer, and Retallack, 2009; Kriemler et al., 2010). School-based physical activity programs are important in terms of participation in life-long physical activity. In this study, active participation of children in the physical education classes and extracurricular activity program using active gaming shows that efficient results can be obtained.

Prospective teachers stated that active gaming in physical education classes provided active participation, attracted the attention of children and helped them have fun. Studies indicate that there is a positive relationship between the fun children have from an activity and their participation in that activity (Carroll and Loumidis, 2001; Lyu and Gill, 2011). In their study on the perceptions of prospective teachers about the use of active digital games in physical education, Jenny, Hushman and Hushman (2013) indicated that such games were fun and enjoyable. The results indicate that the activities in physical education classes should be fun, interesting and diversified in order to ensure active participation of children and that active gaming is a facilitator in this regard.

In addition, according to the prospective teachers, active gaming contributed to physical education classes in that it facilitated classroom management, provided instant feedback, and it enabled the physical education teacher to design the class according to different skill levels. In his review study on the benefits and outcomes of physical education in schools, Bailey (2006) stated that physical education classes can provide important contributions in five areas and that these contributions can only be achieved by fun physical education classes which cover adequate time, involve everyone, and have a diverse and supportive environment. In fact, in our study we determined that factors such as fun, teacher's support and participation-supporting were emphasized by prospective teachers about active gaming in physical education classes. This finding is consistent with the features that physical education classes should have. This also emphasizes that active gaming in classes can only be meaningful with the correct practices and effective characteristics of the teacher preparing the learning environment. A number of studies have shown that active gaming-supported practices provide feedback, are remarkable, and can be adjusted to different skill levels (Huang and Gao, 2013; Sun, 2015; Thin, Hansen, and McEachen, 2011). In this respect, the fact that similar factors were emphasized in this study underlines the consistency with the other studies conducted to date. Another important result that needs to be stressed in the context of the contributions of active gaming to the learning environment is that the prospective physical education teachers stated that active gaming would be more effective if it is used, not during the entire class, but in certain parts of the class. The prospective teachers and the researcher who noted his observations in the field notes both believe that technology support should not be used alone, rather, it should be a part of the whole, and different physical activities and games should also be included in the lessons. The choice of technology support to be used is also very decisive at this point. Some active gaming options are entirely based on screen-based games, while others play a role in a natural physical activity environment. While some studies highlight the transformation of technology in the physical activity environment, some other studies indicate that technology support cannot replace physical activity in the real environment (Nadler, 2008; Vander Schee and Boyles, 2010).

As regards active gaming in extracurricular activities, the prospective teachers stated that active gaming plays an important role in arousing an initial participation desire in children, that it contributes to the continuation of this desire, and that it offers an integrity with not only the technology used, but also with the materials and teacher's support. Sport-based activity program and active gaming-based program were compared in terms of arousing a participation desire, and it was concluded that active gaming-based activities attracted students who were reluctant to participate in sports-based programs (Epstein, Beecher, Graf, and Roemmich, 2007). Furthermore, studies by Sun (2013) also show that technology support helps to arouse the initial participation desire and ensures the continuation of this desire. The results of our study are consistent with those of the studies on the arousal of the initial participation desire and the provision of the continuation of the initial desire. Beyond the technology used, the variety of games and materials in the program came to the fore as a powerful factor in ensuring the integrity of the program. Studies on this topic indicate that various physical activities and games for school-age children also diversify targets and enable children to become more active (Lindqvist, Castelli, Hallberg, and Rutberg, 2018; Prichard, 2012; Schoenau-Fog, 2011).

Regarding the functions undertaken by extracurricular activities programs, the repetition opportunity that they offer and their structures suitable for learning differences have come to the fore. Castelli, Barcelona and Brytant (2015) listed some of the properties that schools should have in order to educate children who make physical activity a part of their lives: (a) a holistic approach; (b) effective and diversified pedagogy. In this regard, the results regarding the extracurricular activity show that active gaming has properties that can support this structure. In addition to this, prospective teachers stated that they observed development in the children in terms of physical competence and aerobic capacity and movement skills along with the extracurricular programs. With respect to improving aerobic capacity, a number of studies have revealed that active gaming helps the individual achieve target heart rate and moderate-intensity exercise levels (Huang, Wong, Lu, Huang, and Teng, 2017; Sween et al., 2014; Unnithan, Houser, and Fernhall, 2006). These studies are important in terms of the development of aerobic capacity observed in children. In addition, improvements in mobility skills in children suggest that extracurricular activities in the context of school-based physical activity can help improve children's physical skills (Cicovic, Stojanovic, Ruzic, and Tanaskovic, 2015).

The results from the present study indicate that extracurricular physical activities and physical education classes are important parts of school-based physical activity and it is an area where important research can be carried out along with qualified programs. In this context, we recommend that, with its capacity to arouse participation desire in children and to ensure their active participation, active gaming should be used as a supporting factor and that studies should be conducted in this regard in the future. The present study included prospective teachers as instructors. We recommend that such research should also be carried out with physical education teachers working at schools after they are

provided with necessary training and that their opinions on the role of active gaming in the physical activity environments should be investigated.

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