Obstacles Perceived by Physical Education Teachers to Integrating ICT

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ABSTRACT
Teachers find difficulties and barriers about integrating technology in the physical education classroom. Therefore, the aim of this study is to analyse the perception of PE teachers regarding obstacles to integrating ICT and its relation with their age. The methodology followed was quantitative and descriptive in nature. The participants were 400 secondary education PE teachers. A face-to-face standardised interview was used through "EFYTICS" questionnaire. Results of the study showed that the most frequently perceived obstacles were: loss of time spent on physical activity, lack of resources, investment in time and training, unsuitable use, lack of knowledge, and technical problems. By age, these same obstacles were perceived, but in a different order. Improvement actions should be established so as to better integrate ICT, mainly to deal with those obstacles that are more greatly perceived by teachers, in order to use ICT in an educational way in the classroom and to take advantage of all of the benefits they offer to the subject.

Keywords: ICT, physical education teachers, secondary school, perception, obstacles.

INTRODUCTION
Despite all of the benefits of integrating information and communication technologies (ICT) into education (Karsenti & Lira, 2011), their application to the subject of physical education (PE) continues to pose a great challenge for teachers due to the unique nature of the class: the importance of the motor component, limitations on space, time, training, etc. (Villalba & González, 2016). In spite of this, teachers integrate ICT in their PE classes, for example through the use of computers, e-mail and Internet (Gibbone et al, 2010), pedometers, heart rate monitors, telephones, tablets, reality simulators, exergames (Zhu & Dragon, 2016) and mobile applications related to physical activity and sport (Pyle and Esslinger, 2014). However, some authors have expressed the difficulties and barriers teachers face when integrating technology to PE, as well as some approaches that can be taken to overcome them (Pyle & Esslinger, 2014; Shan Fu, 2013). The use of technology in PE is being accepted at a generally slow pace (Gibbone, Rukavina & Silverman, 2010).

Furthermore, a study done by Karsenti and Lira (2011) found that ICT are rarely used in an educational context in various countries (Bauer and Kenton, 2005; Wallace, 2004), and therefore it becomes necessary to continue researching ICT in PE as a unique context due to its specific characteristics (Gibbone et al., 2010).

Throughout the study, reference will be made to the obstacles perceived by dividing them into aspects related to the teachers and those related to the students.

Obstacles perceived to incorporating ICT related to aspects involving the teacher
According to aspects related to the teachers, lack of time is an important obstacle to truly integrating the use of ICT into the PE programme. It takes time to configure said technology, to learn to use it, and to plan and understand how to integrate it into one's own practice during the teaching-learning process in an appropriate, educational manner (Almekhlafi & Almeqdadi, 2010; Legrain, Grillet, Gernigon & Lafreniere, 2015).

Another significant obstacle is the time it takes to train teachers. Cuckle and Clarke (2002) and Yildirim (2007) found that a lack of ICT education in schools that train teachers was a barrier to the use of ICT in the classroom.

Along these lines, Thomas and Stratton (2006) found that there was a clear need for training in order to develop different and specific teaching styles and thus be able to apply ICT to PE teaching; this was necessary if the teachers were fully committed and wanted to be competent in this area.

Related to training, PE teachers' lack of mastery and experience using ICT in the educational context has also been a significant obstacle (Bisgin, 2014; Ertmer & Otternbreit-Leftwich, 2010; Hutchison & Reinking, 2011; Shan Fu, 2013), given that teachers who cannot develop certain skills in the course by using the technology available may face difficulties when transferring the content through traditional methods. Furthermore, another possible barrier is the teachers' lack of confidence to use more ICT in the classroom (Grainger & Tolhurst, 2005). Additionally, Willis (1993) indicates that other barriers may include teachers' personal comfort levels (Gibbone et al., 2010), given that using ICT may mean more workload in terms of organisational aspects (Petrie & Hunter, 2011), and a lack of motivation (Lane & Lyle, 2011; Liu & Szabo, 2009). Another obstacle highlighted by Shan Fu (2013) is PE teachers' low expectations regarding integrating ICT into the subject for improving students' learning (Al-Bataineh, Anderson, Toledo & Wellinski, 2008), as well as teachers' uncertainty about the possible benefits of using ICT in the classroom (Yildirim, 2007).

Another barrier is the context of the PE classroom, i.e., class size and the classroom itself, which are often factors that inhibit the use of technology in teaching PE and make it problematic for teachers to integrate ICT given the difficulty of managing students (Gibbone et al., 2010; Palak & Walls, 2009; Tezci, 2011).

Additionally, studies cite the lack of collaboration and cooperation between teachers, as well as a lack of support from institutions (Brinkerhof, 2006; Butler & Sellbom, 2002; Goktas, Yildirim & Yildirim, 2009; Papanastasiou & Angeli, 2008).

Obstacles perceived to incorporating ICT related to aspects regarding the effects of ICT on students

In terms of teachers' perceptions regarding the effect of ICT on students, Yildirim (2007) indicates that the students' and school's lack of ICT resources (hardware, software and suitable materials) is another obstacle. Moreover, the research finds that limitations on access to and availability of technology decrease opportunities for developing skills for using said technology in schools (Tearle & Golder, 2008); restricted access to technology and scarce available time also limits teachers in reserving computer rooms (Watson, 2001). This last obstacle is very closely related to the lack of technical and financial support (Liu & Szabo, 2009), as well as a lack of sufficient administrative support for the effective use of ICT (Lim, 2007).

Along these lines, another important obstacle to mention is the lack of technological infrastructure and equipment in the PE course. Administrations are not aware of the possibilities for using technology in PE or financial administrators may not view the gymnasium as the PE classroom (Pyle & Esslinger, 2014).

In relation to the cost of technology, the technology budget for PE is also a cause for concern, given that it is very limited (Thomas & Stratton, 2006). A study done by Kretschmann (2015) indicates that if the school director does not recognise ICT as a resource related to PE, he or she therefore cannot support the integration of technology into PE. Moreover, the principals' influence on the budget and school-wide curricular integration in terms of PE should not be underestimated (Staples, Pugach, & Himes, 2005).

Another important obstacle is the loss of time spent doing physical activity in PE. A majority of teachers recognises the positive aspects of technology in education, but they do not know how to put them into practice in their curriculum without taking hours away from time spent doing physical activity (Pyle & Esslinger, 2014). In this respect, technology should not replace PE teaching, but rather it should improve it (Juniu, 2011).

In this regard, the purpose of this study is to examine teachers' perceptions of the obstacles to integrating ICT into PE in secondary education by the degree to which they perceive them. This analysis will allow for a deeper understanding of the perception of barriers to the use of ICT and how to correct them, with the aim of being able to promote a greater educational use of ICT by PE teachers. Furthermore, this study analyses perceptions by age, given that some authors have found that older teachers are less willing to integrate ICT than younger teachers (Bisgin, 2014; Hammond et al., 2009; Lane & Lyle, 2011; Oblinguer & Oblinguer, 2005). In accordance with this general purpose, research questions are as follows:

1. What are the obstacles faced by PE teachers to integrated ICT in their classrooms?
2. Is the teachers' age an important factor that influences on the obstacles to integrated ICT in PE classrooms?

METHODOLOGY

Participants

The participants in this study were 400 secondary education PE teachers in the Autonomous Community of Madrid (Spain), of whom 254 were men (63.5%) and 146 were women (36.5%), with age groups ranging between 20-29 years old (n=20; 5%), 30-39 years old (n=121; 30.25%), 40-49 years old (n=138, 34.5%), and 50 years and over (n=121; 30.25%). The average age was 44.1 and the standard deviation 9.065.

Instrument

Standardised interviews were carried out using the "EFYTICS" questionnaire, created ah hoc for this purpose and previously validated using the Delphi method (19 university professors holding PhDs who are experts in ICT in PE), an expert panel (10 specialists), and a pilot study (40 PE teachers). To achieve the study's objectives, the item *teachers' perception of the obstacles to incorporating ICT into PE classes* was analysed. A Likert scale of 1-5 was used. The interaction of this item was studied in relation to age and Cronbach's alpha for this item (0.901) was used as a reliability criteria and showed excellent internal consistency.

Procedure and Data Analysis

A random sample of participants was used to perform this descriptive study. The research was approved by the University of Alcalá (Madrid) Ethics Committee. The interviews were carried out by the study's main researcher. Additionally, the participants were informed of the confidential nature of the interviews and their anonymity was assured. Then, the participants completed the questionnaire through a face-to-face oral interview with the interviewer (as is common practice for questionnaires in this type of study in Spain). The interviews were carried out in public and private schools and lasted an average of twenty minutes. All of the data were collected, organised and tabulated with SPSS software for Windows (V 19.0). The descriptive analysis was carried out using Pearson chi-squared and Phi.

RESULTS

The study found that PE teachers perceive all of the obstacles to integrating ICT that were analysed at percentages greater than 27.2% for agree and strongly agree (tables 1 and 2). In terms of the perception of obstacles to incorporating ICT related to aspects involving the teacher (table 1), 61.5% agree or strongly agree that integrating ICT into the teaching process involves an investment in time and in training PE teachers (M=3.6; SD=1.1); 51.5% say they do not know how to integrate ICT into the practice of physical activity (M=3.4; SD=1.1); and 48.2% of teachers perceive technical problems and the delays they could cause as an obstacle to integrating ICT (M=3.3; SD=1.1). However, the least perceived obstacles (between agree and strongly agree) were the resistance of teachers to changing methodologies (38%); the difficulty for teachers to manage students (32.7%); and the lack of teachers' interest in ICT (29.4%).

Table 1: Obstacles perceived to incorporating ICT related to aspects involving the teacher

	Strongly disagree		Disagree		Neither agree nor disagree		Agree		Strongly agree		M	SD
	N	*%*	*N*	*%*	*N*	*%*	*N*	*%*	*N*	*%*		
Lack of knowledge for integrating ICT	28	7	54	13,5	112	28	141	35,3	65	16,2	3,4	1,1
Investment in time and training	25	6,3	43	10,7	86	21,5	157	39,3	89	22,2	3,6	1,1
Difficulty in managing students	37	9,3	79	19,7	153	38,3	103	25,7	28	7	3	1
Lack of interest in ICT	43	10,8	91	22,8	148	37	98	24,4	20	5	2,9	1
Resistance to changing methodologies	39	9,7	84	21	125	31,3	119	29,8	33	8,2	3,1	1,1
Little confidence and technical problems	27	6,8	56	14	124	31	142	35,5	51	12,7	3,3	1,1
Organisational problems and a lack of support and information from the institution	36	9	63	15,7	137	34,3	115	28,7	49	12,3	3,2	1,1

In terms of the obstacles that obtained the highest percentages in relation to aspects regarding the effects of ICT on students (table 2), a high percentage of teachers (64.4%) agree or strongly agree that ICT in PE lead to a decrease in the time students spend doing physical activity in class (M=3.8; SD=1.1); followed by the students' or the school's lack of material and economic resources with 63.2% (M=3.7; SD=1.2); and the students' unsuitable use of ICT with 54.9% (M=3.6; SD=1). The least perceived obstacles (between agree and strongly agree) were that ICT increase the students' isolation (38.2%); the students' superficial learning (28.9%); and loss of students' attention (27.2%).

Table 2: Obstacles perceived to incorporating ICT related to aspects regarding the effects of ICT on students

	Strongly disagree		Disagree		Neither agree nor disagree		Agree		Strongly agree		M	SD
	N	*%*	*N*	*%*	*N*	*%*	*N*	*%*	*N*	*%*		
Lack of material and economic resources	30	7,5	36	9	81	20,3	139	34,8	114	28,4	3,7	1,2
Loss of physical activity time	19	4,8	33	8,3	90	22,5	133	33,2	125	31,2	3,8	1,1
Superficial learning	27	6,8	77	19,3	180	45	85	21,2	31	7,7	3,1	1
Increase in a sedentary lifestyle and obesity	41	10,3	78	19,5	111	27,8	103	25,7	67	16,7	3,2	1,2
Unsuitable use	15	3,8	40	10	125	31,3	146	36,5	74	18,4	3,6	1
Loss of attention	41	10,3	93	23,2	157	39,3	80	20	29	7,2	2,9	1
Abuse of use and dependence	32	8	44	11	113	28,3	132	33	79	19,7	3,5	1,2
Students' isolation	35	8,7	79	19,8	133	33,3	106	26,5	47	11,7	3,1	1,1
Excessive work on theoretical content	23	5,8	74	18,5	107	26,8	131	32,8	65	16,1	3,3	1,1
Excess of virtual reality	26	6,5	71	17,8	137	34,3	106	26,4	60	15	3,3	1,1

By age, with regard to the aforementioned obstacles related to teachers (table 3), significant differences have been found with considerable and moderate relationships in the obstacles most highly perceived by teachers 30 years or older: the investment in time and teacher training (phi=0.696; p=0.036) with percentages between 60.4% and 66.1%; and a lack of knowledge from students and teachers to integrate ICT into the practice of physical activity (phi=0.354; p=0.021), with percentages between 47.2% and 56.2%. However, these two obstacles have been perceived in second place by teachers from 20-29 years old, although with different percentages. The next most perceived obstacle by teachers in the 20-29 age range was organisational problems and a lack of support from the institution where they work (30%). This same obstacle is also the third most perceived by teachers over 50 years old, while the most perceived obstacle for teachers between 30 and 49 years old is a lack of confidence in the media. It should be noted that the obstacles of lack of teachers' interest in ICT, the difficulty for the teacher to manage students, and organisational problems were the least perceived (between agree and strongly agree) for teachers from 30 to 49 years old, with different percentages. A lack of interest was also the second least perceived obstacle by teachers from 20-29 years old and for those over 50 years old. The least perceived obstacle by the youngest teachers is the resistance to changing methodologies (25%).

Table 3: Obstacles perceived to incorporating ICT related to aspects involving the teacher according to age

	Age	Strongly disagree		Disagree		Neither agree nor disagree		Agree		Strongly agree		X^2
		N	*%*	*N*	*%*	*N*	*%*	*N*	*%*	*N*	*%*	
Lack of knowledge for integrating ICT *	20-29 years	2	10	9	45	2	10	4	20	3	15	50.228
	30-39 years	7	5.8	16	13.2	30	24.8	54	44.6	14	11.6	
	40-49 years	10	7.2	16	11.6	38	27.5	47	34.1	27	19.6	
	50 years and more	9	7.4	13	10.7	42	34.7	36	29.8	21	17.4	

Investment in time and training *	20-29 years	2	10	5	25	6	30	4	20	3	15	34.813
	30-39 years	8	6.6	14	11.6	19	15.7	54	44.6	26	21.5	
	40-49 years	6	4.3	13	9.4	33	23.9	54	39.1	32	23.3	
	50 years and more	9	7.4	11	9.1	28	23.1	45	37.2	28	23.2	
Difficulty in managing students	20-29 years	4	20	6	30	3	15	6	30	1	5	27.858
	30-39 years	13	10.7	24	19.8	41	33.9	32	26.4	11	9.2	
	40-49 years	10	7.2	28	20.3	56	40.6	36	26.1	8	5.8	
	50 years and more	10	8.3	21	17.4	53	43.8	29	24	8	6.5	
Lack of interest in ICT	20-29 years	3	15	7	35	7	35	2	10	1	5	33.862
	30-39 years	13	10.7	25	20.7	45	37.2	32	26.4	6	5	
	40-49 years	12	8.7	41	29.7	48	34.8	34	24.6	3	2.2	
	50 years and more	15	12.4	18	14.9	48	39.7	30	24.8	10	8.2	
Resistance to changing methodologies	20-29 years	4	20	5	25	6	30	4	20	1	5	40.110
	30-39 years	11	9.1	23	19	37	30.6	40	33.1	10	8.2	
	40-49 years	8	5.8	35	25.4	39	28.3	47	34.1	9	6.4	
	50 years and more	16	13.2	21	17.4	43	35.5	28	23.1	13	10.8	
Little confidence and technical problems	20-29 years	3	15	5	25	3	15	7	35	2	10	39.777
	30-39 years	9	7.4	13	10.7	35	28.9	50	41.3	14	11.7	
	40-49 years	7	5.1	18	13	42	30.4	48	34.8	23	16.7	
	50 years and more	8	6.6	20	16.5	44	36.4	37	30.6	12	9.9	
Organisational problems and a lack of support and information from the institution	20-29 years	5	25	3	15	6	30	4	20	2	10	37.530
	30-39 years	10	8.3	24	19.8	40	33.1	32	26.4	15	12.4	
	40-49 years	10	7.2	18	13	55	39.9	42	30.4	13	9.5	
	50 years and more	11	9.1	18	14.9	36	29.8	37	30.6	19	15.6	

*p≤0.05; **p≤0.01

In terms of the teachers' perceptions by age regarding aspects related to the effects of the use of ICT on students (table 4), teachers over 30 years old perceive ICT to lead to a decrease in time students spend doing physical activity in class (between 64.4% and 66.1%), followed by the obstacle of a lack of material and economic resources (between 61.1% and 65.3%). This last obstacle is significant (phi=0.371; p=0.007) and the relationship is moderate. In the 20 to 29 years range, teachers perceive the greatest obstacle (between agree and strongly agree) to be the unsuitable use of ICT by students (65%), followed at the same percentage (50%) by the loss of time spent doing physical activity, a lack of resources, and the students' abuse of use. The third most perceived obstacle varies between each age range; the youngest teachers perceive it to be the loss of students' attention at 45%. This obstacle is significant (phi=0.327; p=0.046) and the relationship is moderate. For teachers between 30-39 years old, it is the unsuitable use of ICT by students (61.2%); for those aged 40-49 it is the students' abuse of use (51.5%); and for those over 50 years old, it is the excess of theoretical content (56.2%). The fourth most perceived obstacle by the youngest teachers is the excess of virtual reality in ICT (40%). This obstacle is significant (phi=0.374; p=0.005) and the relationship is moderate.

The least perceived obstacles for teachers over 40 years old (between agree and strongly agree) were the loss of students' attention (between 18.2% and 31.4%) and students' superficial learning (between 26.9% and 33.9%). Between 30 and 49 years, the third least perceived obstacle was the students' isolation, with percentages between 33.9% and 37%.

Table 4: Obstacles perceived to incorporating ICT related to aspects regarding the effects of ICT on students according to age

	Age	Strongly disagree		Disagree		Neither agree nor disagree		Agree		Strongly agree		X^2
		N	*%*	*N*	*%*	*N*	*%*	*N*	*%*	*N*	*%*	
Lack of material and economic resources *	20-29 years	3	15	6	30	1	5	6	30	4	20	54.910
	30-39 years	14	11,6	8	6,6	20	16,5	50	41,3	29	24	
	40-49 years	5	3,6	8	5,8	35	25,4	44	31,9	46	33,3	
	50 years and more	8	6,6	14	11,6	25	20,7	39	32,2	35	28,9	
Loss of physical activity time	20-29 years	3	15	4	20	3	15	5	25	5	25	35.202
	30-39 years	3	2,5	13	10,7	25	20,7	41	33,9	39	32,2	
	40-49 years	5	3,6	6	4,3	37	26,8	45	32,6	45	32,7	
	50 years and more	8	6,6	10	8,3	25	20,7	42	34,7	36	29,7	
Superficial learning	20-29 years	3	15	6	30	6	30	4	20	1	5	37.457
	30-39 years	10	8,3	23	19	55	45,5	25	20,7	8	6,5	
	40-49 years	9	6,5	30	21,7	62	44,9	27	19,6	10	7,3	
	50 years and more	5	4,1	18	14,9	57	47,1	29	24	12	9,9	
Increase in a sedentary lifestyle and obesity	20-29 years	3	15	3	15	7	35	4	20	3	15	40.637
	30-39 years	18	14,9	23	19	33	27,3	30	24,8	17	14	
	40-49 years	9	6,5	28	20,3	41	29,7	35	25,4	25	18,1	
	50 years and more	11	9,1	24	19,8	30	24,8	34	28,1	22	18,2	
Unsuitable use	20-29 years	2	10	1	5	4	20	7	35	6	30	30.648
	30-39 years	3	2,5	9	7,4	35	28,9	57	47,2	17	14	
	40-49 years	3	2,2	19	13,8	45	32,6	44	31,9	27	19,5	
	50 years and more	7	5,8	11	9,1	41	33,9	38	31,4	24	19,8	
Loss of attention *	20-29 years	2	10	7	35	2	10,0	6	30	3	15	42.829
	30-39 years	10	8,3	28	23,1	46	38,0	28	23,1	9	7,5	
	40-49 years	14	10,1	34	24,6	65	47,1	17	12,3	8	5,9	
	50 years and more	15	12,4	24	19,8	44	36,4	29	24,0	9	7,4	
Abuse of use and dependence	20-29 years	2	10	5	25	3	15,0	5	25	5	25	30.335
	30-39 years	9	7,4	17	14	31	25,6	41	34	23	19	
	40-49 years	10	7,2	11	8	46	33,3	41	29,7	30	21,8	
	50 years and more	11	9,1	11	9,1	33	27,3	45	37,2	21	17,3	
Aislamiento del alumno	20-29 years	4	20	5	25	7	35	2	10	2	10	39.436
	30-39 years	9	7,4	31	25,6	40	33,1	31	25,6	10	8,3	
	40-49 years	9	6,5	28	20,3	50	36,2	36	26,1	15	10,9	
	50 years and more	13	10,7	15	12,4	36	29,8	37	30,6	20	16,5	
Excessive work on theoretical content	20-29 years	1	5	8	40	8	40	3	15,0	0	0	38.390
	30-39 years	8	6,6	23	19	30	24,8	47	38,8	13	10,8	
	40-49 years	8	5,8	24	17,4	41	29,7	39	28,3	26	18,8	
	50 years and more	6	5	19	15,7	28	23,1	42	34,7	26	21,5	
Excess of virtual reality *	20-29 years	2	10	5	25	5	25	7	35	1	5	56.033
	30-39 years	9	7,4	26	21,5	44	36,4	29	24	13	10,7	
	40-49 years	7	5,1	32	23,2	46	33,3	29	21	24	17,4	
	50 years and more	8	6,6	8	6,6	42	34,7	41	33,9	22	18,2	

*p≤0.05; **p≤0.01

DISCUSSION

This study found that the most perceived obstacles by PE teachers in terms of their perceptions of how integrating ICT would affect aspects involving the teacher (between agree and strongly agree) were the investment in time and PE teacher training, a lack of knowledge for integrating ICT in the practice of physical activity, and technical problems and the delays they may cause. With regard to age, the most perceived obstacles coincide in all age ranges, although with different percentages and orders of perception.

Various studies also find the time investment to be a large obstacle to the use of ICT in PE (Almekhlafi & Almeqdadi 2010; Grainger & Tolhurst, 2005; Legrain et al., 2015), mainly in terms of learning, practice, planning, and trying to integrate ICT into teaching curricula. Additionally, training is also considered by other studies to be a barrier for ICT integration (Cuckle & Clarke, 2003; Grainger & Tolhurst, 2005).

In relation to the lack of knowledge to integrate ICT into PE practice, Thomas and Stratton (2006) argue that although an individual may have a high skill level with ICT for their personal use, transferring this knowledge to the classroom is complicated. Bisgin (2014) cites the lack of PE teachers' mastery of ICT as a significant barrier to introducing them into their teaching process. Kretschmann (2015) and Yaman (2008) argue that insufficient knowledge and experience with ICT in PE influence the application and promotion of ICT use in the subject.

In terms of delays caused by technology, Grainger & Tolhurst (2005) reference teachers' lack of confidence when they use ICT in the classroom. Almekhlafi and Almeqdadi (2010) and Yildirim (2007) indicate that this lack of confidence may be caused by a fear of failure due to technical problems (Hixon & So, 2009), as well as accidents and failures that may arise during the classes.

The least perceived obstacles (between agree and strongly agree) were: a resistance to changing methodologies, the difficulty for teachers to manage students, and the lack of teachers' interest in ICT. These results are supported by several authors such as Petrie and Hunter (2011), who found that ICT are seen as an external pressure for teachers in curricular and organisational changes and they create additional work. Moreover, other authors mention other obstacles, such as the number of students in the class, as this makes it more difficult for the teacher to manage students (Tezci, 2011); the teachers' personal comfort (Gibbone et al., 2010); and their lack of motivation (Lane & Lyle, 2011; Liu & Szabo, 2009).

These obstacles have been the least perceived in all age ranges at different percentages, although between 20 and 49 years old, teachers also underlined organisational problems and a lack of information and support from the school. In this regard, some authors (Brinkerhof, 2006; Ertmer & Otternbreit-Leftwich, 2010; Hutchison & Reinking, 2011; Lane & Lyle, 2011) highlight the lack of collaboration and cooperation between teachers, as well as a lack of pedagogical and technological support.

In this study we can see that in terms of the obstacles to integrating ICT related to aspects involving the teachers, teachers between 30-39 years old and 40-49 years perceive the majority of obstacles in higher percentages. This coincides with the study done by Lane and Lyle (2011), which concludes that in several cases the middle-aged group perceives the barriers to a greater extent than the younger teachers and the oldest teachers.

In terms of the obstacles to integrating ICT related to aspects of how their use affects students, the most perceived are the students' loss of physical activity time in class, a lack of students' or the school's material and economic resources, and the unsuitable use of ICT by students. Regarding the loss of physical activity time, Pyle and Esslinger (2014) indicate that technology and PE are often seen as being on opposite extremes between a sedentary lifestyle and the movement that the class requires. Similarly, the study done by Kretschmann (2015) finds that PE teachers at first do not think that ICT and their class are connected given that the main objective of the class is motor in nature.

In terms of the lack of resources, the scarcity of infrastructure and technological equipment is one of the obstacles that the PE class faces according to Pyle and Esslinger (2014). The budget and therefore the cost of this equipment is also a cause for concern where the budgets for PE are restricted (Thomas & Stratton, 2006).

With regard to the unsuitable use of ICT by students, Moisescu (2014) and Ugarte and Ros (2015) indicate that we must not ignore the abuse of technology and the dependence or addition that students may develop to technology if used incorrectly.

Depending on age, these obstacles were also the most highly perceived by teachers with different percentages and different orders of perception. Older teachers (over 50 years old) have the highest percentages in the majority of the obstacles considered.

The least perceived obstacles (between agree and strongly agree) were that ICT increase the students' isolation, the students' superficial learning, and loss of students' attention in class. In terms of the first of these, Moisescu (2014) indicates that specialists have shown that spending a lot of time in front of the computer affects concentration levels, aggression levels, isolation, etc.

By age, the least perceived obstacles were the same, but with different percentages and order of perception, and additionally included an excess of theoretical content among teachers aged 20-29 and an increase in sedentary lifestyle among older teachers (over 50 years old). With regard to the latter, Hall (2012) states that interactive technology can be a solution for solving the problem of inactivity and a sedentary lifestyle.

CONCLUSIONS

Because of the class' particular characteristics, the integration of technology into PE needs alternatives for improving its application in the educational context. For this reason, we must analyse the obstacles teachers face in order to investigate possible strategies that could help to decrease these barriers. This would allow for an educational use of ICT in the class and for an enjoyment of all the benefits and potentials that they offer in the teaching and learning process (Karsenti & Lira, 2011).

This study found that the obstacles most frequently perceived by teachers, regardless of age, were: loss of time spent doing physical activity, lack of resources, investment in time and training, unsuitable use of ICT, lack of knowledge of how to integrate them, and technical problems.

Given these results, we must prioritise strategies to reduce these barriers, such as: provide activities and workshops on how to make educational use of ICT in the PE classroom without reducing physical activity time; offer adequate technical support in schools; increase curricula with improved technological materials; provide teachers with the freedom to choose their curricular material; and promote positive attitudes towards the importance of integrating ICT into teaching (Goktas et al., 2009; Lim, 2007; Shan Fu, 2013; Tezci, 2011).

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