

The Perceptions of Early Childhood Educators Regarding the Uses of the Interactive Whiteboard

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ABSTRACT

Nowadays, there is an increase in the use of the Interactive White Board (IWB) in the classroom. This allows the instructor to integrate new and more attractive learning methodologies towards the learning process. In early childhood education the instructor relies too much on images, making the IWB a great teaching resource. However, are teachers prepared to use and implement the IWB? Do they consider it a good resource towards this educational stage? From these questions and through an ad-hoc questionnaire, a multiple case study was conducted with early childhood educators (N=30) from different public schools in Córdoba, Spain. From these questions and through an ad-hoc questionnaire, a multiple case study was conducted with early childhood educators (N=30) from different public schools in Córdoba, Spain. As a result, it's recommended that the government takes action and implement a teacher training program along with improving the Internet accessibility of the schools.

KEYWORDS

Interactive WhiteBoard, teachers' knowledge, teachers' competence, information technology

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Introduction

Nowadays and for some decades now, information and communications technologies (ICT's) have achieved a great influence on society and culture, under that we could say we live in a "digital age" (Buckingham, 2008; Perez, 2012). We create and use ICT's to improve and change our lives (Domínguez, 2009). This is due in part that we live in a globalized world where media exert great influence.

New generations of children, born in the last decade of the 20th century and in the current 21st, since birth, they live and grow up surrounded by technology. At early ages they become digital experts, spending many hours in front of television and the Internet, and even getting to manipulate and use

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equipment such as computers, the tablets, mobile devices, and video games. Perceiving and sensing all these equipment are part to their surroundings and to their reality, thus presenting a new vision to the world, which differs greatly from their parents, who generally grew up only with a television. This creates and produces a “digital gap” two between the generations (Buckingham, 2008).

The necessity to incorporate the ICT's to the classrooms and some of it is tools, as it is the case of the Interactive White Board (IWB), present several aspects that must be analyzed and addressed by the educational community. Some include: advantages and disadvantages provided by the IWB for educators, the suitability of the locations, and perhaps most important, as presented by Gregorio and Sobel-Lojesk, 2010 and Sad and Özhan, 2012, the lack of training by the educators which provokes a lack of use and loss of motivation.

Literature Review

The development of knowledge has been affected by the digitalization of society and of the culture, by having varied access to all type of information through the ICT's, (Sancho and Correa, 2013). The school cannot be fitted simply to transmit and to expose information (since this change is permanent), and its functions and those of the teacher have changed, adapting to the new necessities that society demands. It's fundamental that the professor continues its education in order to mediate, advice, and guide the students (Sancho and Correa, 2013). The professor is dealing with a new scholastic model that integrates the teacher and learner, and must teach the subjects/courses using the most useful technologies at every moment. The educator must prepare the learners with the ability to transform the information that they receive into knowledge (Perez, 2012). At the present time most children live in technological surroundings and it's necessary that starting at an early age they receive correct formation/training, and acquire a critical attitude toward the use of the ICT's.

According to Perez (2012), the best way to carry ICT education with children is approaching them toward new technologies in which we lived, and presenting the valid purpose and functionality of technology. For that reason, it is fundamental to introduce these technologies in the classroom and take advantage of the resources that are offered to us. The school must evolution along with society.

The use of ICT's generate in the school a great variety of experiences, making possible to open the classrooms doors and walls, to the necessities of the surroundings, and facilitating the learning process. Thanks to them we have a combination of texts, voices, sounds, videos, animations, drawings, photography, that enrich the children experiences, adolescents and people in general. One of the technologies used with great effectiveness during the teaching and learning processes nowadays is the IWB (Heemskert, Kuiper and Meijer, 2014). It offers the opportunity for the educator to converge depending the learning style (Gallego, Gatica, Valdivia, Alonso, Krause, Jiménez, Cacheiro, Venegas y Palma, 2010). These are among other elements, which reflect the data gathered by Heemskert, Kuiper and Meijer, 2014, which indicated in 2011 that 97% of elementary schools had this resource installed and full, capable. This is not currently the case in Spain where is projected to provide this experience to children in all classrooms in a few years from now. This will open opportunities for early childhood educators and for the students. However, plenty of studies

validate the use of the IWB including those by Albealy and Higgins (2011), Bidaki and Mobasheri, (2013), Dulac (2006), Gallego, Gatica et al. (2010), Sad (2012), Sad and Özhan (2012), Schamid (2008), Schuck and Kearney (2007), which reflects its high presence, and didactic possibilities toward teaching.

According to Gallego, Gatica, et al. (2010) and Sad and Özhan (2012) it is an excellent resource for learning, and great support for the educator, because it deals with shared material between the professor and the students, giving the learner the opportunity to be in a starring or protagonist position or in control of its own learning. Consequently, by being a type of “learning by discovery” the learning experience takes place during the interaction between the IWB and the students. They will be acquiring autonomy and sense of responsibility. We could say that its attention increases, like its implication and interest if the classroom activities are made through this means, more than of a traditional form. We shared with Gallego, Gatica, et al. (2010) that with this digital tool, new forms of interaction between the children and the teacher takes place, promoting a collaborative and active working environment.

Diverse investigations (Schuck and Kearney, 2007; Alonso and Martin, 2011; Marques, 2006; Sad, 2012; Sad and Özham, 2012), show how the use of the classroom surroundings become more dynamic and motivational for the learners as for the professor. The activities are more innovating, attractive and facilitate the students the teaching explanations. In addition, by integrating multimedia and Internet resources the learners become more pro-active.

In addition to the previously indicated advantages that the IWB provides, there is also the possibility to store the class interventions. This provides the opportunity of remembering what was worked during other sessions, along with providing feedback, and learning activation and consolidation. The class is transformed into a dynamic and enjoyable setting for the learner and at the same time provides them with real life contextualized experiences (Gallego, Gatica, et al., 2010).

On the other hand, research performed by Marques (2006), Digregorio and Sobel-Lojeski (2010), Alonso and Martin (2011) and Prats, Laughed, Gandol, Cheek (2011), mention that the use of the IWB present some problems like:

- Loss or problems with calibration
- Changes in roles and responsibilities, not every professor is willing to innovate and to make something new, although the results are better.
- High costs of the projector and the interactive screen, along with the maintenance of the resource.
- Shade in the screen produced by the inadequate position of and educator or student, or by bad illumination of the classroom.
- No connection to the Internet.
- Lack of proper pedagogical training with the tool.

As we see, in its majority they are referred to technical questions instead of pedagogical questions. Nevertheless, the biggest handicap reflected in research is the lack of formal teacher training toward with the use of the IWB (Sad, 2012; Sad and Özhan, 2012).

We shared along with research made by Garavaghio, Gonzia and Petti (2013) that the ICT's are not going to produce an educational innovation in the

education-learning processes singly, it is through the technological training of the educators that this is obtained, for that reason is not enough to have an IWB in the classroom, but rather that the teaching staff who uses it in his daily work, must have the didactic and technological training to adapt and being able to use it correctly, taking advantage of the maximum of the possibilities and resources that it offers. (Marques, 2006; Alonso and Martin, 2011).

It is necessary that the professor receives a continuous formation that enables him in the digital or technological aspects like in the didactic and pedagogical aspects. For example, they would have to receive certain formation/training in computer science to solve small technical problems, without it is necessary the presence of a specialist. For example: what to do if the projector shut downs? , If the Internet connection is disrupted? How to compress and decompress archives? (Prats, Riera et al, 2011). On the other hand, the training would have to advise them and also provide the necessary aid for them so that they are able to design applicable activities by themselves in the classroom, in order to innovate with their own (Marques and Domingo, 2010).

Methodology

In order to start this research there are several questions that will help acquire the valid information: Is the use of the IWB an advantage for early childhood education? Do the early childhood educators had the necessary training? Do the location of the IWB determines it use in class?

From these questions we have determined the following objectives of work:

- 1- To identify some of the possible educational applications and functionalities of the IWB in early childhood education [3-6 years]
- 2- To establish the value that the educators have for the IWB.
- 3- To know the possible advantages and improvements that supposes the use of the IWB early childhood education has for the teaching and learning process.
- 4- To identify the main problems or disadvantages that the use of the IWB brings to early childhood education.
- 5- To verify if the integration of the IWB changes the teaching methodology.
- 6- to detect if the teaching staff receives the sufficient formation/training for the use of the IWB in the classroom.

3.1 Data gathering instrument

For the data collection, the method of the survey was used, and the technique of the questionnaire. It provides an educative research approach towards the possibility of obtaining by means of the formulation of questions, answers to the marked targets, as well as of establishing differences and/or similarities between diverse factors (Reche, 2012). A test of validity and reliability was performed to the questionnaire to make sure it measured the objectives.

The instrument included 42 items distributed in 5 dimensions. First, the demographics of the participants were determined. This included gender, course, years of experience with the IWB, as well as the school location. The answering scale was measured between 0 and 10 and the location in Yes or No. The rest of the items can be seen in table 1.

Table 1. Distribution of the dimensions of the questionnaire

Source: Own elaboration

<i>Name of the dimension</i>	<i>N^o of items</i>
Advantages that supposes the use of the IWB in the classroom	15
Problems when using the IWB	7
Educational applications of the IWB	6
Functionalities of the IWB	4
Formation/training of the teaching staff to use the IWB	6

All the dimensions used a Likert scale of 5 options, where 1 meant totally disagree, 2 disagree, 3 indifferent, 4 agree and finally 5 correspond to totally agree, except for second that presents/displays one it formulates of answer with two options, - yes/no-.

With regards to the validity, it was given to a panel of experts. The panel was conformed, by a group of professors who met the following criteria:

1. More than 10 years of experience with the use of the ICT's in the classroom
2. At least 3 years of experience using the IWB in the classroom
3. To have received in the last two years technological training courses

As a result, 4 professors fitted the criteria, 3 men and one woman. In the case of the male professors they had between 12 and 11 years respectively using the ICT's, while the female had 15 years of experience. On the other hand in regards to the use of the IWB in the classroom the four had been 3 years of experience. Finally, they all had received technological teacher training prior to the development of this research.

The valuation of the judges was positive, being oriented to the grouping of the items and to the definition of the dimensions in which they were finally grouped, since initially they were not it.

In order to determine the reliability of the instrument an Alpha- Cronbach test was made. It reached a reliability of 0.89, which according to Mateo (20004) it can be considered as reliable.

Also the reliability was made item by item, taking care of the established dimensions, providing similar results (to see table 2) to the general of the instrument, reason why it is possible to be considered that the instrument enjoys a high reliability.

Table 2. Discrimination of items by dimensions

Source: Own elaboration

<i>Dimensión</i>	<i>Alpha of Cronbrach</i>
Advantages that supposes the use of the IWB in the classroom	0.891
Problems when using the IWB	0.879

Educative applications of the IWB	0.898
Functionalities of the IWB	0.900
Formation/Training of the teaching staff to use the IWB	0.869

3.2 Participants and sample

The participant population in this study initially was conformed, by early childhood educators of Cordova, and its province. After a random stratified sampling the total was conformed, by the teaching staff of this educative level of 6 centers located in the province and one in the capital.

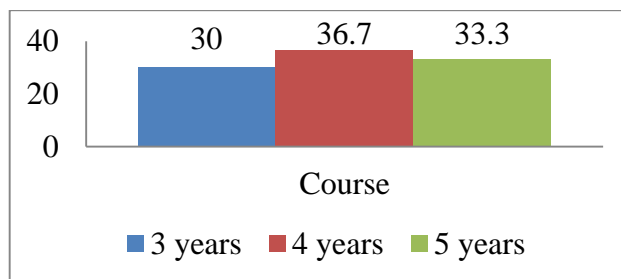
Gender wise there is a 16.7% of men and 83.3% of women, as we observed is greater the participation female educators. Based on the geographic situation and the course in which they give class, the sample has been distributed such and as it is appraised in table 3. There is a bigger presence of educators from Montilla (36.7%) and Cordova (36.7%), 20% of the belong to center of the capital, a 10% of the Sanctuary zone, and 6.7% of the South sector

Table 3. Distribution of the sample by geographic location of the center

Source: Own elaboration

	<i>Frequency</i>	<i>%</i>
Montilla	11	36.7
Palm of Rio	3	10.0
Quintana village	1	3.3
Cordova	11	36.7
Monturque	3	10.0
Montalbán	1	3.3

As Graphic 1 attests, the sample is almost similar, being slightly superior in the course of 4 years.



Graph 1. Distribution of the sample based on the specialty

Source: Own elaboration

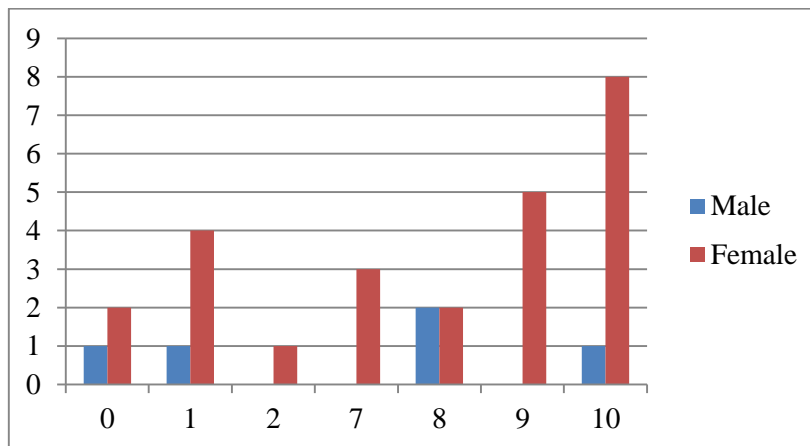
Based on the years that the participants have been using the IWB, we see that 40% of them average 2 years, 5% 1 year, a 2% 5 years and 4% between 3 and 4 years. It is significant that 6.7% of the participants in this study are not using it even having it in the school; we wanted to also stand out, the hours that indicate the subjects that use the IWB in their classrooms, tie to the years of use of this. As we can see in the table 4, they emphasize two educators ones that they declare to use it to the month around the 600 hours as opposed to 10 that they declare to never use it

Table 4. Distribution of the sample based on n° of hours of use of the IWB in the month

Source: Own elaboration

<i>N° of professors</i>	<i>N° of hours of use</i>	<i>%</i>
10	0	33.3
2	4	6.7
1	6	3.3
2	8	6.7
1	10	3.3
2	20	6.7
1	22	3.3
1	29	3.3
2	30	6.7
1	40	3.3
1	50	3.3
2	60	6.7
2	80	6.7
2	600	6.7

It's important to emphasize the general valuation done by users of the IWB. As we can see in the Graphic 2, the females value and use more the IWB (9 and 10 respectively) than men (8 and 10). It is significant to emphasize that males are located or in a positive or very positive valuation or in the negative end, whereas the women present/display uniform valuations.



Graphic 2. Valuation of the IWB based on gender

Source: Own elaboration

In regards to the physical location of the IWB, we verified that in most of the schools either one is located in the own classrooms of the educators participating in this study or in the computer science classrooms (to see table 5)

Table 5. Physical location of the IWB

Source: Own elaboration

	<i>Frequency</i>		<i>%</i>	
	<i>If</i>	<i>no</i>	<i>If</i>	<i>no</i>
In the classroom	19	11	63,3	36.7
Movable IWB (cart or closet with wheels)	0	27	0	90

Multiple classroom of use	11	16	40,7	59.3
Computer Science classroom	5	21	18,5	77.8

Results

Following the structure of the questionnaire, the results will be presented following the 5 dimensions previously indicated.

4.1 Descriptive study

Dimension 1: ADVANTAGES THAT SUPPOSES THE USE OF THE IWB IN THE CLASSROOM

Table 6. Descriptive study Dimension 1

Source: Own elaboration

	<i>Frecuency</i>					<i>%</i>					<i>M.</i>	<i>D.T.</i>
	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>		
It increases the satisfaction and educational self-esteem	1		9	6	14	3.3		30	20	46.7	4.07	1.048
It increases the motivation and the attention of the pupils (in general)			2	9	19			6.7	30	63.3	4.57	.626
It facilitates the access to a great variety of resources				8	22				26.7	73.3	4.73	.450
It facilitates to the students the understanding of the contents and subjects			4	11	15			13.3	36.7	50	4.37	.718
It increases the motivation of the teaching staff			6	9	14			20	30	46.7	4.28	.797
It is a great support for the educational task			3	7	20			10	23.3	66.7	4.57	.679
It allows the student to have a starring role of its learning			5	7	18			16.7	23.3	60	4.43	.774
The students participate and are more interested in the activities	1		5	5	19	3.3		16.7	16.7	63.3	4.40	.894
It promotes active and collaborative work	3		2	9	16		10	6.7	30	53.3	4.27	.980
The class is fun and dynamic			5	6	19			16.7	20	63.3	4.47	.776
It improves the teaching process			5	11	14			16.7	36.7	46.7	4.30	.750
It improves the learning process			3	14	13			10	46.7	43.3	4.33	.661
It facilitates the attention towards diversity	1		3	14	12	3.3		10	46.7	40	4.23	.774
The activities are more attractive			3	6	21			10	20	70	4.60	.675
It facilitates the collective accomplishment of activities, readings, etc.			2	10	18			6.7	33.3	60	4.53	.629

As we can observe in the first dimension, 46.7% of the consulted teaching staff considers that the use of this instrument in the classroom increases the satisfaction and educational self-esteem towards the integration of the ICT's, on the other hand 3.3% are opposed or do not agree with this affirmation.

Also, we can see that 63.3% of the participants think that the use of the IWB causes that the students become more interested and participative in the proposed activities, as opposed to a 3.3% that they do not agree.

In addition, diversity of opinions within the affirmation that indicates that the use of the IWB in the classroom promotes the active and collaborative work of the students with 53.3% of the teaching staff supporting it totally, against a 10% that does not agree with it. We can also observe different opinions as far as if the IWB facilitates the attention towards diversity, since 40% and 46.7% of the sample respectively totally agree and agree totally this affirmation, whereas 3.3% did not agree.

The two affirmations that count on a greater number of people than are totally in agreement with them are the following ones: “it facilitates the access to a great variety of resources” with a 73.3% and “the activities are more attractive” with a 70%, next to a 66.7% that affirms that it is a great support to the educational task.

Also, it is important to indicate, that the collected data indicate that the use of this novel tool in the classroom, generally, increases to the attention and motivation of the pupils, since counts on the support of a 30% (agree) and a 63.3% (totally agree) of the participants.

Dimension 2: PROBLEMS WHEN USING THE IWB

After analyzing the data, we can see that the IWB in the classroom shows mainly three problems. Two of them include calibration, which happens to 63.3% of the participants, and the lack of technological and didactic training shows 66.7%. The problem or disadvantage that apparently is the one that occurs more in the classroom is the lack of connection to Internet that exposes 83.3% of the sample, as opposed to a 16.7% that it does not present/display this problem when using it.

Table 7. Descriptive study dimension 2

Source: Own elaboration

	<i>Frecuency</i>		<i>%</i>		<i>M.</i>	<i>D.T.</i>
	<i>1</i>	<i>2</i>	<i>1</i>	<i>2</i>		
Shade in the interactive screen	14	15	46.7	50	1.60	.675
Problems of connection to Internet	25	5	83.3	16.7	1.17	.379
High cost of maintenance of the equipment	18	11	60	36.7	1.33	.547
Problems of calibration	19	11	63.3	36.7	1.37	.490
The pencil (or finger) does not write well	14	16	46.7	53.3	1.53	.507
Lack of technological or didactic training	20	10	66.7	33.3	1.33	.479
Distraction of the students	5	25	16.7	83.3	1.83	.379

Dimension 3: EDUCATIONAL APPLICATIONS OF THE IWB

Table 8. Descriptive study dimension 3

Source: Own elaboration.

	<i>Frecuency</i>					<i>%</i>					<i>M.</i>	<i>D.T.</i>
	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>		
Accomplishment of exercises and activities of collaboratively			3	14	13			10	46.7	43.3	4.33	.661
Correction of exercises among all with the IWB		1	5	10	14		3.3	16.7	33.3	46.7	4.23	.858
Vision of videos, pages Web, stories...			2	5	23			6.7	16.7	76.7	4.70	.596
Searches of joint form in	4	1	7	2	16	13.3	3.3	23.3	6.7	53.3	3.83	1.464

Internet (professor and pupils)												
The professor explains activities and subjects	11	19						36.7	63.3	4.63	.490	
The professor presents/displays materials and resources	11	19						36.7	63.3	4.63	.490	

As far as the 3rd Dimension, we can observe, that in this stage of early childhood education, the main use of the IWB is to project videos, pages Web, stories as 76,6% attest. Next, we can find the explanation of subjects and the presentation of materials and resources on the part of the professor with a 36.7% of the participants who agree, and a 63.3% that totally agree.

It's remarkable the diversity of opinion that occur as far as the uses of the IWB in the classroom: As we can observe, 46.7% of the consulted participants consider that it uses this tool to assess exercises and work activities, meanwhile 3.3% do not agree with this affirmation. Also, we see that a 53.3% of the teachers use it to do Internet joint searches as opposed to a 13.3% that totally disagree with this affirmation, and 3.3% that disagree.

Finally, it indicates, that most of the participants uses the IWB to make exercises and activities of jointly, with 46.7% that agree with the affirmation, and 43.3 totally agree.

Dimension 4: FUNCTIONALITIES OF THE IWB

Table 9. Descriptive study of dimension 4

Source: Own elaboration

	Frequency					%					<i>M.</i>	<i>D.T.</i>
	1	2	3	4	5	1	2	3	4	5		
To write with the pencil in the interactive slate	1	2	5	11	11	3.3	6.7	16.7	36.7	36.7	3.97	1.066
Creation of materials, contents or didactic units		4	8	9	9		13.3	26.7	30	30	3.77	1.040
To expose materials, contents, didactic units, cards...			2	7	21			6.7	23.3	70	4.63	.615
To project information from the computer				8	22				26.7	73.3	4.73	.450

Dimension 4 established that the main function of the IWB in early childhood education, is to project information of from the computer (a total of 26.7% of the participants agreed with the affirmation and a 73.3% totally agreed), although is used by a great number of educators exposing materials, contents, didactic units, cards... (23.3% of the teaching staff agrees and a 70% totally agree) (See table 9).

Nevertheless there are different opinions as far as the function of writing with the pencil in the IWB, since 36.7% of the consulted participants agree and another 36.7% totally agree agreement with this affirmation, whereas 3.3% totally disagree and 6.7% disagree. The same happens with the creation of materials, contents and didactic units, that is to say, that a 13.3% of the participants do not use the IWB for this, as opposed to a 60% that use it.

Dimension 5: FORMATION/TRAINING OF THE TEACHING STAFF TO USE THE IWB

As we can observe in table 10, 53.3% of the participant agree and 30% totally agree in regarding the easy and simple of using the IWB, as opposed to 3.3. %. In addition, 20% affirm to have received technological or computer science formation/training to use the IWB in the classroom setting as opposed to 13.3% and the 16.7% that have not received this type of formation. In the same way, 20% of the educators, agree to have received didactic formation to use the IWB in the classroom, as opposed to 30% that totally disagree, and 16.7% disagree. Finally, we see that in the question that covers changes in the teaching methodology when using the IWB, 30% and 26.7% of the teaching staff totally agree and agree respectively, as opposed to a 13.3% that totally disagree with this affirmation.

Table 10. Descriptive study of dimension 5

Source: Own elaboration

	<i>Frequency</i>					<i>%</i>					<i>M.</i>	<i>D.T.</i>
	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>		
Is easy for you to use the IWB?		1	4	16	9		3.3	13.3	53.3	30	4.10	.759
Have you received technological or computer science training?	4	5	9	6	6	13.3	16.7	30	20	20	3.17	1.315
Have you received didactic formation?	9	5	5	5	6	30	16.7	16.7	16.7	20	2.80	1.540
Do changes occur in the teaching methodology while using the IWB?	4		7	8	9	13.3		23.3	26.7	30	3.72	1.386

4.2 Inferential study

A student t-Test was made to identify independent samples (n. s. = 0.05), using as gender as a variable, we found the existence of significant differences.

Table 11. Student t-Test

		<i>Test of Levene for the equality of variances</i>		<i>t-Test for average equality</i>		
		<i>F</i>	<i>Sig.</i>	<i>t</i>	<i>gl</i>	<i>Sig. (bilateral)</i>
it increases satisfaction and self-esteem	Equal variances have been assumed	.172	.681	-.616	28	.543
	Equal variances have not been assumed			-.600	5.585	.572
it increases motivation and attention	Equal variances have been assumed	.354	.556	.128	28	.899
	Equal variances have not been assumed			.144	6.490	.890
facilitates access to resources	Equal variances have been assumed	.639	.431	.358	28	.723
	Equal variances have not been assumed			.364	5.814	.729
it facilitates content understanding	Equal variances have been assumed	.010	.921	-.562	28	.579
	Equal variances have not been assumed			-.500	5.207	.637
motivates educators	Equal variances have been assumed	5.134	.032	-1.500	27	.145

	Equal variances have not been assumed			-1.125	4.726	.314
support the educators tasks	Variances have been assumed equal	3.272	.081	.838	28	.409
	Equal variances have not been assumed			1.139	8.741	.285
student starring on its own learning	Equal variances have been assumed	1.115	.300	-1.394	28	.174
	Equal variances have not been assumed			-1.108	4.849	.320
participative student	Equal variances have been assumed	2.668	.114	.541	28	.593
	Equal variances have not been assumed			.774	9.706	.458
promotes active and collaborative work	Equal variances have been assumed	2.939	.098	1.352	28	.187
	Equal variances have not been assumed			2.231	14.265	.042
Enjoyable and dynamic class	Equal variances have been assumed	5.609	.025	1.054	28	.301
	Equal variances have not been assumed			1,549	10,345	.151
improvement in teaching	Equal variances have been assumed	.005	.942	-.322	28	.750
	Equal variances have not been assumed			-.298	5.360	.777
improvement in learning	Equal variances have been assumed	.645	.429	.243	28	.810
	Equal variances have not been assumed			.285	6.831	.784
it facilitates attention toward diversity	Equal variances have been assumed	.514	.479	.521	28	.607
	Equal variances have not been assumed			.679	8.080	.516
nicer activities	Equal variances have been assumed	15.713	.000	1.482	28	.150
	Equal variances have not been assumed			3.361	24.000	.003
collective accomplishment of activities	Equal variances have been assumed	.539	.469	.255	28	.800
	Equal variances have not been assumed			.288	6,511	.782
shade in the screen	Equal variances have been assumed	.286	.597	.000	28	1.000
	Equal variances have not been assumed			.000	6.982	1.000
lack of Internet connection	Equal variances have been assumed	8.296	.008	-1.080	28	.289
	Equal variances have not been assumed			-2.449	24.000	.022
elevated cost of the equipment	Equal variances have been assumed	.007	.933	.294	28	.771
	Equal variances have not been assumed			.297	5.783	.777
calibration	Equal variances have been assumed	.086	.771	.164	28	.871
	Equal variances have not been assumed			.152	5.360	.885
pencil or finger does not write	Equal variances have been assumed	.742	.396	.317	28	.754
	Variances have not been assumed equal			.302	5.479	.774
lack of training	Equal variances have been	.311	.582	.335	28	.740

	assumed					
	Equal variances have not been assumed			.304	5.280	.772
student distraction	Equal variances have been assumed	5.359	.028	-1.543	28	.134
	Equal variances have not been assumed			-1.103	4.604	.324
accomplishment of exercises	Equal variances have been assumed	3.873	.059	-.488	28	.630
	Equal variances have not been assumed			-.655	8,539	.529
exercises submittals	Equal variances have been assumed	.234	.632	-.659	28	.515
	Equal variances have not been assumed			-.491	4.691	.645
view of videos, web pages, etc.	Equal variances have been assumed	1.464	.236	-.405	28	.689
	Equal variances have not been assumed			-.290	4.604	.785
collective search of information	Equal variances have been assumed	.365	.551	-.055	28	.957
	Equal variances have not been assumed			-.047	5.080	.964
explanation of contents and activities	Equal variances have been assumed	5.657	.024	.828	28	.414
	Equal variances have not been assumed			.894	6.186	.405
presentation of materials and resources	Equal variances have been assumed	5.657	.024	.828	28	.414
	Equal variances have not been assumed			.894	6.186	.405
to write with the pencil	Equal variances have been assumed	.828	.371	-.377	28	.709
	Equal variances have not been assumed			-.323	5.071	.760
creation of materials, contents and didactic units	Equal variances have been assumed	.539	.469	.077	28	.939
	Equal variances have not been assumed			.065	5,009	.951
	Equal variances have been assumed	2.026	.166	.657	28	.516
	Equal variances have not been assumed			.840	7.802	.426
computer projection	Equal variances have been assumed	.639	.431	.358	28	.723
	Equal variances have not been assumed			.364	5.814	.729
it is easy to use IWB	Equal variances have been assumed	1.494	.232	-.318	28	.753
	Equal variances have not been assumed			-.213	4.484	.841
training of ICT's	Equal variances have been assumed	.476	.496	-1.057	28	.299
	Variances have not been assumed equal			-1.181	6.430	.280
didactic training	Equal variances have been assumed	2.388	.134	-.629	28	.534
	Equal variances have not been assumed			-.795	7.652	.450
Hours	Equal variances have been assumed	.486	.491	-.272	28	.787
	Equal variances have not been assumed			-.409	10.921	.690

changes in teaching methodology using the IWB	Equal variances have been assumed	.204	.655	.839	27	.409
	Equal variances have not been assumed			1.007	7.230	.347

The men totally agree that one advantages that that supposes the use of the IWB in the classroom is that activities become more attractive and enjoyable ($t=3.361$, $p=0.003$ and $\bar{x}=5$). On the other hand, the women totally disagree in regards to the lack of connection is a problem for using the IWB ($t=-2.449$, $p=0.022$ and $\bar{x}=1.20$).

4.3 Correlational analysis

In regards to Pearson's r-Test to determine the existence of correlation between the items belonging to the dimensions of the questionnaire, the results appear below in table 12. In order to interpret the results, Mateo's (2004) proposal was considered.

Dimension 1: ADVANTAGES THAT SUPPOSES THE USE OF THE IWB IN THE CLASSROOM

Table 12. Correlation Dimension 1

	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Item 8	Item 9	Item 10	Item 11	Item 12	Item 13	Item 14	Item 15
Ite 1 R	.624**	.405*	.607**	.817**	.527**	.516**	.559**	.519**	.469**	.412*	.315	.405*	.429*		.415*
Ite 1 P	.000	.027	.000	.000	.003	.004	.001	.003	.009	.024	.090	.026	.018		.023
Ite 2 R	.624**	.433*	.519**	.522**	.679**	.472**	.690**	.420*	.785**	.580**	.611**	.643**	.637**		.432*
Ite 2 P	.000	.017	.003	.004	.000	.008	.000	.021	.000	.001	.000	.000	.000		.017
Ite 3 R	.405*	.433*	.633**	.404*	.512**	.542**	.703**	.558**	.566**	.450*	.309	.482**	.659**		.276
Ite 3 P	.027	.017	.000	.030	.004	.002	.000	.001	.001	.013	.096	.007	.000		.139
Ite 4 R	.607**	.519**	.633**	.702**	.549**	.759**	.676**	.689**	.548**	.621**	.533**	.647**	.598**		.621**
Ite 4 P	.000	.003	.000	.000	.002	.000	.000	.000	.002	.000	.002	.000	.000		.000
Ite 5 R	.817**	.522**	.404*	.702**	.480**	.710**	.465*	.530**	.408*	.619**	.485**	.574**	.333		.680**
Ite 5 P	.000	.004	.030	.000	.008	.000	.011	.003	.028	.000	.008	.001	.077		.000
Ite 6 R	.527**	.679**	.512**	.549**	.480**	.698**	.636**	.594**	.593**	.603**	.564**	.724**	.738**		.398*
Ite 6 P	.003	.000	.004	.002	.008	.000	.000	.001	.001	.000	.001	.000	.000		.029
Ite 7 R	.516**	.472**	.542**	.759**	.710**	.698**	.438*	.479**	.341	.719**	.584**	.689**	.409*		.572**
Ite 7 P	.004	.008	.002	.000	.000	.000	.015	.007	.065	.000	.001	.000	.025		.001
Ite 8 R	.559**	.690**	.703**	.676**	.465*	.636**	.438*	.582**	.765**	.432*	.408*	.508**	.789**		.466**
Ite 8 P	.001	.000	.000	.000	.011	.000	.015	.001	.000	.017	.025	.004	.000		.009
Ite 9 R	.519**	.420*	.558**	.689**	.530**	.594**	.479**	.582**	.647**	.450*	.444*	.642**	.740**		.600**
Ite 9 P	.003	.021	.001	.000	.003	.001	.007	.001	.000	.012	.014	.000	.000		.000
Ite 10 R	.469**	.785**	.566**	.548**	.408*	.593**	.341	.765**	.647**	.581**	.627**	.616**	.896**		.532**
Ite 10 P	.009	.000	.001	.002	.028	.001	.065	.000	.000	.001	.000	.000	.000		.002
Ite 11 R	.412*	.580**	.450*	.621**	.619**	.603**	.719**	.432*	.450*	.581**	.905**	.767**	.518**		.673**
Ite 11 P	.024	.001	.013	.000	.000	.000	.017	.012	.001	.000	.000	.000	.003		.000
Ite 12 R	.315	.611**	.309	.533**	.485**	.564**	.584**	.408*	.444*	.627**	.905**	.787**	.541**		.636**
Ite 12 P	.090	.000	.096	.002	.008	.001	.001	.025	.014	.000	.000	.000	.002		.000
Ite 13 R	.405*	.643**	.482**	.647**	.574**	.724**	.689**	.508**	.642**	.616**	.767**	.787**	.647**		.657**
Ite 13 P	.026	.000	.007	.000	.001	.000	.000	.004	.000	.000	.000	.000	.000		.000
Ite 14 R	.429*	.637**	.659**	.598**	.333	.738**	.409*	.789**	.740**	.896**	.518**	.541**	.647**		.439*
Ite 14 P	.018	.000	.000	.000	.077	.000	.025	.000	.000	.000	.003	.002	.000		.015
Ite 15 R	.415*	.432*	.276	.621**	.680**	.398*	.572**	.466**	.600**	.532**	.673**	.636**	.657**		.439*
Ite 15 P	.023	.017	.139	.000	.000	.029	.001	.009	.000	.002	.000	.000	.000		.015

*. The correlation is significant at level 0.05 (bilateral).

**.. The correlation is significant at level 0.01 (bilateral).

The correlation, of bivariate character, between the items that integrate Dimension 1, relative to the advantages that supposes the use of the IWB in the classroom, they reflect the following remarkable results:

- The increase of the satisfaction and educational self-esteem has high relation with the increase of the motivation of the instructors ($R=0.817$ and $p=0.000$); whereas it is low with the accessibility to a great variety of resources ($R=0.405$ and $p=0.027$) and, with facilitating the attention toward diversity ($R=0.405$ and $p=0.026$). On the other hand, the relation of item 1 is moderate or remarkable for increasing motivation and the attention of the students (in

general) ($R=0.624$ and $p=0.000$), along with the facilitating of the students' understanding of the contents and subjects ($R=0.607$ and $p=0.000$), is a great support to the educational tasks ($R=0.527$ and $p=0.003$), to allow the student to be in starring roles to control their learning ($R=0.516$ and $p=0.004$), the participation and the interest in the activities on the part of the pupils ($R=0.559$ and $p=0.001$), the promotion of active and collaborative work ($R=0.519$ and $p=0.003$), the diversion and dynamism in the class ($R=0.469$ and $p=0.009$), the improvement in the educational process ($R=0.412$ and $p=0.024$), attractive and pleasing in the activities ($R=0.429$ and $p=0.018$) and, the facilitation of the collective accomplishment of activities, readings, etc. ($R=0.415$ and $p=0.023$).

- To increase the motivation and the attention of the students (in general) is related to high form of the diversion and the dynamism in the class ($R= 0.785$ and $p=0.000$). Also, item 2 is related moderately to facilitating the access to a great variety of resources ($R=0.433$ and $p=0.017$), while facilitating the learners with the understanding of the contents and subjects ($R=0.519$ and $p=0.003$), increasing the motivation of the teaching staff ($R=0.522$ and $p=0.004$), to be a great support in the educational tasks ($R=0.679$ and $p=0.000$), to allow the students control their own learning ($R=0.472$ and $p=0.008$), the participation and the interest in the activities on the part of the students ($R=0.690$ and $p=0.000$), the promotion of the active and collaborative work ($R=0.420$ and $p=0.021$), the improvement in the educational process ($R=0.580$ and $p=0.001$), the improvement in the learning process ($R=0.611$ and $p=0.000$), the facilitation in the attention toward diversity ($R=0.643$ and $p=0.000$), attractive and viscosity in the activities ($R=0.637$ and $p=0.000$) and, the facilitation of the collective accomplishment of activities, readings, etc. ($R=0.432$ and $p=0.017$).

- The understanding of the contents and subjects has a high relationship between facilitating the access to a great variety of resources to the students ($R=0.633$ and $p=0.000$), to be a great support for educational tasks ($R=0.512$ and $p=0.004$), to allow the students control their own learning ($R=0.542$ and $p=0.002$), the participation and the interest in the activities on the part of the students ($R=0,703$ and $p=0,000$), the promotion of the active and collaborative work ($R=0.558$ and $p=0.001$), the diversion and the dynamism in the class ($R=0.566$ and $p=0.001$), the improvement of the educational process ($R=0.450$ and $p=0.013$), facilitating attention toward diversity ($R=0.482$ and $p=0.007$) and, attractive and the viscosity in the activities ($R=0.659$ and $p=0.000$).

- To facilitate to the students the understanding of the contents and subjects is related in a high form to allowing the students to be protagonists or have control of their own learning ($R=0,759$ and $p=0,000$). On the other hand, item 4 is related moderately to the increase of the motivation of the teaching staff ($R=0.702$ and $p=0.000$), to be a great support to the educational task ($R=0.549$ and $p=0.002$), the participation and the interest in the activities on the part of the students ($R=0.676$ and $p=0.000$), the promotion of the active and collaborative work ($R=0.689$ and $p=0.000$), the diversion and the dynamism in the class ($R=0.548$ and $p=0.002$), the improvement in the education process ($R=0.621$ and $p=0.000$), the improvement in the learning process ($R=0,533$ and $p=0,002$), the facilitation in the attention toward diversity ($R=0.647$ and $p=0.000$), attractive and viscosity of the activities ($R=0,589$ and $p=0,000$) and, the facilitation of the collective accomplishments of activities, readings, etc. ($R=0.621$ and $p=0.000$).

- The increase of the motivation of the teaching staff is related in a high way to allowing the students to be protagonists or control their own learning ($R=0.710$ and $p=0.000$) and, low with the diversion and the dynamism in the class ($R=0.408$ and $p=0.028$). Also, the relation is moderate between item 5 with being a great support to the educational task ($R=0.480$ and $p=0.008$), the participation and the interest in the activities on the part of the students ($R=0.465$ and $p=0.011$), the promotion of the active and collaborative work ($R=0.530$ and $p=0.003$), the improvement in the education process ($R=0.619$ and $p=0,000$), the improvement in the learning process ($R=0.485$ and $p=0.008$), the facilitation in the attention toward diversity ($R=0.574$ and $p=0.001$) and the facilitation in the collective accomplishment of activities, readings, etc. ($R=0,680$ and $p=0.000$).

- A moderate relationship exists between the advantage that supposes the use of the IWB in the classroom in supporting educational tasks and to allow the students to be protagonists or control their own learning, is related of high form to the improvement of the education process ($R=0.698$ and $p=0.000$), the interest and the participation in the activities on the part of the pupils ($R=0.636$ and $p=0.000$), the promotion of the active and collaborative work ($R=0.594$ and $p=0.001$), the diversion and dynamism of the class ($R=0.593$ and $p=0.001$), the improvement in the education process ($R=0,603$ and $p=0,000$), the improvement in the process of learning ($R=0.564$ and $p=0.001$). Whereas, the relation of item 6 is high with facilitating the attention toward diversity ($R=0.724$ and $p=0.000$) and the attractiveness and viscosity of the activities ($R=0,738$ and $p=0,000$); on the other hand, the relation is low with facilitating the collective accomplishment of activities, readings, etc. ($R=0.398$ and $p=0.029$).

- To allow the students to be protagonists of their learning is related in a high form to the improvement of the process of education ($R=0.719$ and $p=0.000$) and of low way to attractive and the viscosity of the activities ($R=0.409$ and $p=0.025$). On the other hand, the relation of this item 7 is moderate with the interest and the participation in the activities on the part of the students ($R=0.438$ and $p=0.015$), the promotion of the active and collaborative work ($R=0.479$ and $p=0.007$), the improvement in the learning process ($R=0.584$ and $p=0.001$), the facilitation in the attention toward diversity ($R=0.689$ and $p=0.000$) and, the facilitation in the collective accomplishment of activities, readings, etc. ($R=0.572$ and $p=0.001$).

- The interest and the participation in the activities on the part of the students are moderate related to the promotion of the active and collaborative work ($R=0.582$ and $p=0.001$), the improvement in the education process ($R=0.432$ and $p=0.017$), the facilitation in the attention towards diversity ($R=0.508$ and $p=0.004$) and, the facilitation in the collective accomplishment of activities, readings, etc. ($R=0.466$ and $p=0.009$); on the contrary the relation is low with the improvement in the learning process ($R=0.408$ and $p=0.025$). And, this relation is high between item 8 with enjoyable and dynamism in the class ($R=0.765$ and $p=0.000$) and attractive and the viscosity in the activities ($R=0.789$ and $p=0.000$).

- A high relation exists between the promotion of an active and collaborative work and attractiveness and the viscosity of the activities ($R=0.740$ and $p=0.000$), whereas this relation be moderate between the item 9 with the diversion and dynamism in the class ($R=0.647$ and $p=0.000$), the improvement in the process of education ($R=0.450$ and $p=0.012$), the improvement in the process of learning ($R=0.444$ and $p=0.014$), the facilitation in the attention toward

diversity ($R=0,642$ and $p=0.000$) and, the facilitation in the collective accomplishment of activities, readings, etc. ($R=0.600$ and $p=0.000$).

- Diversion and dynamism in the class are moderate related to the way of improvement in the process of education ($R=0.581$ and $p=0.001$), the improvement in the learning process ($R=0.627$ and $p=0.000$), the facilitation in the attention of diversity ($R=0.616$ and $p=0.000$) and, the facilitation in the collective accomplishment of activities, readings, etc. ($R=0.532$ and $p=0.002$). Also, this item 10 is related highly to attractive and the viscosity of the activities ($R=0.896$ and $p=0.000$).

- The improvement in the education process is highly related to improving the learning process ($R=0.905$ and $p=0.000$) and facilitating the attention toward diversity ($R=0.767$ and $p=0.000$); whereas, the relation with attractiveness and viscosity of the activities is moderate ($R=0.518$ and $p=0.003$) and with the facilitation of the collective accomplishment of activities, readings, etc. ($R=0.673$ and $p=0.000$).

- To improve the learning process is highly related to the facilitation of the attention toward diversity ($R=0.787$ and $p=0.000$); similarly, the relation is moderate with attractive and the viscosity of the activities ($R=0.541$ and $p=0.002$) and, to facilitate the collective accomplishment of activities, readings, etc. ($R=0.636$ and $p=0.000$).

- A high relationship between facilitating the attention towards diversity and attractive and the viscosity of the activities exists ($R=0.647$ and $p=0.000$) and, to facilitate the collective accomplishment of activities, readings, etc. ($R=0.657$ and $p=0.000$).

- A moderate relationship exists between the attractiveness and viscosity of the activities and the facilitation of the collective accomplishment of activities, readings, etc. ($R=0.439$ and $p=0.015$).

Dimension 2: PROBLEMS WHEN USING THE IWB

Table 13. Correlation Dimension 2

Source: Own elaboration

		Item 16	Item 17	Item 18	Item 19	Item 20	Item 21	Item 22
Item 16	<i>R</i>	1	.000	-.093	-.167	.040	.000	.000
	<i>P</i>		1.000	.623	.378	.833	1.000	1.000
Item 17	<i>R</i>	.000	1	.388*	.031	-.299	-.316	.200
	<i>P</i>	1.000		.034	.871	.109	.089	.289
Item 18	<i>R</i>	-.093	.388*	1	.043	.083	.088	.111
	<i>P</i>	.623	.034		.822	.663	.645	.559
Item 19	<i>R</i>	-.167	.031	.043	1	.434*	.489**	.340
	<i>P</i>	.378	.871	.822		.016	.006	.066
Item 20	<i>R</i>	.040	-.299	.083	.434*	1	.378*	.120
	<i>P</i>	.833	.109	.663	.016		.039	.529
Item 21	<i>R</i>	.000	-.316	.088	.489**	.378*	1	.316
	<i>P</i>	1.000	.089	.645	.006	.039		.089
Item 22	<i>R</i>	.000	.200	.111	.340	.120	.316	1
	<i>P</i>	1.000	.289	.559	.066	.529	.089	

*. The correlation is significant at level 0.05 (bilateral).

**. The correlation is significant at level 0.01 (bilateral).

The correlational analysis of bivariate typology of the items of the dimension shows the following data:

- The problems in Internet connection is lowly related to the high costs of equipment maintenance ($R=0.388$ and $p=0.034$).

- The problems of calibration have an average relationship with the inactivity of the pencil (or finger) to write or ($R=0.434$ and $p=0.016$) and, with the lack of technological or didactic formation/training ($R=0.489$ and $p=0.006$).

- Also, the relative problem of the lack of appropriate writing by the pencil (or finger) relates low to the lack of technological or didactic formation/ training ($R=0.378$ and $p=0.039$).

Dimension 3: EDUCATIONAL APPLICATIONS OF THE IWB

Table 14. Correlation Dimension 3

Source: Own elaboration

		Item 23	Item 24	Item 25	Item 26	Item 27	Item 28
Item 23	<i>R</i>	1	.709**	.350	.238	.603**	.710**
	<i>P</i>		.000	.058	.206	.000	.000
Item 24	<i>R</i>	.709**	1	.681**	.252	.702**	.702**
	<i>P</i>	.000		.000	.180	.000	.000
Item 25	<i>R</i>	.350	.681**	1	.257	.673**	.673**
	<i>P</i>	.058	.000		.171	.000	.000
Item 26	<i>R</i>	.238	.252	.257	1	.392*	.296
	<i>P</i>	.206	.180	.171		.032	.112
Item 27	<i>R</i>	.603**	.702**	.673**	.392*	1	.856**
	<i>P</i>	.000	.000	.000	.032		.000
Item 28	<i>R</i>	.710**	.702**	.673**	.296	.856**	1
	<i>P</i>	.000	.000	.000	.112	.000	

*. The correlation is significant at level 0.05 (bilateral).

**. The correlation is significant at level 0.01 (bilateral).

The correlations, of the bivariate character, between the items that integrate Dimension 3 are the following:

- The accomplishment of exercises and activities of joint form is remarkable related to the correction of exercises between the IWB ($R=0.709$ and $p=0.000$) and to the explanation of activities and subjects by the professor ($R=0.603$ and $p=0.000$); whereas the relation is elevated if the professor presents/displays materials and resources ($R=0.710$ and $p=0.000$).

- Also, the correction of exercises between the IWB is related to the view of the videos, web pages and stories ($R=0.681$ and $p=0.000$), along with the explanation of activities and subjects on the part of the professor ($R=0.702$ and $p=0.000$) and when the professor presents/displays materials and resources ($R=0.702$ and $p=0.000$).

- A remarkable relationship between the view of videos, web pages and stories exists with the explanation of activities and subjects on the part of the professor and, with the presentation of materials and resources ($R=0.673$ and $p=0.000$, both).

- The joint Internet searches between the teaching staff and the students in are related of lowly related to the explanation on the part of the professor of the activities and the subjects ($R=0.392$ and $p=0.032$).

- Finally, the explanation of activities and subjects and the presentation of materials and resources by the teaching staff are related highly related ($R=0.856$ and $p=0.000$).

Dimension 4: FUNCTIONALITIES OF THE IWB

Table 15. Correlation Dimension 4

Source: Own elaboration

		Item 29	Item 30	Item 31	Item 32
Item 29	<i>R</i>	1	.677**	.454*	.484**
	<i>P</i>		.000	.012	.007
Item 30	<i>R</i>	.677**	1	.347	.231
	<i>P</i>	.000		.060	.219
Item 31	<i>R</i>	.454*	.347	1	.881**
	<i>P</i>	.012	.060		.000
Item 32	<i>R</i>	.484**	.231	.881**	1
	<i>P</i>	.007	.219	.000	

The analysis of Dimension 4 relative to the correlation of the items is explained below:

- The writing with the pencil in the interactive slate is highly related to the creation of materials, contents or didactic units ($R=0.677$ and $p=0.000$); with the exhibition of materials, contents, didactic units, cards ($R=0.454$ and $p=0.012$) and, with the projection of information from the computer ($R=0.484$ and $p=0.007$).

- On the other hand, a high relationship exists between the exhibition of materials, contents, didactic units, cards and the projection of information from the computer ($R=0.881$ and $p=0.000$).

Dimension 5: FORMATION/TRAINING OF THE TEACHING STAFF TO USE THE IWB

Table 16. Correlation Dimension 5

Source: Own elaboration

		Item 33	Item 34	Item 35	Item 36	Item 37
Item 33	<i>R</i>	1	.121	.165	.198	.142
	<i>P</i>		.524	.383	.294	.461
Item 34	<i>R</i>	.121	1	.868**	.489**	.450*
	<i>P</i>	.524		.000	.006	.014
Item 35	<i>R</i>	.165	.868**	1	.520**	.352
	<i>P</i>	.383	.000		.003	.061
Item 36	<i>R</i>	.198	.489**	.520**	1	.271
	<i>P</i>	.294	.006	.003		.155
Item 37	<i>R</i>	.142	.450*	.352	.271	1
	<i>P</i>	.461	.014	.061	.155	

Finally, the correlational analysis for Dimension 5 indicates:

- That the use of the IWB is highly related to receiving technological or computer science formation/training ($R=0.868$ and $p=0.000$); and average in regards to obtaining didactic formation ($R=0.489$ and $p=0.006$) and with the changes in the teaching methodology when using the IWB ($R=0.450$ and $p=0.014$).

- Receiving technological or computer science formation/training for the use of the IWB is notably related to receiving didactic formation/training ($R=0.520$ and $p=0.003$).

Discussion and Conclusions

In conclusion, it could be said that “a window to the world is opened from the classroom” as it affirms Marques (2006), since it allows to access through the Internet and an immediate what to a great base of knowledge and resources of all type.

Going back to our objectives, in which objective 1 (*To identify some of the possible educational applications and functionalities of the IWB in early childhood education [3-6 years]*). The professors indicated that the use of the IWB in the classroom is a valid resource that allows to develop a more more attractive and motivational learning process, like the results reached about Schmid (2008), Sad and Özhan (2012) and Korkmaz and Cakil (2013). The IWB is used to project information from the computer, to expose materials, resources, contents and didactic units, to watch videos, web pages and stories, and by all means the professor explains activities and subjects to the children. In addition, the IWB's are being used to make collaborative activities and readings since the size of the interactive screen facilitates this action.

In respect to the second objective (*To establish the value that the educators have for the IWB*). This tool, according to the opinion of 90% (re-categorizing the answer options) of the participants, it is a great support to its work as educational and its daily task and make a valuation very positive of this technology (Yang, Wang and Kao, 2012; Cao, 2015). In addition, women value the IWB more than men as a classroom resource.

With respect to objective 3 (*To know the possible advantages and improvements that supposes the use of the IWB have in the early childhood classroom for the educators and the students*) as far as the advantages that the use of the IWB in the early childhood classroom supposes, there is almost unanimity of opinions in two affirmations, being one of them that it brings accessibility to a great variety of resources to facilitates the teaching and learning process (Coyle, Yanez and Verdu, 2010; Harlow, Cowie and Heazlewood, 2010; Korkmaz and Cakil, 2013; Carkirogly, 2015), and another one, is that it allows that the propose activities become more attractive and showy, which provokes an increase in the motivation and in the class attention of the students for a better understanding of the explanation/discussion, as well as a greater interest to participate (Tertemiz, Sahin, Dog and Duzgun 2015).

In regards to objective 4 (*To identify the main problems or disadvantages that the use of the IWB brings to early childhood education*), we agreed with Digregorio and Sobel-Lojeski (2010), Alonso and Martin (2011), Prats, Laughed, Gandol, Cheek (2011), Sad and Özhan (2013) Cakirogly (2015), in that a liability within the use has to do with the lack of formation/training toward the instructors. Other problems included bad connection to the Internet, or problems with calibration, along with the distraction of the students and a shade in the screen that obstruct the correct display. This generated certain reluctance for it's use in early childhood. (Cao, 2015; Tertemiz, Sahin, ET to. 2015).

In regards to the last two objectives, fifth and sixth, (*To verify if the integration of the IWB changes the teaching methodology* and *To detect if the teaching staff receives the sufficient formation/training for the use of IWB in the classroom*), just like in previous research (Cao, 2015; Tertemiz, Sahin, et al., 2015) the instructors considered that is easy to work with the IWB, which demonstrates there, willingness to use it and to move forward as part of the teaching and learning process, despite not receiving proper training for it (Balta and Duran, 2015).

In conclusion we can say that IWB is an excellent tool in order to obtain very positive results, and an optimization in the teaching and learning process.

Disclosure statement

The Authors reported that no competing financial interest.

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