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Article

The educational space as a facilitating element of gamification in the classroom

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Abstract: Gamification is an active methodology of great value that, in a quality educational environment, provides students with the necessary motivation to participate in their teaching-learning process. An emerging active methodology, which is based on the use of information and communication technologies (ICT) and requires an educational space that guarantees greater flexibility in the pedagogical dynamics in favor of academic achievement. This increase in interest in active methodologies, and specifically in gamification, has raised doubts about whether current educational spaces are prepared to host a renewal in methodology or if, on the contrary, they could undermine the attitude of change. For this reason, this research seeks to analyze whether current educational spaces are facilitating elements for the incorporation of gamification in the classroom. The methodological cut of the research is quantitative, specifically in two phases. On the one hand, a descriptive analysis of the results is carried out, obtaining information on the trend of each item. On the other hand, an inferential analysis is carried out around different variables to verify their possible influence on the evaluations of the participants. The results obtained, in the sample made up of 210 teachers distributed in the different centers and who carry out their educational activity from 3rd to 6th grade of primary school, indicate that teachers believe it is relevant to take into account the educational space when incorporating active methodologies in class.

Keywords: academic achievement; teaching-learning; educational space; gamification teachers; active methodologies; technology

1. Introduction

Architecture's purpose is to reconcile the materiality of spaces with human habitation. There is great interest, according to the literature consulted, in studying the design of current educational spaces, assessing the possibilities they offer for the benefit of the pedagogical project and, if necessary, in the future; establish guidelines to carry out the transformation of existing ones and adapt them to current needs. A research task that has been arousing the interest of experts in different fields of study for years.

Thus, as Laorden and Pérez (2002, p. 133) state: "For decades, the study of school space and classroom organization has interested many professionals: pedagogues, psychologists, architects, teachers ... however, research is scarce and we find it in educational centers few practical applications".

This research work, carried out in all Primary Education Centers of the Autonomous City of Ceuta (Spain), seeks to provide answers to a large sample of teachers consulted. To this end, a previously designed and validated questionnaire was

carried out, which offered answers about the different perceptions of the teachers surveyed in relation to the educational space in which they teach. An investigation, whose main objective is to know if current educational spaces are facilitating elements for the incorporation of gamification in classrooms.

A research work that reveals the importance that teachers give to their work-classroom space; finding significant aspects in different groups of teachers surveyed. An educational space that must be constantly renewed to accompany a precise methodological renewal of diverse scenarios, of classrooms whose spatial organization and material resources facilitate the teacher's work; transforming the traditional school into an educational space that allows strengthening new learning models in favor of students.

2. Literature review

Existing educational spaces should provide students with an environment conducive to fostering human relationships, cultivating a positive work atmosphere, and actively involving the educational community. By doing so, they can contribute to enhancing academic achievement. An educational space that champions the adoption of an innovative methodology within classrooms, facilitating the incorporation of active methodologies that empower students to become the protagonists of their educational journey (Lira Valdivia, 2010; Parra-González et al., 2020).

The study of educational spaces in schools, the impacts of this on the teaching-learning process (Laorden and Pérez, 2002) and the integration of active learning classrooms, has garnered significant attention among researchers across various scientific disciplines.

Just as architecture has evolved to cater to the needs of its inhabitants, educational spaces must be meticulously designed as essential tools for learning. These spaces should empower teachers to cultivate environments that encourage student engagement and facilitate the integration of methodologies that pique their interest, thereby enabling students to actively shape their own learning experiences (Parra-González et al., 2020). An educational space that serves as a facilitating element of the teaching-learning process, as suggested by Laorden and Pérez (2002), thus creating a stimulating learning environment.

To address issues regarding educational spaces, studies have been undertaken to gather the perspectives of both teachers and students regarding the design of these spaces. Alonso-Sanz (2017) concluded that students expressed discomfort with their school spaces and emphasized the need for elements that could enhance their comfort within these spaces. Hence, it is crucial to underscore how educational spaces can either foster human relations and facilitate activities, as discussed by Romaña (2004), or hinder the teaching-learning process if students and teachers do not feel comfortable within those spaces.

The bibliography underscores the significance of conceptualizing educational spaces as facilitating elements of the teaching-learning process. However, it is essential to avoid solely superficial or aesthetic renovations; instead, any changes must be accompanied by a transformation in educational practices. This involves

transforming the classroom, moving away from rigid educational methods (Duarte, 2003), and towards the creation of an environment that fosters student motivation and commitment (Luelmo del Castillo, 2018), within their teaching-learning process.

Thus, to address one of the prevalent challenges in teaching practice, namely the lack of student motivation (Rodríguez-Pérez, 2002), there is a growing emphasis on integrating active methodologies in classrooms. This approach serves as a powerful tool to stimulate student engagement and encourage them to take a more active role in their teaching-learning process (López-Belmonte et al., 2020). Active methodologies which, when implemented in educational spaces that facilitate greater flexibility in teaching dynamics and promote new group and spatial organizations (Fombella, 2019), will enhance academic achievement among students and foster their responsibility with the teaching-learning process (Luelmo del Castillo, 2018).

Gamification has become increasingly prominent in classrooms today. This active methodology is immensely valuable, particularly as it relates to the integration of Information and Communication Technologies (ICT), which also highlights the need for skilled teachers for the implementation of the same (Fuentes et al., 2020). An important tool that is based on the use of game elements, designs or structures in non-game contexts (Deterding et al., 2011; González et al., 2016; Hanus and Fox, 2015; Kapp, 2012b; Koivisto and Hamari, 2014; Powers et al., 2013; Whitton and Moseley, 2010; Parra-González et al., 2019).

Gamification is a methodology that is gaining traction in the educational sphere, based on the use of game structures, designs, or dynamics within the formal school environment, with the aim of enhancing student motivation (Parra-González y Segura-Robles, 2019). The integration of gamification in classrooms will facilitate the cultivation of social skills required to support the effective execution of group activities (Perotta et al., 2013; López-Belmonte et al., 2020). This necessitates an educational space characterized by flexibility to accommodate the proposed dynamics.

As previously mentioned, gamification involves the integration and significant transformation of ICT aspects within classrooms. Moreover, it presents a considerable challenge in terms of adapting and transforming existing physical spaces. Hence, it is compelling to illustrate the dynamics of the Escape Room as one of the most prominent examples of gamification introduced into classroom learning. An active methodology that centers around the classroom or hall as the primary learning environment, requiring adaptation to accommodate the proposed dynamics. It provides the opportunity for transformation into a cooperative workspace where students engage with dedication and motivation to achieve learning objectives (López-Belmonte et al., 2020). The transformation of daily work in classrooms, which will require classrooms to be equipped with an aesthetic component associated with game-based mechanics (Kapp, 2012a; Pérez-López et al., 2017). This approach aims to cultivate an environment conducive to the teaching dynamics being implemented, one that does not impede teaching activities but rather enhances them.

Hence, implementing strategies to facilitate the transformation of existing educational spaces in support of active methodologies would promote the creation of environments conducive to collaboration within the educational community. These spaces would be tailored to support development based on active methodologies (Park and Choi, 2014), thereby easing the implementation of classroom dynamics which,

like gamification, enable students to achieve significant and enhanced learning outcomes (De-Marcos et al., 2014; Gee, 2007).

Therefore, we could conclude, as advocated by Ander Egg (1999), that active methodologies, including gamification, operate under the premise that learning has the capacity to unlock our latent potential. Hence, it becomes crucial to endorse a methodological transformation that revitalizes the teaching approach, aligning with evolving student needs and advocating for a school environment that nurtures students' personal development (Bruner, 2009).

3. Materials and methods

In this work, a quantitative investigation has been carried out in which the link between theory, research and reality will be based on the concurrence between the researcher`s perception of the reality raised in a hypothesis and reality as a phenomenon for a theory be ratified (Del Canto and Silva, 2013).

The study presented here has been conducted by means of quantitative research divided into two phases. Firstly, an initial descriptive analysis was performed, in order to know the response trends of the variables analyzed. Secondly, an inferential analysis was performed to achieve more precise responses to the previously established objectives by deriving specific generalizations about the population from the participant sample.

The overall objective of this research seeks to analyze whether current educational spaces are facilitating elements for the incorporation of gamification in the classroom. Furthermore, based on this overall objective, the following specific objectives are integrated:

- To analyze the characteristics of the classroom and explore its potential as a supportive element in the teaching-learning process.
- To assess the readiness of teachers for methodological innovation and their level of training in active methodologies.
- To examine whether gamification or game-based learning requires an adapted educational environment.

3.1. Sample

The research was conducted in various Early Childhood and Primary Education Centers in the Autonomous City of Ceuta. All of the Early Childhood and Primary Education Centers in the City, 17 of which are public schools and 6 state-funded private schools, were invited to participate in the research, with 16 public schools and 4 state-funded private schools agreeing to take part in the study presented herein.

In order to conduct the research, the sample was selected by clustered random sampling. This is a sampling technique where, as described by Buendía et al. (1998), the sample unit consists of groups. The research presented here, is made up of a sample of 210 teachers, distributed throughout various schools, and who teach primary school children from 3rd to 6th grade.

The teachers participating in the survey are distributed across public schools and state-funded private schools; 80.5% of the teachers work in public schools and 19.5% in state-funded private schools. Furthermore, in terms of the distribution by gender,

the sample is made up of 69.5% women and 30.5% men.

The employment status of the teachers interviewed reflects that 23.3% are temporary teachers, 54.8% are civil servants and 21.9% are labor personnel. Furthermore, the teachers interviewed have been classified in different age brackets, which may provide relevant information when subsequently reading and analyzing the results. Therefore, of the total number of teachers interviewed, 4.8% are under the age of 30 years, 23.8% range between 30–39 years, and 35.7% between 40–49 years and, lastly, 35.7% are over the age of 50 years.

In addition, information regarding teachers' work experience has been extracted, which shows how 16.2% have less than 5 years' experience, 14.3% between 5 and 10 years, 25.7% between 11 and 20 years, 31.9% between 21 and 30 years and, lastly, 11.9% have over 30 years of teaching experience (**Table 1**).

Lastly, it is important to note that, the demographic information collected in the questionnaires, have collected data about the different areas of specialization of the teachers. Hence, out of the 210 teachers interviewed, 133 specialize in primary education, with 122 of them serving as tutors. Furthermore, apart from the primary education specialty, in the participant survey there is a percentage of teachers from other areas of specialization including English (12.4%). music (3.8%). religion (2.4%) physical education (11.4%) special needs education (12.4%) and hearing and speech (4.8%).

Table 1. Sample descriptive statistics and variables collected.

		N	**%**
Gender	Male	64	30.5%
	Female	146	69.5%
Age	<30 years	10	4.8%
	30–39 years	50	23.8%
	40–49 years	75	35.7%
	>50 years	75	35.7%
Work experience	Less than 5 years	34	16.2%
	5–10 years	30	14.3%
	11–20 years	54	25.7%
	21–30 years	67	31.9%
	More than 30 years	25	11.9%
Employment status	Temporary teacher	49	23.3%
	Civil servant	115	54.8%
	Labor personnel	46	21.9%
Type of school	Public school	169	80.5%
	State-funded private school	41	19.5%
Tutor	No	88	41.9%
	Yes	122	58.1%

3.2. Instrument for collecting data

Data was collected through a questionnaire specifically designed and validated

by experts in the field of education and active methodologies. The questionnaire consists of various dimensions and includes a total of 26 items. It is currently undergoing the publication process. The design of the instrument has been carried out in the following stages:

- The original questionnaire is made up of 30 items and is divided into 4 dimensions.
- The content validity is evaluated by a group of experts in the field of education. The experts responded individually to a questionnaire with closed questions to evaluate the adequacy and relevance of the instrument; by using a Likert scale from 1 to 5. In addition, the experts also had the possibility of offering observations, on each of the items, in an open question. After carrying out the expert review, the questionnaire is made up of 26 items and divided into 3 dimensions.

To fulfill the objectives of this research, we will analyze 5 items directly related to the dimension of educational space. The response options in the questionnaire are Likert scale responses; where 1 is the most negative value and 5 the most positive. In this case, the analyses will concentrate on the dimension of educational space, which is directly linked to the objective of this research.

- I1: The classroom design facilitates the incorporation of active methodologies.
- I2: In order to use active methodologies in the classroom, you believe ICT need to be incorporated.
- I3: You consider the physical space when planning classroom activities.
- I4: The classroom design fosters the use of active methodologies.
- I5: Students engage more in class when dynamic teaching methods are implemented.

In this case, after analyzing the level of reliability using Cronbach's alpha, a value of 0.785 is obtained, indicating that the instrument is considered acceptable (Cervantes, 2005).

Procedure and analysis:

The research work presented here has been conducted in various stages. The questionnaires that are designed are printed and personally delivered to the management teams at the various schools, which enables the objective of the study to be explained and the text to be read in order to resolve any potential queries. After a certain period of time, the questionnaires handed out are collected. Once classified and when the valid sample has been selected, the results are entered into the statistical analysis program SPSS.

Table 2. Normality test for the items used (Kolmogorov-Smirnov).

	Statistical	**Gl**	***P***
I1	0.178	210	<0.001
I2	0.224	210	<0.001
I3	0.223	210	<0.001
I4	0.199	210	<0.001
I5	0.241	210	<0.001

A preliminary analysis of the selected items is conducted, to establish the central trend of the responses (median), variability (standard deviation) and peak (kurtosis). **Table 2** enables the analysis of the distribution of the data obtained through the Kolmogorov-Smirnov test; which is used since it is a sample with a higher $N > 50$ value (Pedrosa et al., 2015) and observing that the distribution of data is not normal ($p < 0.05$).

4. Results and discussion

Below are the results obtained corresponding to the 5 variables analyzed in this research paper. **Table 3** illustrates the descriptive statistics for each of the selected items. Therefore, item 5 ("Students engage more in class when dynamic teaching methods are implemented") is the one that obtained the highest median (4.09), while item 1 ("The classroom design facilitates the incorporation of active methodologies") is the one that obtained the lowest median (3.42). The maximum typical deviation, is item 1, with a value of 1.105.

The distribution measurements, illustrated in **Table 3**, allows us to recognize the way in which the values are separated or grouped together. Hence, we observe that all asymmetry values are negative, indicating that the majority of values are clustered beneath the median. The maximum and minimum scores, corresponding to the 5 items, are between values 1 and 5, entailing a review of the study database.

Table 3. Descriptive statistics for the variables analyzed.

	I1	**I2**	**I3**	**I4**	**I5**
N	210	210	210	210	210
Range	4	4	4	4	4
Minimum	1	1	1	1	1
Maximum	5	5	5	5	5
Median	3.42	3.93	3.97	3.51	4.09
Devi.	1.105	1.007	0.995	1.041	0.911
Variance	1.221	1.014	0.989	1.084	0.829
Asymmetry	−0.299	−0.736	−0.787	−0.437	−0.718
Kurtosis	−0.480	−0.026	0.117	−0.134	−0.185

The items are then analyzed individually to ascertain the results obtained for each descriptor. To make it easier to read the data, a numerical value will be assigned in the assessment scale (Likert) taking into account that: 1 = strongly disagree; 2 = disagree, 3 = agree; 4 = somewhat agree; 5 = strongly agree.

Table 4 contains the results for descriptor "I1: The classroom design facilitates the incorporation of active methodologies." There is a greater concentration of responses around levels 3 and 4 with 34.8% and 28.1%, respectively; in contrast with 1, which is the one that obtained the lowest percentage of responses (5.7%).

Table 4. Descriptive statistics for item 1.

	Frequency	Percentage	Valid %
Strongly disagree	12	5.7	5.7
Disagree	26	12.4	12.4
Agree	73	34.8	34.8
Somewhat agree	59	28.1	28.1
Strongly agree	40	19.0	19.0

For descriptor "I2: In order to use active methodologies in the classroom, you believe ICT need to be incorporated", the majority of the responses are grouped around values 4 and 5 (**Table 5**). With 1, as with the previous descriptor, being the one that obtains the lowest percentage of responses (1.9%).

Table 5. Descriptive statistics for item 2.

	Frequency	Percentage	Valid %
Strongly disagree	4	1.9	1.9
Disagree	15	7.1	7.1
Agree	45	21.4	21.4
Somewhat agree	74	35.2	35.2
Strongly agree	72	34.3	34.3

For descriptor "I3: You consider the physical space when planning classroom activities" (**Table 6**), as with the previous descriptor, most of the responses are grouped around the values 4 and 5; with 35.2% and 35.7%, respectively. While 1 is the value that obtains the lowest percentage of responses (1.9%).

Table 6. Descriptive statistics for item 3.

	Frequency	Percentage	Valid %
Strongly disagree	4	1.9	1.9
Disagree	13	6.2	6.2
Agree	44	21.0	21.0
Somewhat agree	74	35.2	35.2
Strongly agree	75	35.7	35.7

Table 7. Descriptive statistics for item 4.

	Frequency	Percentage	Valid %
Strongly disagree	10	4.8	4.8
Disagree	19	9.0	9.0
Agree	72	34.3	34.3
Somewhat agree	71	33.8	33.8
Strongly agree	38	18.1	18.1

For descriptor "I4: The classroom design fosters the use of active methodologies" (**Table 7**), most of the responses are grouped around values 3 and 4, with 34.3% and

38.8%, respectively. As in the previous descriptor, 1 is the value that obtains the lowest percentage of responses (4.8%).

For descriptor "I5: Students engage more in class when dynamic teaching methods are implemented", (**Table 8**) there is an extremely relevant grouping of responses between values 4 and 5, with the percentage of 34.8% and 40%, respectively. While 1 is the value that obtains the lowest percentage of responses (0.5%).

Table 8. Descriptive statistics for item 5.

	Frequency	**Percentage**	**Valid %**
Strongly disagree	1	0.5	0.5
Disagree	10	4.8	4.8
Agree	42	20.0	20.0
Somewhat agree	73	34.8	34.8
Strongly agree	84	40.0	40.0

Inferential analyses

Having performed the descriptive analysis, various inferential analyses are performed, with the aim of establishing more precise generalizations of the population with the sample obtained in the study and their different sociodemographic variables.

Table 9. Difference in item values based on type of school.

	Type of School	***N***	**Average range**	**Sum of ranges**
I1	Public school	169	104.52	17,663.50
	State-funded private school	41	109.55	4491.50
I2	Public school	169	108.75	18,378.50
	State-funded private school	41	92.11	3776.50
I3	Public school	169	110.39	18,656.50
	State-funded private school	41	85.33	3498.50
I4	Public school	169	101.96	17,230.50
	State-funded private school	41	120.11	4924.50
I5	Public school	169	102.66	17,349.50
	State-funded private school	41	117.21	4805.50

	I1	**I2**	**I3**	**I4**	**I5**
Mann-Whitney U test	3298.500	2915.500	2637.500	2865.500	2984.500
Wilcoxon test	17,663.500	3776.500	3498.500	17,230.500	17,349.5
Z	−0.494	−1.653	−2.496	−1.795	−1.461
Sig.	0.621	0.098	0.013	0.073	0.144

a. Grouping variable: Type of school.

In terms of the type of school (**Table 9**), which may be public schools or state-funded private schools, the results do not show significant differences for any of the items I1 ($p = 0.621$), I2 ($p = 0.098$), I4 ($p = 0.073$) and I5 ($p = 0.144$), indicating that the type of school does not appear to be a differentiating variable in terms of the

responses for these three items. However, this is not the case with item 3, where there is a significant difference ($p = 0.013$); where, in both cases, the highest response values are for teachers who teach in state-funded private schools.

Inferential tests for the age variable are also performed, which has been represented in two blocks (**Table 10**) for ease of data interpretation. On the one hand, teachers under the age of 39 years have been grouped together and, on the other, those over the age of 40 years. The results do not show significant differences with respect to this variable in items 1 ($p = 0.054$), Item 3 ($p = 0.279$) and Item 4 ($p = 0.018$). On the other hand, items 2 and 5 do show significant differences in terms of age with $p = 0.006$ and $p = 0.018$, respectively. In terms of I2, the highest values are obtained by those over the age of 40 and in I5 those under the age of 39.

Table 10. Difference in item values based on age and test statistics.

	Age	***N***	**Average range**	**Sum of ranges**
I1	≤39	60	117.78	7066.50
	≥40	150	100.59	15,088.50
I2	≤39	60	88.30	5298.00
	≥40	150	112.38	16,857.00
I3	≤39	60	112.31	6738.50
	≥40	150	102.78	15,416.50
I4	≤39	60	111.84	6710.50
	≥40	150	102.96	15,444.50
I5	≤39	60	120.28	7216.50
	≥40	150	99.59	14,938.50

	I1	**I2**	**I3**	**I4**	**I5**
Mann-Whitney U test	3763.500	3468.000	4091.500	4119.500	3613.5
Wilcoxon test	15,088.500	5298.000	15,416.500	15,444.500	14,938.5
Z	−1.923	−2.726	−1.082	−1.000	−2.368
Sig.	0.054	0.006	0.279	0.317	0.018

a. Grouping variable: Age.

Alternatively, inferential tests have been carried out for the variable of teaching experience, which has been divided into two groups. (**Table 11**), on the one hand, those who have been teaching for 10 years or less, and for those who have been teaching for more than 10 years. The results do not show significant differences with respect to this variable in Items 1 ($p = 0.519$), Item 3 ($p = 0.712$), Item 4 ($p = 0.785$), and Item 5 ($p = 0.163$). However, differences can be seen in terms of the time worked by the participants in item 2 ($p = 0.022$), with those who have been teaching for more than 10 years being the ones who obtain the highest values in their responses.

Table 11. Difference in item values based on experience and test statistics.

	Experience	*N*	Average range	Sum of ranges
I1	≤10 years	64	109.43	7003.50
	>10 years	146	103.78	15,151.50
I2	≤10 years	64	91.73	5870.50
	>10 years	146	111.54	16,284.50
I3	≤10 years	64	103.28	661,000
	>10 years	146	106.47	15,545.00
I4	≤10 years	64	103.85	6646.50
	>10 years	146	106.22	15,508.50
I5	≤10 years	64	113.81	7284.00
	>0 years	146	101.86	14,871.00

	I1	I2	I3	I4	I5
Mann-Whitney U test	4420.500	3790.500	4530.000	4566.500	4140.000
Wilcoxon test	15,151.500	5870.500	6610.000	6646.500	14,871.000
Z	−0.644	−2.285	−0.369	−0.272	−1.394
Sig.	0.519	0.022	0.712	0.785	0.163

a. Grouping variable: Experience.

To visualize this significance, in **Figure 1**, responses are grouped around high values. However, the sample with teaching experience exceeding 10 years exhibits a stronger inclination towards higher values, and this difference is statistically significant.

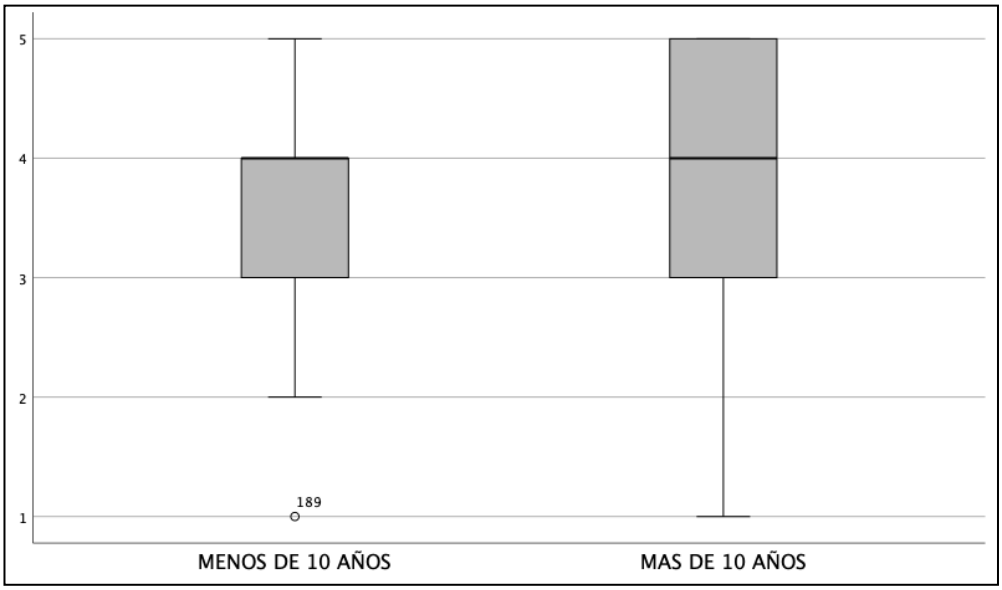

Figure 1. Boxplot of responses grouped by teaching experience I2.

Finally, from another analytical perspective, inferential tests were conducted, grouping participants according to their areas of specialization. It is in the specialty of physical education (**Table 12**) where significant differences can be observed with respect to this variable, specifically in Item 3 (p = 0.007). However, significant

differences are not observed in Items 1 ($p = 0.186$), 2 ($p = 0.137$), 4 ($p = 0.092$), and 5 ($p = 0.132$) with respect to this variable.

Table 12. Difference in the values of the items of teachers who do or do not teach physical education.

	Physical Education	***N***	**Average range**	**Sum of ranges**
I1	No	186	103.58	19,266.00
	Yes	24	120.38	2889.00
I2	No	186	107.63	20,019.00
	Yes	24	89.00	2136.00
I3	No	186	101.65	18,907.50
	Yes	24	135.31	3247.50
I4	No	186	103.08	19,172.00
	Yes	24	124.29	2983.00
I5	No	186	103.36	19,225.50
	Yes	24	122.06	2929.50

	I1	**I2**	**I3**	**I4**	**I5**
Mann-Whitney U test	1875.000	1836.000	1516.500	1781.000	1834.500
Wilcoxon test	19,266.000	2136.000	18,907.500	19,172.000	19,225.500
Z	−1.324	−1.485	−2.690	−1.684	−1.507
Sig.	0.186	0.137	0.007	0.092	0.132

a. Grouping variable: Physical Education Instruction.

5. Discussion and conclusions

The results obtained from the research, as presented in the preceding section, provide intriguing insights for analysis in terms of improving teaching quality. The educational community should consider studies of this nature and their outcomes in order to enhance educational practices and the teaching-learning process. After all, teachers should strive to innovate teaching methods to cater to the evolving needs of today's students and promote the establishment of a revitalized educational environment. This environment should encourage collaborative work between students and teachers, while also being conducive to the implementation of active methodologies (Park and Choi, 2014).

In general terms, the teachers interviewed have responded with values between 3 and 4 regarding the design of classrooms facilitating the incorporation of active methodologies. This affirmation holds significant weight because if the educational space does not permit the execution of certain activities, promote coexistence, and facilitate flexibility of movement within the classroom (Romaña, 2004), it could undermine the process of methodological renovation and the incorporation of active methodologies in classrooms.

Furthermore, teachers have indicated with values between 4 and 5 that the incorporation of ICT is necessary in order to implement active methodologies in the classroom. The use of Information and Communication Technologies that will require prior training of teachers to equip them for immersing students in an active and high-

quality learning experience (Canaleta et al., 2014).

It is also significant to note that teachers interviewed with over 10 years of teaching experience and aged over 40, perceive a heightened necessity for the integration of ICT in order to incorporate active methodologies in classrooms. This issue underscores the persistent digital divide between teachers and the use of new technologies (Mur, 2016), prompting the question of whether older teachers perceive the need for ICT in classrooms for the implementation of active methodologies as a positive or negative element.

As in the preceding variable, the teachers interviewed tend to respond with values between 4 and 5 to the issue regarding "considering space when planning activities". As outlined in the theoretical framework of reference, if the educational space has been designed with the requirements of the teaching process in mind (Fisher, 2005), it becomes a facilitating tool of the teaching-learning process. It is also noteworthy to highlight that physical education teachers tend to provide higher responses to this issue, indicating that they place greater importance on the educational space in their planning activities. This underscores their longstanding concern for methodological innovation and the incorporation of new learning styles (Zapatero et al., 2018).

Finally, a significant percentage of teachers awarded scores between 4 and 5, indicating that students are more engaged in class when dynamic teaching methods are used. It is crucial to emphasize the significance of incorporating active methodologies in classrooms, such as gamification, as they foster a positive attitude towards learning and contribute to academic achievement. Active methodologies, as highlighted by Pérez-López et al. (2017) and López-Belmonte et al. (2020), require a high-quality educational environment for their successful implementation.

In this sense, it is important to highlight how the questions raised in this research are answered by the agents surveyed. A complete questionnaire, which covers aspects related to active methodologies, the educational space, classroom design and the incorporation of ICT. The teachers surveyed thus reaffirm that the design of educational spaces is essential in the pedagogical dynamics carried out, that active methodologies require the use of ICTs and that promoting innovative methods, such as gamification, promote a more active attitude of the students; thus, improving educational quality. Therefore, it is important when programming activities to consider the space that the teacher has available and, if necessary, take measures to transform educational spaces that may be deficient into scenarios that allow the organization of time and space (Balongo and Mérida, 2016) facilitating the versatility of the pedagogical dynamic.

6. Challenges and limitations

It is important to take into account the challenges that the authors of this work have encountered during its completion, since some of the conclusions drawn can contribute to the completion of work on related subjects. Therefore, it is important to highlight as a future challenge, knowing the perception of the educational space in which the students of the different educational centers are trained. Thus, if the students, as a very important member of the educational community, feel that they are part of the process of improving their educational space; they will be able to understand that

the actions they carry out can influence the environment around them and transform it (Walden, 2015).

On the other hand, in terms of limitations, even though we are in a very heterogeneous and culturally diverse city such as the Autonomous City of Ceuta (Spain), it would be interesting and of great value to offer more answers to the research topic; expand the sample and contrast it in other parts of Spanish geography.

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