ISSN: 2669-2325 (Online)

International Journal of Childhood Education • Vol. 4 • Issue 1 Open Access

The Importance of the Educational Space for the Use of Active Methodologies

Marta M. Poyato-Núñez*, and M. Elena Parra-González

University of Granada, Spain
* **Corresponding Author E-mail Address:** mmpoyato@gmail.com

Citation: Poyato-Núñez, M. M., & Parra-González, M. E. (2023). The Importance of the Educational Space for the Use of Active Methodologies. *International Journal of Childhood Education, 4*(1), 1-11. https://doi.org/10.33422/ijce.v4i1.338

ABSTRACT

Educational centres aim to offer students quality educational facilities which promote social relations, cooperative work and participation; this way, the incorporation of a methodological renovation within the classrooms on behalf of academic progress will be promoted. The design of today's learning spaces must offer educators the opportunity of carrying out a renewed methodology enhancing the educational project; making it possible that learners have a say in their own educational-learning process. These spaces must facilitate the teaching work in the interest of the students.

This research paper which took place in Ceuta (Spain) intends to find out whether particular spatial conditions exist so that educational centres are actually stimulating elements within the process or not. An investigation in which we are interested in analysing if current infrastructures, human resources and materials are interfering the methodological renewal and letting the design of these spaces be elements of significant impact in the academic achievement. Being aware of the educational community's perception about the adequacy of resources, air quality in the classrooms, appropriateness of both lighting and infrastructures will be some of the aspects to which we will try to shed light on. With the data obtained we conclude the following: on the one hand, characteristics and infrastructures of educational centres positively contribute in the teaching-learning process and, on the other hand, the deficiencies found out within the analysed educational spaces clearly interfere methodological renewal and active methodologies in the classroom.

keywords: academic achievement, design, education, educational space, active methodologies

1. Introduction

Present-day educational centres must provide students with educational surroundings that foster social relations, a good working environment and the participation of the educational community with the goal of promoting academic achievement; educational facilities that will provide teachers with the resources to implement new approaches adapted to achieve the goals and perform the activities that will transform students into active players in their own educational process.

1.1. Architecture and social relations

The link between architecture and social relations has been known and studied by anthropologists, architects and sociologists for many years. This research has clearly demonstrated the importance of the architectural space as a fundamental component of human relations in the societies that experience it.

In the 20th century Bourdieu (1999) already understood the nature of this space in both its physical and social dimensions. Consequently, it is no longer possible to think of architecture as something foreign to the person who experiences it, that the design of spaces will not be the cause or effect of the historical and social time in which it exists.

Nevertheless, the idea of architecture designed "by and for people" is a concept that would not be articulated until the 20th century. Architectural theory in earlier times understood the discipline as an art in which form prevailed over function; architecture had no business responding to the newly-discovered needs of society to respond to the newly-emerging ways of inhabiting the cities.

Thus, in the 20th century a new school of architects began to propose new premises that would lay the foundations for modern architecture. Led by Le Corbusier, they articulated a new vision of architecture in which "form follows function" and the idea that "everything that functions well, looks well" became the war cry of an architectural trend that sought to adapt buildings to social needs and newly-prevailing lifestyles.

1.2. The design of educational spaces. towards enhancement of the academic achievement by the architectural function

The architecture of educational spaces is an important field of investigation for researchers who study the numerous repercussions of the design of places where the teaching and learning process takes place. As Laorden and Pérez state (2002) along the same lines, research on educational spaces is a subject of great interest for researchers from various scientific branches, although few of their findings have been applied to actual schools.

Thus, as noted above, buildings must be designed to respond to the needs of human beings who live and work in them; they must foster inhabitation of the space for the purpose for which it was designed. For this reason, the architecture of educational spaces must always be a factor that facilitates learning, providing the teacher with the option of setting up favourable relationships that encourage the involvement of students and, ultimately, enhanced academic achievement. The goal is to design an educational space that facilitates learning and therefore – as Laorden and Pérez (2002) propose – a comfortable educational environment that fosters both the teachers' and the students' tasks.

Nevertheless, over time, the educational space as an architectural element has remain unchanged and has not been considered a resource to support teaching. Teachers have not included it within their pedagogical dynamics, have not adapted it to educational practice and they have not changed those elements that are part of the classroom, losing an important resource to support the teaching-learning process.

Educational spaces that luckily, for several decades now, have been considered a key factor in the development of educational practice. A more flexible vision of the architecture of current educational spaces (Fombella, 2020) that intends to leave behind a rigid system of classroom organisation according to the new pedagogical dynamics. An educational space valued from different pedagogical models (Fombella, 2020) as a key component in the teaching-learning process.

With this, the idea of the importance of architecture in the field of education, and consequently of its repercussions on academic performance, is made sufficiently clear. In view of these premises, it is crucial to take the thermal conditions, the acoustic quality and the age of the school building into account (Earthman, 2002) when proposing refurbishment of educational spaces in order to achieve that comfortable educational space for the entire academic community.

In this sense, it is important to highlight how the design of educational spaces has been studied for a while by teachers and students who seek responses about the important relationship between space and the teaching dynamics carried out inside it. An architectural space that should promote the personal relationships that are built inside it, foster collective identity and enable the performance of movements and tasks (Romaña, 2004).

It is also important to remember that the design of educational spaces must not be merely aesthetic (Laorden and Pérez, 2002) but understood as a tool to foster learning and benefit the educational method that is being applied. This affirmation underlines the evidence of how the design of the educational space and the organisation of the classroom are directly connected to the method they host; space is thus understood as a component that advances or constrains the teaching-learning process.

1.3. Active methods and academic achievement

A review of the literature clearly shows the need to think of educational spaces as fundamental tools in the teaching-learning process. For this reason, a renewal of the methodology is urgently needed to adapt the design of the surroundings and the activities to the current demands of society in order to foster conceptualisation of learning and the students' motivation. The educational spaces and methods must – as Balongo and Mérida (2016) point out – encourage the development of new ways of occupying space through activities and groupings.

The teaching team will aim to implement innovative strategies to achieve the learning goals (López-Belmonte *et al.*, 2020), adapting their approach to a new role in the classroom. The students, by becoming active agents in their own educational process, will have to take part in the assessment process by learning to assess their own work and that of their peers (Luelmo del Castillo, 2018) and thus consolidate their participation in the teaching-learning process and foster improvements for the future.

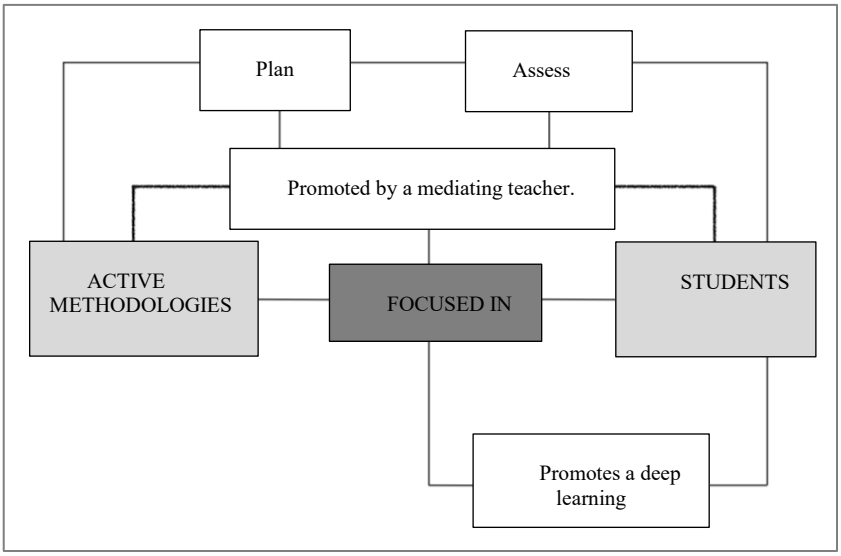

Figure 1. Operational scheme of active methods
Source: Silva and Maturana, 2017

Figure 1 above presents a clear diagram of how active methods work. The teacher's mediating approach plans activities that foster the students' participation. This means that there must be a change in the arrangement of the teaching-learning process that drives deep student learning by conducting significant activities that foster reflective, active and autonomous attitudes (Pérez-López *et al.*, 2017).

Finally, due to the peculiarities and demands inherent in methodological renewal and implementation of active methods in educational centres, the design of educational spaces will have to be transformed; the current facilities must be upgraded to turn them into appropriate environments in which to implement these renewed methods. The goal is to provide educational spaces that can meet the new needs and which, rather than restricting, will support implementation of active learning strategies (Park and Choi, 2014).

Thus, teaching methodology will have a key role in the design and architecture of educational spaces. Educational spaces that allow more flexibility and adaptation to active methodologies and new group and space organisations (Fombella, 2019). Educational spaces that drive pedagogical dynamics where teachers and students inhabit a space that has been designed and conceived in favour of educational practice.

The following section will define the goals that will enable development of this research work and determine the scope and study of the same. These must be measurable, assessable and employ the defined data-collection instruments (Buendía *et al.*, 1998). Consequently, the general goal of this research will be to ascertain whether or not the design of educational spaces significantly influences academic achievement and the teaching methods applied in the same. The specific objectives will also be articulated from this general objective:

- To analyse the features of the classroom and the options it provides as a supportive component in the teaching-learning process.
- To ascertain whether implementation of active methods in classrooms requires adapted infrastructures and equipment.
- To confirm the assumption that the degree of student satisfaction with their classroom space can be a determining factor in the degree to which they take an active part in the class.

2. Methodology

2.1. Method

This paper seeks to provide a well-researched response to the aforesaid goals and hypotheses. A descriptive-correlational study was carried out in which the data and peculiarities of the issues under study were described in order to establish the degree of non-causal association between two or more variables.

To do so, we conducted a quantitative investigation in which the link between theory, research and reality is based on the degree of coincidence between the researchers' perception of reality expressed in a hypothesis and reality as a phenomenon harnessed to ratify a theory (Del Canto and Silva, 2013).

2.2. Participants

The research work was performed in various pre-school, primary and secondary education centres in Ceuta (Spain). The sample was selected by random cluster sampling. This is a probability sampling technique in which the population is divided into multiple groups (clusters) for research purposes and was considered the most appropriate for research into the teaching staff of the centres and the students in the various class groupings. The total sample is composed of 592 people (94 teachers and 498 students) distributed by school and educational level.

The sample of 498 students is divided into the primary, secondary, university prep and vocational training levels (Table 1). The age range in the sample is very wide due to the diversity of educational levels of the respondents; from ten-year-old students in fifth year of primary school to vocational training students as old as forty-four. In terms of gender, 55% of the sample are girls and women and 45% are male.

Table 1.
Student sample by educational level

	Frequency	**Percentage**
Primary	268	53.8%
Secondary	151	30.3%
University prep.	47	9.4%
Vocational training	32	6.4%
Total	498	100.0%

Source: in-house

The teaching staff sample is composed of 94 respondents distributed into various public educational centres and four educational levels as can be seen in Table 2. 71.3% of this sample are women and 28.7% men.

Table 2.
Teaching staff sample by educational level

	Frequency	**Percentage**
Pre-school	13	13.8%
Primary	47	50.0%
Secondary/Univ. prep.	26	27.7%
Vocational training	8	8.5%
Total	94	100.0%

Source: in-house

2.3. Data and information collection instruments

Two questionnaires were used to collect the study variable data. These questionnaires are designed to collect what the respondents do and think by means of written questions that can be answered without help from the interviewer (Buendía *et al.*, 1998). The questionnaires are also subject to validity criteria to ensure that they actually measure what they are intended to measure.

The students' data were collected in a questionnaire designed according to organisational modalities extracted from the study "Diseño de cuestionarios: La opinión y la percepción del profesorado y de los estudiantes sobre el uso de las metodologías activas en la Universidad", by León and Crisol (2011) ["Questionnaire Design: the opinion and perception of teachers and students concerning the use of active methods at University"]. This questionnaire is composed of a dimension comprised of 7 items in which students are asked about their perception of the organisational modalities used by their teachers. There is also a section that consults students about the degree of satisfaction and participation in the classroom by answering three closed-ended questions.

The teachers' data was collected by answering a more extensive questionnaire composed of 54 items and divided into three dimensions. The first dimension is comprised of 20 items and studies the subjects' opinion about the educational space in a questionnaire that forms part of the study "Pautas para estudiar y adaptar los espacios de aprendizaje en centros educativos" ["Guidelines for studying and adapting learning spaces in educational centres"] (Bannister, 2017).

The second and third dimensions are both extracted from the study "Diseño de cuestionarios: La opinión y la percepción del profesorado y de los estudiantes sobre el uso de las metodologías activas en la Universidad" (León and Crisol, 2011) that exhaustively analyses issues concerning the use of active methods in the classroom.

2.4. The procedure

This research work was performed in a series of phases established by the researchers. The surveys outlined above were selected and formulated after an investigative process and a cover letter explaining the usefulness of the research work and the identity of the institution that supports the study (the Spanish University of Granada) was drawn up to accompany each questionnaire. A consent form was also drafted to send to the families to enable them to formally consent to participation of the minor students in the study.

The questionnaires were handed to the teachers of the educational centres by the researchers in person in order to ensure that the agents involved had a clear understanding of the research work and to answer any queries concerning the questions.

2.5. Analysis methods

The information extracted from both questionnaires (teachers and students) was subjected to numerical processing to facilitate subsequent reading of the data. Consequently, the data analysis phase will be able to make sense of the information by processing and organising it in order to explain the issues raised (García and Castro, 2017).

Two analysis methods were used with the support of SPSS (Statistical Package for Social Sciences) Version 26, a very useful software option because it can be used for both descriptive and inferential statistical analysis.

3. Results

Analysis of the information extracted from the two surveys began with a descriptive study of all the items that comprise the questionnaires, thus facilitating a first reading of the data from which to select those that enable the best response to the study goals.

A descriptive analysis of the data was then carried out by means of statistical metrics such as percentages and frequencies. To enable a more comprehensive study, the researchers decided to perform an analytical investigation involving measuring the degree of correlation between the quantitative variables of interest.

3.1. The students' questionnaires

The questionnaires answered by the students are designed to illustrate the most commonly used classroom organisational modalities and to reveal the degree of student satisfaction and participation in relation to this educational practice.

Table 3.
Students research variables and questionnaire items

Frequency of Use in the Classroom				**Organisational Arrangements**
1= None at all; 2= Little; 3= Quite a lot;4=A lot				
1	2	3	4	How satisfied are you with your CLASSROOM?
1	2	3	4	How satisfied are you with the methods your teachers use for the purpose of teaching?
1	2	3	4	Which is your participation level in class?

Source: in-house

With respect to the degree of satisfaction with the method used by the teaching staff, 79.2% of the students surveyed answered "quite a lot" or "a lot" compared to 20.9% who answered "little" or "none at all".

The level of participation in class is closely related to the degree of satisfaction with the method used by teachers and with the classroom itself. We studied the correlation between the level of participation with the method used by the teacher and found that it is statistically significant (x^2 (9) = 84.401, $p<0.05$). The correlation between the variables of the level of participation and the teaching method is moderate (C. Contingency = 0.381, $p<0.05$).

The association between the participation level in relation to the degree of satisfaction with the classroom was also found to be statistically significant (x^2 (9) =29.380, $p<0.05$): see Table 4. The correlation between the level of participation in class and the degree of satisfaction with the classroom variable turns out to be weak (C. Contingency= 0.236, $p<0.05$).

Table 4.
Correlation between the level of participation in class and degree of satisfaction with the classroom

		Degree of Satisfaction with the Classroom			
		None at all	Little	Quite a lot	A lot
Participation level in class	None at all	7.1%	1.0%	2.2%	2.7%
	Little	25.0%	28.3%	17.3%	8.2%
	Quite a lot	21.4%	38.4%	46.7%	40.4%
	A lot	46.4%	32.3%	33.8%	48.6%
	Total	100.0%	100.0%	100.0%	100.0%

Source: in-house

3.2. Questionnaires for teachers

Table 5 shows the research variables and the items of the teacher questionnaires in this research work.

Table 5.
Teachers research variables and questionnaire items

Assessment Scale					**Descriptors**
1=In complete disagree; 2=Disagree; 3=Neither Agree/Nor Disagree; 4=Agree; 5=Strongly agree.					
1	2	3	4	5	There are suitable resources in the classroom.
1	2	3	4	5	The lighting is adjustable and suitable for teaching and learning.
1	2	3	4	5	The acoustics are suitable for the activities carried out.
1	2	3	4	5	Air quality is suitable for the activities carried out.
1	2	3	4	5	Teaching spaces do not promote the use of active methodologies.
1	2	3	4	5	The infrastructures and equipment are designed for master classes.

Source: in-house

The following is the perception of the teaching staff concerning the adequacy of the resources with which their classrooms are equipped: 48.9% are "satisfied" or "highly satisfied", 27.7% are non-committal and 23.4% are "critical" or "highly critical". With respect to analysis of the correlation between the educational level and the teacher's perception of the existence or otherwise of sufficient resources in the room (Table 6), we observed that 53.0% of pre-school and 59.6% of primary teachers fall into the "satisfied" and "highly satisfied" category compared to 34.6% of secondary and university prep teachers while vocational training teachers were the most critical with only 25% approving their classroom's resources. This association is not statistically significant but it shows a clear difference in perception according to the educational level at which our respondents work.

Table 6.
Adequacy of the didactic resources in the classroom by educational level

	Pre-school	Primary	Secondary/ University prep.	Vocational training
Highly critical	-	2.1%	-	12.5%
Critical	15.4%	17.0%	30.8%	25.0%
Non-committal	30.8%	21.3%	34.6%	37.5%
Satisfied	46.2%	46.8%	30.8%	25.0%
Highly satisfied	7.7%	12.8%	3.8%	-
Total	100%	100%	100%	100%

Source: in-house

We obtain similar scores for all three variables when we analyse the teachers' perception of the quality and suitability of the lighting, the acoustics and air quality (Figure 2). The scores in the non-committal range (neither critical nor satisfied) are also unusually high: lighting 26.6%, acoustics 35.1% and air quality 29.8%.

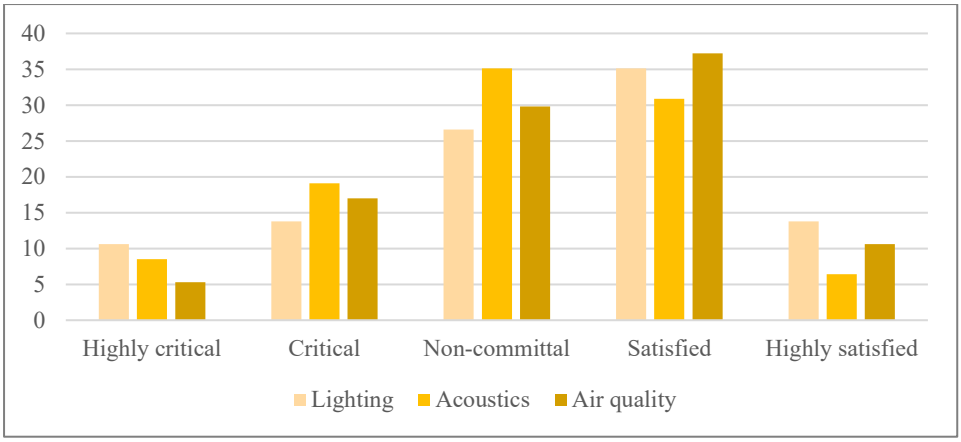

Figure 2. Quality and suitability of lighting, acoustics and air quality according to educational levels of the classes
Source: in-house

Of the total sample of teachers surveyed, 61.7% agree or strongly agree that the spaces designated for teaching do not foster implementation of active methods. Moreover, 63.8% of those surveyed agree or strongly agree with the statement that the infrastructures and equipment are designed for teacher-centred methods. A statistically-significant association between these two factors can be observed (x^2 (9) =72.975, $p<0.05$).

The correlation between the above variables is relatively strong (C. Contingency= 0.661, $p<0.05$). Table 7 shows how the degree to which the respondents' perceive that the infrastructures and equipment are designed for teacher-centred classes is inversely proportionate to their perception that they are suitable for active pedagogical methods.

Table 7.
Correlation between spaces intended for teaching and the equipment and infrastructures

		The infrastructures and equipment are designed for teacher-centred classes			
		Strongly disagree	Disagree	Agree	Strongly agree
The spaces intended for teaching do not foster the use of active methods.	Strongly disagree	57.1%	3.7%	3.1%	3.6%
	Disagree	28.1%	66.7%	15.6%	14.3%
	Agree	14.3%	22.2%	68.8%	25.0%
	Strongly agree	-	7.4%	12.5%	57.1%
	Total	100.0%	100.0%	100.0%	100.0%

Source: in-house

4. Discussion

The main goal of this research was to ascertain whether the design of educational spaces influences academic achievement and the teaching methods that are implemented in them. The results from both samples – students and teachers – provide enlightening answers that are always consistent with the theoretical frame of reference.

In general, the students surveyed are satisfied with the method used by their teachers although this criterion is affected by opinion biases depending on the different educational level of the population. Secondary students are more critical in this aspect, probably due the change processes inherent in adolescence and the need to play a more active role in society.

Another important correlation is that the level of participation in class is directly related to the degree of the student satisfaction with the method used by the teachers. Consequently, the teacher's goal will be to place the students centre-stage, enabling them to develop their active approach in the classroom (Luelmo del Castillo, 2018).

Lastly, the result of analysis of the students' questionnaires reveals a direct correlation between the degree of satisfaction with the classroom and the level of participation in class. Thus, our conclusions coincide with those of Duarte (2003) whose study determined that fostering an environment that makes communication and encounter possible and encourages the free expression of ideas and exchange of interests is necessary. In this way, students who are comfortable in their educational space/classroom will be able to "establish a communicative. affective and circular interaction between the teacher and the group" (Duarte, 2003, p.8) transforming the classroom environment into a space that promotes learning. Also, it entails students who can actively participate in the design of their workspace (Walden, 2015); thus, becoming a more active agent in the process of their education.

The teachers find that their classrooms lack resources, but the degree to which they are indifferent to factors such as lighting, acoustics and air quality – indispensable components for proper educational habitability – that would seem to be vital to the students' comfort in the classroom, is remarkable. The teachers are also of the opinion that the spaces provided for their pedagogical task do not encourage the use of active methods since they are designed for teacher-centred activities. Consequently, as Laorden and Pérez (2002) argue, the pedagogical dynamic is undermined by the design of the educational spaces and the classroom becomes a constraint on meaningful educational activity.

It is possible to conclude that the characteristics and infrastructures of the educational centres have a direct connection with the teaching-learning process. Besides, educational spaces, as can be seen in the results, are key and support factors when they have been designed in the pursuit of pedagogy. Therefore, it will be of great importance to support the joint work of architects, teachers and pedagogues, fostering the creation of a quality educational environment for the entire educational community (Laorden and Pérez, 2002).

5. Conclusion

This document is the result of research carried out in a series of public educational centres in the Autonomous City of Ceuta (Spain). It has contributed to strengthening the interest aroused by the subject among both the researchers and the educational community. It provides the opportunity for extending the scope and context of the study with the aim of driving improvements in present-day educational spaces.

This reality must be studied by articulating the dialogue between architecture and pedagogy with the ultimate goal of achieving educational spaces that properly represent the educational project and foster methodological renewal.

References

Balongo, E., & Mérida, R. (2016). El clima de aula en los proyectos de trabajo. Crear ambientes de aprendizaje para incluir la diversidad infantil [Classroom environment in work projects. Creating learning environments to include child diversity]. *Perfiles educativos*, *38*(152), pp. 146-162. https://doi.org/10.22201/iisue.24486167e.2016.152.57602

Buendía, L., Colás, M., &. Hernández, F. (1998). *Métodos de investigación en psicopedagogía* [*Research methods in psychopedagogy*]. Madrid, Spain: Mc Graw-Hill Publisher.

Del Canto, E., & Silva, A. (2013). Metodología cuantitativa: abordaje desde la complementariedad en ciencias sociales [Quantitative methodology: A complementarity approach in social sciences]. *Revista de Ciencias Sociales (Cr), 3*(141),25-34. Retrieved from: http://www.redalyc.org/articulo.oa?id=15329875002

Duarte, D. (2003). Ambientes de aprendizaje: una aproximación conceptual [Learning environments: A conceptual approach]. *Estudios pedagógicos (Valdivia)*, *29,* 97-113. http://dx.doi.org/10.4067/S0718-07052003000100007

Earthman, G. (2002). School Facility Conditions and Student Academic Achievement. *UCLA's Institute for Democracy, Education, and Access*. Retrieved from: https://escholarship.org/uc/item/5sw56439#author

Fombella Coto, I. (2020). Experiencias activas, espacios pasivos. Una propuesta de Educación Artística contemporánea en espacios tradicionales [Active experiences, passive spaces. A contemporary art education proposal in traditional spaces]. *Tercio Creciente*, (extra4), 47–58. https://doi.org/10.17561/rtc.extra4.5767

Fombella Coto, I., Arias Blanco, J., & San Pedro Veledo, J. (2019). ARQUITECTURA ESCOLAR Y METODOLOGÍAS DOCENTES EN EL SIGLO XXI: RESPUESTAS A UN NUEVO PARADIGMA EDUCATIVO [SCHOOL ARCHITECTURE AND TEACHING METHODOLOGIES IN THE 21st CENTURY: TOWARDS A NEW EDUCATIONAL PARADIGM]. *Revista Inclusiones*, *6*(4), 65 - 91. Retrieved from: https://revistainclusiones.org/index.php/inclu/article/view/91

López-Belmonte, J., Segura-Robles, A., Fuentes-Cabrera, A. & Parra-González, M.E. (2020). Evaluating Activation and Absence of Negative Effect: Gamification and Escape Rooms for Learning. *International Journal of Environmental Research and Public Health, 17*(7), 1-12. https://doi.org/10.3390/ijerph17072224

Luelmo del Castillo, M. (2018). Origen y desarrollo de las metodologías activas dentro del sistema educativo español [Origin and evolution of active methodologies in the spanish educational system]. *Encuentro 27*, 4-2. https://doi.org/10.15517/rcs.v0i141.12479

Palacios, A. (2015). *Inventando mundos. Diálogos creativos con David Gamella* [Inventing new worlds. Creative talks with David Gamella]. Alcalá de Henares: Centro Universitario Cardenal Cisneros.

Park, E.L. & Choi, B.K. (2014). Transformation of classroom spaces: traditional versus active learning classroom in colleges. *Higher Education 68,* 749–771. https://doi.org/10.1007/s10734-014-9742-0

Pérez López, C. & Laorden Gutiérrez, C. (2002). El espacio como elemento facilitador del aprendizaje: una experiencia en la formación inicial del profesorado [Spaces as a learning facilitating element: An experience at the beginning of teachers training]. *Pulso: revista de educación,* (25), pp. 133-146. https://doi.org/10.15517/rcs.v0i141.12479

Pérez-López, I. & Rivera García, E. (2017). Formas docentes, formar personas: análisis de los aprendizajes logrados por estudiantes universitarios desde una experiencia de la gamificación [Training teachers, training people: An analysis of the learning achieved by university students from a gamification experience]. *Signo y Pensamiento, 36*(70), 112-129. https://doi.org/10.11144/Javeriana.syp36-70.fdfp

Silva Quiroz, J. & Maturana Castillo, D. (2017). Una propuesta de modelo para introducir metodologías activas en educación superior [A model proposal to include active methodologies in higher education]. *Innovación educativa* (México, DF), *17*(73), 117-131. Retrieved from: http://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S1665-26732017000100117&lng=es&tlng=es