

Teaching reflections about the architectural design of the vocational training centers in Granada

Reflexiones docentes acerca del diseño arquitectónico de
los centros de formación profesional en Granada

Luis Rodríguez^{1a}, José L. Gallego^{2b} & Antonio V. Rodríguez^{2b*}

¹Consejería de Educación de Andalucía, Sevilla, España.

²Universidad de Granada, Granada, España.

^aPhD in Architecture. Vocational Training Professor. Education and Science Office of Andalucía. ^bPhD in Pedagogy. Associate Professor of the Department of School Didactics and Organization. School of Education Sciences. Universidad de Granada.

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***Correspondencia**

Email: arfunte@ugr.es

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Summary

If the specificity of the architectural space is considered as a measuring element in the education scope to value the prominence of teaching throughout history, it is worth mentioning that the configuration of the vocational training center as a first-rate education scenario that arrives half century of delay with respect to schools, has few references of very specific period. At present, they continue excessively contaminated because of the continued struggle for linking them with other education levels. This article is focused on this issue. To that end, by interviewing experienced teachers, we value: a) from the most conceptual aspect, elements and architectural spaces that should have those reference centers; b) the appropriateness of the arranged spaces, not only those that meet the regulatory requirements but those that meet the criteria of the centers; c) to the most specific aspects on the way to optimize the arranged space in order to achieve a larger curricular extent. It concludes with a high positive assessment of the opportunity of having the necessary spaces for teaching, relying more strongly on those favoring the free relationship of students and allowing the permeability among the different disciplines that converge in the center.

Keywords: Architectural spaces in vocational training, potential of space in the development of relationships, the permeability in classrooms, “Big Workshop”.

Resumen

Si se toma como medidor la especificidad del espacio arquitectónico en el ámbito educativo para valorar el protagonismo que a lo largo de la historia han tenido las enseñanzas, cabe destacar que la configuración del centro docente para la formación profesional, como escenario educativo de primer orden, que llega con medio siglo de retraso respecto a las escuelas, cuenta con escasos referentes que responden a un periodo muy concreto y que, en

la actualidad, persisten excesivamente contaminados debido a la continua puja por la vinculación de estas con otros niveles educativos. Esta cuestión es la temática en la que se centra el presente artículo. Para ello, y recurriendo a la entrevista de docentes con experiencia, se valora: a) desde lo más conceptual, elementos y espacios arquitectónicos que deben caracterizar los centros de referencia; b) la pertinencia de los espacios dispuestos, tanto los que responden a requerimientos reglamentarios como a los criterios de los propios centros; c) hasta los aspectos más concretos sobre la manera de optimizar el espacio dispuesto para alcanzar una mayor amplitud curricular. Se concluye con una valoración muy positiva de la oportunidad de espacios precisos para estas enseñanzas, apostando con fuerza por aquellos que propician la libre relación del alumnado y permiten la permeabilidad entre las distintas disciplinas que convergen en el centro.

Palabras clave: Espacios arquitectónicos en la formación profesional, potencial del espacio en la generación de relaciones, permeabilidad en las aulas, Gran Taller.

Introduction

The singularities of the emerging educational programs, including changes that may involve the teaching task, require a continuous attention to the spaces in order to adapt them to their precise function. For architect Rasmussen (2000) this represents the key objective of architecture. There are many authors in the educational field who emphasize the importance of Education Space. This is the case of Viñao (2008) who considers the value of school space is unquestionable due to its educational dimension, thus it warrants the stability and specificity of educational buildings. Otálora (2010) goes further. He considers it a learning environment or scenario of knowledge construction, and therefore it should be seen as a tool or resource in the pursuit of educational achievement. In the same vein, the architectural structure that defines the school space is, according to Escolano (2000, as cited by Rojas, 2011), essential for both, school organization and functioning of academic life itself, and even for behaviors generated in educational settings. From this same perspective, several authors (Zabalza, 2002; Gairín, 2004; Lorenzo, 2005; Antúnez & Gairín, 2009, among others) are expressing their interest in the educational space, classifying it within the School Organization discipline as another resource to take into account. On the other hand, from the sociological field, Hernandez (2010) informs on the need to consider the habitability of school spaces for the creation of effective teaching-learning processes.

Even some authors, like Toranzo (2007), convinced of evident affinity between school architecture and pedagogy, continue expressing that school spaces in the curriculum are not given the necessary importance. The concern for the completion of educational spaces in schools begins to be legally considered from the early twentieth century¹, and it becomes

¹ The Hygienic Regulations for school constructions were passed in 1905, and 1920 the Spanish Ministry of Public Instruction created a technical department for school constructions which enhances the importance of the architectural project.

consolidated during the first third of it. It implied the end of reuse of spaces originally designed for non-educational purposes. Thus, it rendered its first fruits from 1930. As a result from the reconciliation between architecture and pedagogy, with the creation of a large number of school buildings in Spain (Añon, 2015).

This school architectural development does not occur likewise in all educational stages. In the case of Vocational Training (VT), the historical route is relatively short (Gallego & Rodríguez, 2011). Regulation and institutionalization of these teachings and, therefore, the final step of this educational center as a place of training, would not arrive until the end of the first third of the twentieth century, with the VT Statute of 1928 (Rico, 2012). However, due to its low affinity with demands of work, this law was not very successful (Cabrera, 1997). For this reason, it was barely significant for the configuration of VT spaces.

With Labor Institutes arising under the Framework Law of 1949 on Secondary and Professional Education, the race to build appropriate spaces for VT teachings started with interest. These buildings, which constitute the first reference to new creation² of VT School Architecture, include workshops and traditional classrooms. In this way occurs the consolidation of a new architectural specification in these school buildings (Irles & Pérez, 2012).

² The Daimiel Labor Institute is the most significant landmark. It was built in 1951 by architect Miguel Fisac. It is a reference in future industrial masters schools, and even in the Spanish architectural modernism, thus breaking with the traditional architectural monumentalism.



Image 1. Workshop of Daimiel Labour Institute (picture taken from Miguel Fisac Foundation <http://fundacionfisac.org/guia/?id=6>).



Image 2. Workshop School of Industrial Masters of Granada (picture provided by the director of Ies H. Lanz).

The greatest period of architectural development was reached some time later with the Industrial Masters schools that, regulated by the Industrial VT Law of 1955 and as a consequence of the industrial boom of the moment and the VT teachings homogenization (Martinez, 2015), they expanded throughout the national territory, sometimes as significant architectural models of the modern movement. Thus, VT infrastructure specialization acquires a new dimension that approaches that one already existing in other educational levels.

In relation to the design of architectonic spaces, the legislative framework, that regulates the current interventions on VT teachings and due to the need of new schools or actions on existing ones, distinguishes two types of spaces. On one side, the usual facilities³, among which are the offices for school management, planning and orientation activities, secretarial activities, library and teachers' room, appropriate to the number of school places, in addition to restrooms and services adjusting to current regulations. On the other side, specific spaces⁴ or independent spaces linked to the curriculum of each type of training, which will be defined in the corresponding Royal

³ Article 3 of Royal Decree 132/2010, dated February 12, which establishes the minimum requirements of institutions teaching in the second cycle of early childhood education, elementary and high school education, and Article 9 of Royal Decree 1147/2011, which establishes the general organization of the VT Education System.

⁴ Article 46 of Royal Decree 1147/2011, establishes the overall organization of the VT Education System.

Decreases and will aim to achieve the learning outcomes of each professional module (Rodríguez, 2014).

The methodology process used in the intended research is guided by three very specific objectives, which ultimately aim to know to what extent the design of VT institutions can be beneficial to the educational success and, in this sense, what aspects or criteria should be taken into account in future corresponding architectural projects. The starting point includes the following questions:

- What do VT teachers think about the potential design of the buildings in which they develop their educational work?
- Do the spaces provided for these centers actually fit the specific nature of their teaching and students?

The following operational objectives arise based on the above questions and they support the overall objective determined above:

- Highlight the importance that teachers give to educational centers design, outlining the architectural features and spaces of greater relevance in the development of the VT teachings.
- Analyze and describe teachers' opinions on the suitability of the spaces provided by the regulatory provisions and the ones actually arranged in the VT teaching centers.
- Assess social needs of interaction that may arise among students assigned to different teachings offered at the same center; and gather, among teachers, architectural proposals that meet those needs.

Methodology

This is a non-experimental research based on a transversal design eminently qualitative, although data gathered through the technique of semi-structured in-depth interview, described below, it has been subjected to quantitative analysis. Thus, this research overcomes the obsolete war between paradigms (Díaz, 2014), supporting not only the non-simultaneous combination of them, but also the simultaneous integration of each other, with the only intention of achieving the objectives (Gallego & Rodríguez, 2016), in order to complement the comprehensiveness of reality studied, obtaining an increased performance in data interpretation of reality that promotes an appropriate transformation of the educational practice (Salvador, 2001).

Participants: Population and Sample.

The population is composed of all VT teachers at Intermediate and Advanced Educational Cycles of the Spanish context, since they share the legal architectonic regulations for construction and spatial allocation. Nevertheless, the source of the sample is located at the Secondary School «Hermenegildo Lanz», Vocational Training center located in Granada. This is because the educational variety offered, and its number of teachers this school has are high enough to ensure the representativeness of the population (Rodríguez, 2014). A set of teachers is selected based on a series of requirements. These teachers have sufficient knowledge on the operation of vocational training centers, so that their answers meet the objectives; therefore, the conclusions can be applied to other similar centers. As selection criteria it has the following requirements: a minimum of ten years of experience as a VT teacher, teacher working experience in at least three different centers where VT is taught, and at least three consecutive years of experience at the selected center. It is therefore an intended stratified sampling.

In order to gather the most diverse and generalizable opinions possible there were other requirements imposed on this sample: On one side, that all professional families of the center are represented, and on the other side, that it is composed of the different members composing the different departments: heads of departments, secondary school teachers and VT technical teachers. Thus, the sample consisted of 12 teachers: two from each of the six professional families offered at the center, where one of them holds the position of head of department, and the two teaching bodies are represented. Therefore, if one is a VT technical professor, the other one chosen will belong to the group of secondary school teachers, or conversely (See Table 1).

Table 1.

Research subjects.

Code	Department	Position	Teaching experience	N° Target Centers	Years working at the center
J1	Vehicles maintenance	Head of department /Secondary School Teacher	22	9	12
P1	Self-propelled	VT Technical teacher	17	6	11
J2	Activities Physical And Sport	Head of department	18	3	15
P2		Secondary school teacher	28	3	20
J3	Building and Civil Work	Head of department / Secondary School teacher	18	3	10
P3		VT Technical teacher	12	3	4
J4	Electricity and Electronics	Head of department /Secondary school teacher	15	4	14
P4		VT Technical teacher	22	5	7
J5	Information technology	Head of department /Secondary school teacher	14	3	6
P5		VT Technical teacher	14	4	9
J6	Maintenance and Services to Production	Head of department /Secondary school teacher	26	3	15
P6		VT Technical teacher	12	5	6

Data Collection Instrument.

In order to gather information on teachers' opinion about the importance and potential of the educational spaces in the educational process, guided interviews were performed using a previously designed questionnaire which confers it a semi-open position. The document is structured in two parts (Annex A):

- First, the part in which data on the respondent's educational experience is collected, in order to clarify that he/she meets the requirements referred to in the preceding paragraph, and objective pursued by the interview to facilitate the subject's positioning.
- The second part is composed of different questions that guide the process and they are organized into three sections:
 - The first one addresses more general issues concerning the architectural elements that, according to the subjects' opinion, should single out the spaces of school buildings, with questions like:
 - » Do you think that the physical conditions of the building, where the educational task takes place, influence the achievement of educational goals set?
 - » What architectural aspects do you consider to be essential at an educational center?
 - » What spaces, in addition to the ones corresponding to each professional family, do you consider that should distinguish a VT center from any other secondary education school?
 - In order to get more accurate data from the participants on the architectural aspects that, in their opinion, have greater relevance in the educational process, the following questions

brings the subject's attention on the spaces provided at the center of reference and their influence on the educational processes:

- » Do you consider that architectural features of the specific spaces provided at the centers affect school outcomes?
 - » Are the specific spaces set as the minimum spaces for your specialty training courses enough? Or on the contrary, do you think it is necessary any other educational space?
 - » Are the educational spaces designed with sufficient flexibility to respond to the legislative changes? Or, conversely, do they determine the curriculum development?
- Finally, the aim of this third section is to know about the importance, according the respondents' opinion, of the architectural space in the development of cross-cutting aspects of the curriculum, through strengthening of relations between the main players of the teaching and learning process. Moreover, this section aims to know their opinion on what they think should be the requirements schools should meet for these circumstances. These are the following questions:
- » What do you think about the need for interdisciplinary relations at VT centers and about the importance of the building design in this regard?
 - » What architectural criteria do you think should be taken into account at the VT centers to prevent isolation among students of different departments?

Both, dimensions and questions, were validated. In the first instance, by the experts' opinion (teachers of the researched center and the university where this research was included). For this, an assessment rubric was duly conducted by each expert using different criteria, such as length and duration, valid and generalizable, sensitive and committed. In this first round of review

a high concordance rate was obtained (above 4, on a scale from 1 to 5), with an agreement percentage equally high (above 90%). In the second instance, scripts were validated in the first experimental interviews, which also served to establish guidance codes.

Data Processing and Analysis.

In order to analyze the interviews content, once transcribed, a series of codes or categories have been previously created (McMillan & Schumaker, 2005; Stake, 2010) due to the lack of theoretical models of reference on the scrutinized dimension (Flick, 2004) that, based on the objectives, will allow us the grouping and reduction of information (Fernández, 2005; Tojar, 2006). For this, the most relevant interviews were selected, one for each of the three representative groups of subjects (heads of department, secondary school teachers, and VT technical teachers). Taken as models, they have been analyzed in depth by experts (teachers and researchers) from different contexts: secondary and university education.

The codes resulting from the above process are grouped into three levels corresponding in parallel with each of the questionnaire sections (See Annex I); this is:

- Importance given to the architectural elements in VT educational spaces.
- Influence the arranged school space could have on the results of educational processes, considering their actual use.
- Assessment of common use spaces arranged in the centers or established by regulatory provisions, according to their potential as sources of relations.

Results

Following the structure set in the methodology section, we present the results derived from the interviews grouped into three sections. Regarding VT centers, the first section allows us to know the architectural aspects that have greater consideration among teachers, as well as the relevant spaces or uses based on the singularity of teachings and ages of the students involved. Next we present the resulting data of the assessment made of the spaces that, in accordance with regulatory provisions established at a general level (or common use spaces), and those linked to the different training options (or specific spaces), should be provided for the development of these teachings. The third section shows, as a summary, the importance given to the architectural design in regards to mitigate or eliminate the isolation that tends to appear between the members (teachers and students) assigned to the different teachings or training cycles offered at the educational center. It concludes with an explanation of the analysis performed on the architectural criteria that, as shown on the surveys, are considered fundamental at VT centers to strengthen relations between its members.

Importance of School Space in the Teaching-Learning Process.

As to the importance of architectural features of the educational center, all teachers agree on the importance of the conditions or characteristics of the space in which educational work is developed and, therefore, the direct relationship between these and the achievement of educational objectives set in the educational projects. In support of their answers, the subjects make reference to one or more architectural characteristics of the space they consider essential at these centers (for example, lighting and ventilation) and, to a lesser extent, specific areas that should be part of their organizational charts (as the auditorium), issues that were addressed in the second and third item of the questionnaire, respectively. These are the results obtained:

Architectural Aspects of Greater Relevance for VT Teachings.

The importance that teachers give to the different architectural aspects in the VT educational field is shown as follows:

- Natural lighting has been highlighted by most subjects, nine of the twelve in the sample (all except J2, J3 and J6), that is, 75% of respondents.
- The existence of spaces of appropriate dimensions was indicated as relevant six times, 50% of the group (subjects P1, P5, P6, J1, J3, J4).
- Thermal condition is cited four times (subjects P3, P5, P6, J6), representing 33.3% of the sample.
- Accessibility at the center and mobility in the classroom were mentioned three times (subject P3, P4 and J5), coinciding in number with natural ventilation (subject P4, P6 and J4), representing 25% of the sample.
- Adequate protection against noise is mentioned twice (P3, J3), that is a percentage of 16.7%.
- Solar orientation was mentioned only once (subject J6), representing only 8.3% of teachers.
- There are two aspects none of the teachers considered relevant in the educational process. Reference was made in the questionnaire, these are: the spaces versatility and interior arrangement of the classroom.

To facilitate a comparative view of the above, results obtained are displayed below (Figure 3), referring to aspects that have had some representation:

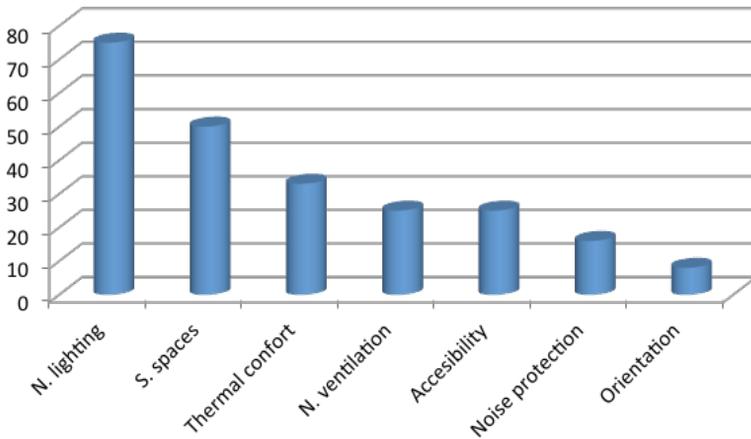


Figure 3. Architectural aspects highlighted by its relevance.

Fundamental Architectural Spaces in VT Centers.

All respondents outlined the need for VT centers to have unique architectural spaces that respond to the specificity of their teachings. According to teachers, the specific spaces or uses that should be included in the programs are: auditorium, computer rooms for general use, spaces for students to relate freely, technical museum and specialized classrooms. The importance given to each of these spaces, according to the number of times indicated by teachers, is ordered from highest to lowest, as follows:

- In the first place is the Specialized Classrooms (SC), which is a name assigned to educational spaces appropriate or planned for the curricula of the different teachings. These have been identified by all subjects without exception, representing 100% of the sample. One example of SC is a paint laboratory.
- Nine subjects, 75% of the sample, agree on the need for spaces for free student relationship.
- The importance of other spaces, such as the technical museum, computer rooms for general use and the auditorium, has not been as outlined since they were referred to once only, surprisingly

representing just 8.3% of teachers, given the importance of their inclusion.

To summarize, and in order to provide an overview, the above data are collected in the chart below (Figure 4).

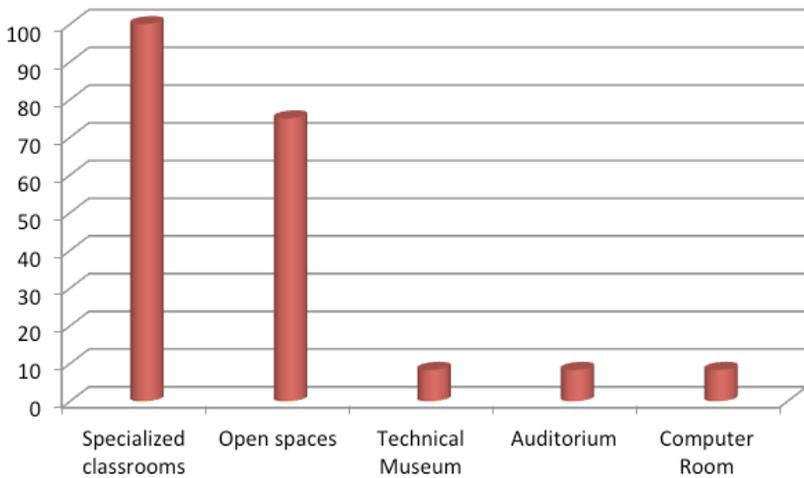


Figure 4. Architectural spaces outlined by relevance.

Assessment of Specific Spaces Arranged at VT Centers.

The first questions of the second section are aimed to know the subjects' opinion on the relevance of spaces provided in schools for the curricula development of different teachings offered therein; that is, the specific spaces whose relevance is demonstrated in the previous section. The aim is to determine whether architectural design can benefit, or otherwise, limit the teaching work.

Assessment of the Influence of Architectural Conditions of Specific Spaces provided on School Achievement.

Based on the data obtained, it can be deduced that almost all of the sample components consider that space condition, in which educational work is developed, is crucial to school success. Eleven of twelve answers have been

coded positively, which represents 91.7% of respondents. However, their answers are differently supported and can be separated into three groups based on their similarity:

- Eight of the subjects, 66.7% of the total, directly relate the architectural conditions with the students' comfort, and therefore with their school performance.
- Difficulties that may arise during the curriculum development, due to the inadequacy of the spaces provided with specific contents, is the main problem outlined by two of the teachers, 16% of the sample.
- The remaining subject distinguishes his answer from the others referring that his statement is based on issues of psychopedagogical nature that exceed those corresponding to the curricular limitations expressed by his peers. However, it is important to highlight that this teacher, who diminishes the importance of the architectural conditions and gives all the responsibility to teachers, recognizes that there are starting elements essential in the teaching-learning process. He specifically referred to an adequate lighting in classrooms.

Assessment of Measures set by the Current Regulations on Architectural Requirements at VT Centers.

Although respondents are slightly inclined to consider them insufficient, there is no clear rule among the respondents when assessing the relevance of architectural spaces governed by the regulations associated with different educational services. Of the eleven that, as stated in the previous section, outlined the importance of spaces provided, 60% of the answers has been coded negatively, 20% positively, and the remaining two answers have not been coded, mainly because of ignorance or lack of interest by respondents on the regulations established.

There are two groups among the ones who express their disagreement with the regulations. The group with a greater representation, four of the six subjects, considers that the required planning is inadequate due to the lack of connection between the required spaces and the rest of the curriculum elements, mainly contents and methodologies. The remaining two subjects consider that the curricula change at certain intervals, but buildings do not change accordingly. This makes spatial requirements of previous regulations are kept the same.

Both groups, the subjects who positively consider what the regulations establish, as well as the subjects who diminish importance to what is established in regards to school architecture; categorically agree on one main problem: The disregard on the part of schools and administrations towards the issues discussed herein. As a result, they say that Spanish laws or other regulatory requirements are usually not complied with.

Flexibility of School Architectural Designs for its Adaptation to Emerging Educational Projects.

Although the previous answers reflected, on numerous occasions, the subjects' opinion on the predisposition of the school space established in regards to the curricula modifications, this section expressly refers to its corresponding domain among the entire sample; thus, to adequately achieve one of the objectives proposed. For this, the subjects were asked to provide a general assessment on the way teaching sites were found, that were probably designed for a very different educational project than the one they have to develop. The reference, Secondary School "Polytechnic Hermenegildo Lanz", is noted in order to reach a higher level of the case selected.

There is a noticeable trend towards a negative assessment of the VT spaces adaptability to new pedagogical approaches that incorporate the different educational programs. 67% of the subjects considers that preexisting

locations are a determining factor in the development of educational practice, compared to a 33% who manifests not have encountered difficulties with the curriculum development at any time because of the architectural conditions.

Among the eight answers that have been coded negatively, the one standing out is the limited analogy between the existing space and new versatile educational trends of the same. On three occasions, it was expressly alerted of the need to readapt architectural infrastructure to the implementation of new educational programs. Otherwise, they say, this takes a curricular importance, conditioning the pedagogical proposals, which does not benefit school teachings.

On the other hand, the other four subjects undermine the importance of architectural appearance. They are in favor of an immediate resources provision more adequate to the new educational demands. This solution is presented, within this group, as the only way to break with the dominant methodology, which they consider as the main pedagogical conditioning factor.

The Importance of Architectural Design in Student Relations.

Although different departments meet at the same architectural space or scenario, all teachers are aware that there is a high degree of isolation among students of the different professional families as a result of the lack of affinity between their curriculum elements.

Assessment on the importance of promoting social relations at VT centers in the students' training.

There is an absolute consensus when assessing the importance that, on VT students' training, interdisciplinary relations have between the different students of these centers. All sample answers, except one, have been coded positively, representing a domain of 91.7%.

Teachers who positively assess the need to promote interpersonal relationships in VT centers completely agree when supporting their position, that responds to issues related to the hidden curriculum. Furthermore, on four occasions, 36.7% of this subset manifests its interest towards the good effect that could have a regular contact between students in regards to future educational decisions. In this way students would be able to know directly from their peers about other educational options.

The teacher who disagrees with his colleagues justifies his position by placing first the need to develop the established curriculum that, in his opinion, is too tight to school hours and does not allow students to have time to interact freely.

Architectural Criteria Provided as Solutions to avoid Isolation of VT Students

Following the line drawn in the previous paragraph, the subjects were asked their opinion on the importance that architectural design may have in creating relations at VT centers. They all highlighted the potential of the architectural space provided, describing it as the key player.

Finally, in order to obtain conclusions that can be implemented as architectural criteria for the design of VT centers, and in this way responding to one of the objectives set, teachers were asked about the spaces that should be arranged or how the existing spaces should be linked to benefit the creation of relationships. They all had some input, but one, who claimed not to know how to solve the proposed question. Based on the answers analysis, there are proposals that are repeated to a greater or lesser extent. Below they appear in their hierarchical order:

- The increased permeability of the spaces associated with the different professional families, especially those where more practical lessons

are performed. This solution points to the idea of the Big Workshop, and it is supported by four subjects, 33.3% of the whole.

- The closeness between professional families through the centralization of some specific areas assigned to each of them, so that there are connecting links or common spaces for students of different departments, is indicated as the best solution for two teachers, representing only 16.7% of the sample.
- Five of the twelve teachers, 41.7%, thinks that the isolation could be prevented by providing a large central or common space for the entire center which has enough potential to attract flows of students every day.

Below you will see all the data resulting from the previous analysis (Figure 5):

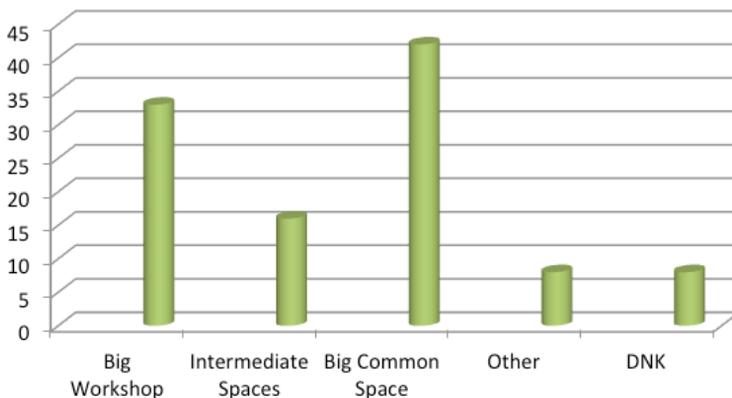


Figure 5. Architectural criteria proposed by the subjects as solutions to avoid isolation at VT centers.

Conclusions

This study has allowed us to know the teachers' opinion about the importance of space in the educational process. To this end, the following was assessed: The aspects and most important architectural spaces at the center, the administration's consideration regarding these issues when establishing

regulations for the development of teachings, as well as the schools' consideration regarding the corresponding provisions; and finally, the importance of architectural design in order to avoid isolation among students that within the center, do not share the same curriculum. It concludes with the collection of precise proposals to prevent it.

In relation to the first section, teachers have the same idea in general: the conditions of the settings in which VT teachings are developed are determining factors in the educational process. In relation to the design of these type of centers, the aspects that concern the most are, in a hierarchical order, the following: Natural lighting, appropriate space for the teachings, thermal comfort, ventilation and accessibility. And as for the required spaces, the most relevant were: The specialized classrooms, since they are best suited to the curriculum content; and the spaces for the free student relationship, because they have a priceless socializing value.

After knowing the teachers' opinion on the specific spaces arranged at the center for each of the teachings, it is possible to state that school success depends on these spaces, mainly because they have direct relation with the students' comfort. Ever since the regulatory provisions specific spaces have been associated with the different educational offerings and there is slight inclination to consider them unsuitable. The lack of affinity between the regulated spaces and the emerging methodologies; and the influence of the existing space considering the inflexibility of the predesigned buildings, are -in that order- the causes of the above consideration. It is evident that there is a high degree of agreement regarding the little concern on the part of schools towards the compliance of the requirements established in the current rules and legal provisions and, in general, the limited control about it on part of the Spanish educational administration.

Finally, in relation to the personal and/or social relations at VT centers, it is fair to say there is a tendency to isolation associated to

the different educational teachings, as a consequence of the curricular differences. Therefore, the architectural design could be a key element to prevent this tendency. Different solutions (as architectural criteria) were proposed. None of the proposed solutions was particularly predominant and they are structured according the number of repetitions, the most relevant are: a large common area, the highest permeability of the specific spaces “Big Workshop” and multiple spaces for relationship between different specific spaces.

Discussion

No data was found that focus exclusively on the assessment of the spaces at the VT centers. However, we cannot say the same about other institutions, like primary education schools that have reached a higher level of development. However, when addressing more general issues, data can be extracted from other authors that can be compared to those resulting from this research, predominating in all cases a clear tendency towards convergence. This is the case of Toranzo (2007), who after analyzing the criteria of dominant school design, characterized by conceiving the classroom as the main space and setting aside open spaces, concludes on the importance of creating more dynamic spaces, instead of enclosed spaces, due to the educational potential they provide. Rojas (2011), although his studies focus on other educational levels, he informed about the risks of limiting school spaces to classrooms only, since these barely generate significant interactions. Arias (2013) also highlights the need of participation and expression spaces as a way to deal with repressive environments at educational centers due to lack of physical interaction.

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Appendix A. Open interview questions for research participants.

CUESTIONARIO-GUÍA PARA LA ENTREVISTA CON LOS AGENTES	
NOMBRE	<i>Identificación del entrevistado, aunque se respetará anonimato</i>
ADSCRIPCIÓN	<i>Profesor y/o jefe de Dpto.</i>
EXPERIENCIA	<i>Años en el centro y/o en otros de formación profesional</i>
<input type="checkbox"/>	¿Conoces la distribución de espacios que la legislación dispone para los estudios de FP? (En caso negativo, el investigador puede resumir los espacios o entregar al investigado la normativa vigente al respecto, con indicación de los mismos).
<input type="checkbox"/>	¿Qué opinión te merecen los anteriores recursos espaciales contemplados en la legislación de FP para el objetivo de la misma? (El investigador puede ejemplificar alguno de ellos, aulas, talleres...).
<input type="checkbox"/>	¿Qué opinas de los espacios en la etapa de FP en relación con los espacios en otras etapas, por ejemplo, de secundaria? (Se hace énfasis en la secundaria puesto que ambas etapas están integradas en un mismo centro).
<input type="checkbox"/>	¿Cómo crees que son los espacios en este centro desde el punto de vista de su infraestructura y accesibilidad, su disposición y empleo?
<input type="checkbox"/>	¿Y desde el punto de vista de su disposición en el conjunto del centro, en relación con otras etapas educativas que se imparten en él?
<input type="checkbox"/>	¿Y por su dotación de mobiliario y otros recursos, como espacios para búsqueda de información, de trabajo en equipo, de acceso a Internet, etc.?
<input type="checkbox"/>	¿Crees que sobra algún espacio en el centro, por innecesario, en el sentido de que no aporte nada al objeto de este centro, o porque realmente no se use?
<input type="checkbox"/>	¿Crees que falta algún espacio que sería realmente útil y necesario en la FP para la mejora del proceso de enseñanza y la mejora en la adquisición de aprendizajes, habilidades y hábitos?
<input type="checkbox"/>	¿Cuál o cuáles te parecen los espacios más importantes para esta etapa educativa, según sus objetivos?
<input type="checkbox"/>	¿Cómo mejorarías el uso de algún o algunos espacios que te parezcan interesantes y no se usen normalmente?