

**Graphic representation based on the use of a cartographic map
and leisure pedagogy. Design of the teaching innovation
project "OCIGraf 2D"**

**Representación gráfica a partir del uso del plano cartográfico y la
pedagogía del ocio. Diseño del proyecto de innovación
docente "OCIGraf 2D"**

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Abstract

The present paper presents the design of a teaching innovation project called "OCIGraf 2D". This project sought to introduce students to the basic principles of graphic representation (two-dimensional) based on a teaching proposal in which the symbiosis "cartographic plane - leisure pedagogy" is used as a teaching-learning tool. The objective is to motivate and reinvigorate highly reluctant students to acquire basic knowledge, mainly theoretical, regarding the subject of "Technical Drawing" (Graphic Expression area) through an innovative proposal inspiring active and participatory education with the public. Through this, it was sought to encourage curiosity based on practice and action-research (participation). Outcomes produced from the pilot study point to improved motivation in the participating student group regarding drawing out a 2D plan. This is evidenced by the fact that students reported learning to be practical for their daily life.

Keywords: Motivated Students, Creativity, Cartography, Graphic Expression, Territorial Management, Educational Innovation, Leisure

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Resumen

En este trabajo se presenta el diseño de un proyecto de innovación docente, denominado con el acrónimo "OCIGraf 2D", que versa sobre la introducción del alumnado a los principios básicos de la representación gráfica (bidimensional), a partir de una propuesta docente en la que se utiliza como herramienta de enseñanza-aprendizaje la simbiosis "plano cartográfico - pedagogía del ocio". El objetivo es motivar y recuperar al discente más remiso a la adquisición de conocimientos básicos, principalmente teóricos, de la materia de "Dibujo Técnico" (área de Expresión Gráfica) mediante una propuesta innovadora que genere una educación ciudadana activa y participativa. De cara a fomentar la curiosidad, a partir de la práctica y la investigación-acción (participación). Los resultados obtenidos del estudio piloto apuntan a una mejora de la motivación del grupo de estudiantes en relación a la representación de un plano 2D, evidenciada en que el alumnado pone de manifiesto que lo aprendido les resulta práctico de cara a su día a día.

Palabras clave: Alumnado Motivado, Creatividad, Cartografía, Expresión Gráfica, Gestión del Territorio, Innovación Docente, Ocio

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Summary: 1. Contextualization (research framework). 1.1 Starting hypothesis and general aim. 2. Teaching innovation in technical drawing (graphic expression). 3. Design of the teaching proposal (OCIGraf 2D project). 3.1 Cartographic plans as a didactic resource. 3.2 What can leisure pedagogy contribute? 4. Classroom teaching methodology. 4.1. Description of the intervention proposal. 5. Case study: Technical drawing, from secondary education to higher education. 5.1 Student perceptions (first impressions). 6. Final considerations. References.

1. Contextualization (research framework)

Design of the "OCIGraf 2D" project forms part of the line of research "New (alternative) Methodologies for the Teaching-Learning of Design/Technical Drawing", in which design, architecture, engineering and BBA professionals work together in an interdisciplinary way. In this way, an introspective view is taken of teaching practice, in which it is interrelated with the STEAM philosophy (González-Yebra et al., 2020; Pérez-Valero & González-Yebra, 2021). The teaching-learning process pertaining to technical drawing (graphic expression) is challenging as this subject stands out from others as causing the most difficulties for students. One of the main reasons for this is lack of practice and spatial skills (Prieto, 2008). These aspects are aggravated by a lack of motivation (Melian-Melian & Martín-Guitérrez, 2020) with teachers having a strong obligation to arouse interest in their students (Scogin, 2016). Further, the importance of leisure in the lives of students is unquestionable, given its contributions to physical, mental, and social well-being, as well as its ability to potentiate competencies that are yet to be acquired (Crespo et al., 2016; Rodrigo-Moriche et al., 2020).

Currently trends highlight a preference towards empty, passive and sterile leisure (Gomes & Elizalde, 2009). such trends will only be reversed through education. Despite this, programs currently used to tackle this issue are so specific, that they cannot be widely disseminated or applied to achieve quality leisure in the new generation. This has an impact on active aging in the context of society, culture and education (Fabris de Oliveira & Edinete, 2019; Albertos et al., 2020). Given this backdrop, a teaching proposal was developed based on the "Graphic Representation (2D) - Serious Leisure" binomial, the cornerstone of which is the use of cartography as a didactic and reflective resource to illustrate coverage and relationships (Figure 1). The use of drawing as a means to representation makes it possible to increase graphic-expressive capacity. Clarity regarding the essence of individual ideas captured on the map enables students to acquire learning regarding "reading" and the creation of cartographies that are appropriate to their experiences and needs (Davico, 2022). In this way, this innovation proposal aims to go beyond the conventional use of maps (Macaya, 2017). Beyond the simple representation of territory covered, such maps aim for students to be able to create connections between concepts and ideas, inviting self-reflection on their learning as inhabitants (Zuñiga-Villalobos, 2023) and promoting serious and quality leisure engagement.

1.1. Starting hypothesis and general aim

There is a lack of motivation towards understanding the basic contents of graphic representation. The "OCIGraf 2D" project was, therefore, based on the hypothesis that the proposed teaching approach (i.e., Cartographic Plan & Leisure Pedagogy) would contribute towards improving motivation for acquiring technical drawing skills. Such skills have a didactic purpose, in which all students, through the use of cartographies, illustrate the activities they usually perform on a map (Figure 2). On this map, students include all the activities they currently perform, alongside new activities they aim to perform in the future due to their indispensable nature with regards to them becoming knowledgeable and critical individuals and, as a result, lead an active life within their environment (Maroñas-Bermúdez, 2019).

Thus, the general aim of the innovative proposal described in the present research is to improve motivation and education pertaining to citizenship in students undertaking the fourth year of compulsory secondary education to support learning regarding technical drawing. These individuals represent potential future professionals in the fields of architecture and engineering. In this context, the classroom serves as a 2D graphic representation laboratory in constant movement with everyday life.

2. Teaching innovation in technical drawing (graphic expression)

Regardless of its form, drawing is the main resource for organizing and expressing thoughts and visual perceptions (Ching & Juroszek, 2002; Arnheim, 2005). It is understood not only as a practical tool but also as a form of artistic expression (Gómez-Molina et al., 2003). Thus, technical or design drawing is understood as something more than a technical representation, it helps to know and interpret space and its order, to provide graphic indications used to produce a project (Ching, 2002). In order to achieve this, Prieto and Velasco (2006) indicate that it is necessary to detect the challenges to learning faced by students in relation to this subject, and, in this way, determine the most appropriate educational innovation intervention. Graphic language must be conditioned by the tools and support available, given that, at its heart, it presents the progress of civilization (Aguilar-Camacho, 2006). It must also not be forgotten that graphic representations allow, not only, space and style to be defined but, also, the sensitivity of time through the "reading" of constructive schemes (Pla i Masmiquel, 2009).

It is important to understand that the didactic experience should be approached from a global perspective, incorporating multidisciplinary creative processes and adapted graphic expression resources (Sanchis-Gisbert & Peris-Blat, 2019). This converts design and graphic expression into a field of interest, both at a formative and a social level, regarding teaching innovation (Monolucos & Vazquez, 2014; Gutiérrez-González, 2018), lending it open to both reflection and

criticism during the graphic-artistic process (Habegger-Lardoeyt, 2008; Raposo-Grau, 2014; Escurra & Rosso, 2020). An example of this comes from the Flipped Classroom methodology, which has begun to be applied in the subject of "Graphic Expression", with the purpose of increasing student motivation (Escudero-Fernández, 2020; Escudero-Fernández, 2021). Another teaching innovation proposal, this time in the ambit of "Computer Aided Design", comes in the shape of b-learning supported by 3D Immersive Environments (González-Yebra et al., 2018). All these above examples of creativity serve to enhance divergent and flexible thinking, seeking convergence between interpretation and innovation with regards to the graphic language used (Stein & Harper, 2021; Perales-Blanco, 2010).

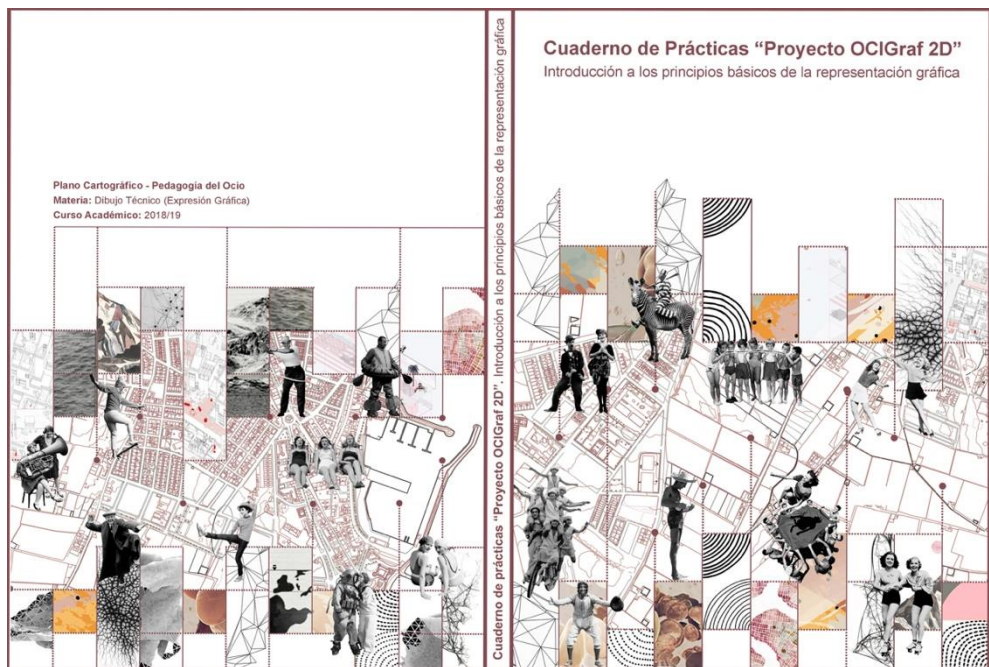


Figure 1. Front and back cover of the workbook prepared specifically for the development of the academic activities outlined by the OCIGraf 2D project

Note: Digital montage made for the front and back cover of the practice booklet produced for the OCIGraf 2D project. This outlines the process methodology adapted as an approach for working with cartographic maps as a didactic resource.



Figure 2. Base plan used for some of the academic activities developed within the framework of the teaching innovation project

Note: An example of the base plans produced for the realization of exercises conducted in the classroom is presented. The example comes from a case study conducted in Almeria (Spain). The image has been produced by the computer-aided design software AutoCAD®.

3. Design of the teaching proposal (OCIGraf 2D project)

2.1. Cartographic plans as a didactic resource

Early approaches to social cartography, defined by Habegger and Mancila (2005) as the science behind the procedures used to obtain data on the layout of territory for its subsequent technical and artistic representation, aimed to provide students with a new means of expression in their education. This enabled a visual methodology of social, pedagogical and artistic research (Ramon & Alonso-Sanz, 2022), which would allow them to understand the territory they inhabit (Barragán-Giraldo, 2016) and uncover the barriers preventing them from becoming proactive inhabitants, followed by the communication, dissemination and promotion of the improvements considered to be appropriate (Pinel & Urie, 2017). It can, therefore, be seen that the knowledge given by technical and experiential instruments of a determined territory serves as a tool for planning its subsequent transformation (Figure 3).

3.2. What can leisure pedagogy contribute?

The importance of leisure and its physical, mental and social contributions is unquestionable (Castillo-Cedeño et al., 2014). There is a growing trend towards "bad leisure" that can only be corrected through education delivered by educational institutions (Caballo et al., 2012). The aim of the present study was to implement a didactic proposal targeting 'serious leisure', within a technical drawing framework, using a cartographic map as a resource to represent territory and the way in which individuals relate to it.

4. Classroom teaching methodology

The methodology was group-centered, active, and participatory in nature. Processes were followed that allowed self-reflection and engagement (Caballero-Ferrándiz et al., 2019), offering dynamism and effectiveness. It has been demonstrated that students can acquire conceptual, attitudinal and procedural competencies through reflective activities and debates carried out in the

classroom, whilst individual and group work activates their creativity, fantasy and imagination (Munari, 2018). In addition, the intrinsic practical nature of the approach means it can be applied to many different areas. In this way, through field trips and exercises, together with other areas of knowledge, the experience manages to transcend the classroom. This triggers an increase in motivation and, consequently, student involvement in the learning process. At the same time, material presented in the "Good Leisure Manual" (Cuenca-Cabeza, 1995, 2004) has been transversally included in pertinent work, highlighting research on the subject (Urpí-Quercia, 2005; Luis-Gómez, 1988), with the purpose of leading students to understand the territory. This creates a link that makes students participants in their own training through social, ethical, and inclusive commitment to the teaching-learning process (Cabrera-Cuadros et al., 2021).

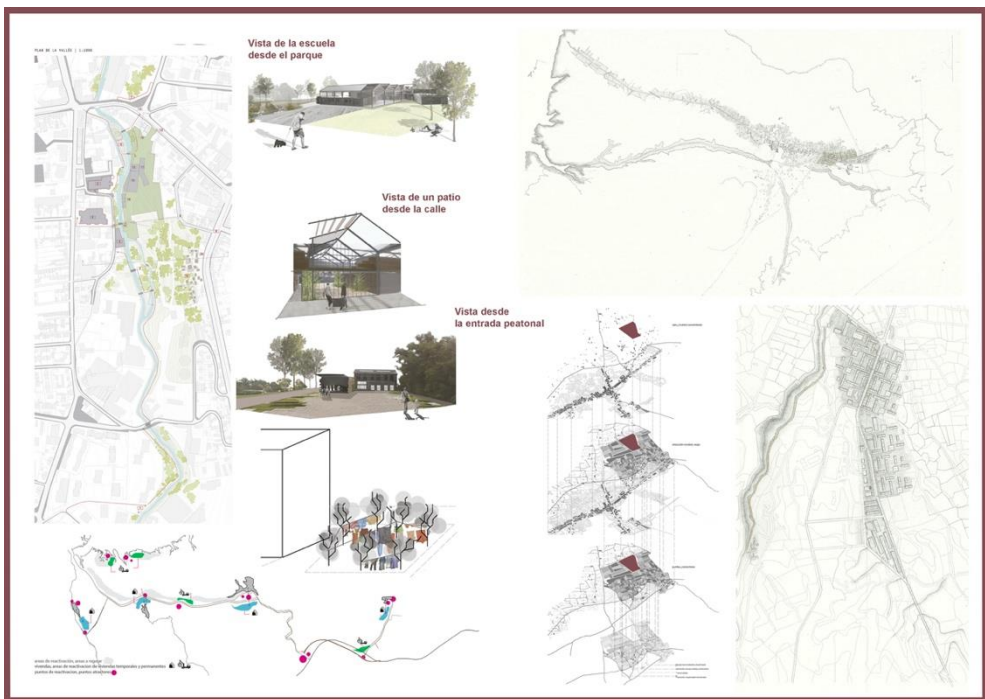


Figure 3. Design of personal cartography as a reference and case study for the implementation of the new teaching proposal

Note: Personal cartography designed as a graphic reference for the different sessions delivered as part of a creative workshop. A combination of several design tools (AutoCAD® and Adobe Photoshop®) was used to prepare project material.

With regards to the practical aspect, lectures were organized sequentially and briefly, using examples that were familiar to students and their daily lives. This allowed students to assimilate and understand the usefulness of theory as something not alien, reinforcing their interest in acquiring information and skills from a qualitative point of view (Fernández-Navas et al., 2020). In this context, learners are encouraged to share reflections and research with the rest of the class, in order to learn from each other in a participatory and collaborative way (Rodríguez-Casado & Rebolledo-Gómez, 2017). Giving students a voice improves their expressive techniques, information acquisition and maturity, whilst also achieving an atmosphere characterized by the type of dialogue and discussion inherent to critical and reflective reasoning (Cánovas-Marmo, 2015). It cannot be forgotten that creativity is a historical-cultural and essential factor within any learning process (Roche-Cárceles, 2020), which, in this case, also serves to generate graphic representation proposals according to the given parameters and realities that motivate students. In summary, implementation of the proposal, from the exploration phase to development of the final product, requires organization, planning and effort. This contributes to achieving the objectives and competencies associated with this project. This is outlined in Figure 4, which presents an overview of the teaching approach developed. For evaluation of the final project developed by the students, work groups will be requested to conduct self-evaluations. However, all evaluations will be guided by teaching staff, providing students with a series of guidelines and criteria (Table 1).

3.1. Description of the intervention proposal

The following is a brief description of the delivery of 6 hours of content to participants May 29 and April 10, 2019. The following actions were performed with 4th year compulsory secondary education students and their application as a tool for orientation pertaining to future studies (university education) related with graphic expression were evaluated. During the planning process, the proposal was adapted to the time available, which, being quite limited, forced a reduction in the theoretical content and meant that a summary condensing the most relevant information was delivered. This summary of the syllabus was provided during the

first 20 minutes of each session during the first week of the intervention. The second part (40 minutes) of each class was devoted to a practical activity that encompassed the previously presented theoretical content. The aim of this was to address the transversal element of serious leisure through the teaching of content referring to territorial cartographic representation. Planning was shared with students during the first session so that they could participate in organizing the experience. A total of 6 sessions were delivered.

Table 1. Indicators assessed by project self-evaluation rubric

INDICATORS	W	DESCRIPTORS FOR EVALUATION				S(Σ)
		IN	IM	AD	EX	
The proposal has aesthetic and professional quality (technical and precision)	10%	The proposal does not evidence any aesthetic or professionalizing quality, abounding in clichés	The proposal is of a regular aesthetic and professionalizing quality, in need of improvement	The proposal is adequate in terms of the quality reflected in the final document submitted	The proposal is of a high aesthetic quality, similar to the current professional level in 2D graphic representation	
Achieve results congruent and up to date with the development of the environment	10%	It does not present the results of a research appropriate to the environment	Presents consistent results but with incorrect or outdated ideas and concepts	The results are acceptable but far from fully satisfactory	The results are innovative and very significant for graphic representation	
Viability of the developed project	5%	Does not propose viable initiatives in relation to the context	It has proposed possible initiatives in relation to its context but they are not entirely feasible	The feasibility of the developed project is appropriate to the context, with coherent solutions	Project reliability is developed through feasible and desirable initiatives that ensure a viable project	
Timeline and teamwork	5%	Processes and work methods are not in accordance with established procedures. Scheduled dates of interest are not met	The proposal does not systematically follow an acceptable procedure, causing occasional delays or misunderstandings	The work developed shows a high degree of interest on the part of the group, appropriate to the time of completion	The proposal follows a coherent procedure that has been previously established and discussed	
Execution of graphical representation methods	20%	Does not apply the knowledge acquired for the justification of the representation method	The execution of the methods for graphical representation is partially applied	For the representation, methods have been used that suit the purpose of the work adequately	Correctly executes the methods, thus justifying the knowledge acquired	
Expressive rigor and technical mastery of the contents studied	20%	The content studied is not appreciated and mastery of the technique is not demonstrated	The proposal reflects a low mastery of the technique, in need of improvement	Technical proficiency in rendering is adequate for the proposal but not entirely accurate	The proposal evidences a clear mastery of the contents and is rigorous in terms of the technical value of representation	
Creative and innovative contribution of the proposal with respect to the context	10%	The proposal developed has no innovative nuance, without providing any variation or novelty	Try to do something different but based on previous work, introducing some innovative element	The proposal has creative value that fits the context but lacks innovative contributions	Innovative, novel proposal, with different contributions and very original possibilities	
Clarity, cleanliness and accuracy of final rendering	20%	No obvious technical or visual qualities are evident in the final document and presentation	The proposal presents technical, visual and documentary qualities that are not very original	The final rendering shows precision in technique but lacks rigor in terms of cleanliness	The proposal, with all the accompanying extra documentation, evidences technical, visual and formal qualities of a high degree of quality	
*REMARKS					E=	

Note: IN = Inadequate (1 point), IM = Improvable (2 points), AD = Adequate (3 points), EX = Excellent (4 points), S (Σ) = Score obtained for the indicator, W = Weighting, E = Final evaluation out of 4. The rubric was completed by all students involved in each work group (50% of the final grade) and by the teacher or tutor supervising the project (50% of the final grade). Evaluation descriptors (IN, IM, AD and EX) were explained, at length, in class 30 minutes prior to completing the rubric.



Figure 4. Conceptual outline of the most important features of the proposed teaching approach

Note: Figure 4 outlines the items that make up the core of the teaching proposal, including the socio-cultural approach of the students themselves within the workflow.

In the first session, students were introduced to the subject through debates that posed the following questions: What do you spend your free time doing? What do you spend your vacations doing? Do you participate in your city's festivities and if so, which ones? What customs do you like the most? Where do you like to go for a walk? Do you have a place where you like to meditate or study? This debate generated an enriching dialogue where students expressed themselves freely, thus favouring communication with the teacher as well. A close relationship between those involved (students-teachers) is essential in this type of proposal, as it allows an open and sincere communication relationship to be established based on trust. After the introduction was provided, theory underlying cartography was discussed, and a personal cartography was provided as a reference (Figure 3). Following this, the activity to be performed during the next session was introduced.

In the second and third sessions, theoretical content was again presented, followed by completion of the exercise proposed in the previous session. Students were requested to depict their leisure time via itineraries and symbols corresponding to certain points. Through this, students illustrated their relationship with the city and where they spent their free time. The aim of this was for students to reflect on their usual engagement in activities and, also, to discover the activities engaged in by their classmates. A free drawing technique was used, although students were requested to include both a legend and a scale and other elements that had been studied during the theory part of the session. Sessions were conducted in an atmosphere of sincerity and dialogue. Student requests were given strong consideration, paying special attention to the link between their free time and the music they were listening to at that time. This generated debate about their musical hobbies and their enjoyment of leisure pertaining to this specific field. Once students had graphically depicted their leisure time, they were requested to represent their non-leisure time engagement on the same figure (Figure 2). This made it easier for students to understand that the territory in which they live can offer other opportunities outside of the realms of their knowledge, increasing their awareness and permitting future changes to their dynamics. In this phase, a free drawing technique was also used and, again,

students were asked to include milestones and new elements that had been worked on in the legend.

During the fourth and fifth sessions, students were asked to depict desired outcomes that were not a current reality, for example, more parks, more skating rinks, free concerts, and museums or classes promoted and subsidized by municipalities. The idea of this was to let their imagination run wild as much as possible and so no rules or limitations were imposed. Students were again provided with a base cartography as a reference of their environment and had previously discussed the scale required in relation to this as a function of their field of action. After this activity was completed, all cartographies were exhibited, and a debate was generated about the different and unique proposals generated for the cities (Figure 6). A free drawing technique again used, and students were asked to include their proposed actions in the legend.

In the last phase of the intervention proposal, the sixth session, projects were presented, encouraging critical appraisals feedback that considered process, content, and feasibility. This debate was designed so that the students could witness the way in which public bodies function when providing approval for a given project. With regards to role-playing, a member of the chosen faculty played the role of a municipality technician with students playing the role of architectural and engineering firm personnel who were presenting their project for a competition. This helped to generate a climate with a sense of initiative and entrepreneurship.

5. Case study: Technical drawing, from secondary education to higher education

The pilot phase of the project was delivered during a pre-pandemic academic year (2018-2019) by university teachers (technical education area) on the 4th year compulsory secondary education module "Artistic Education". Specifically, the intervention was integrated within Block 2 (Technical Drawing), whose curricular

content was the following (Rendón et al., 2004; Ching, 2013; Sánchez & Romero, 2014): (i) Proportion and scale. (ii) Compositions on a plane. (iii) Technical drawing in visual communication. (iv) Environmental applications. (v) Two-dimensional representations of architectural works, urban planning or objects and technical elements.

It was deliberately chosen to deliver sessions to students at this educational stage, so that the experience would also serve as an orientation (and knowledge) activity and encourage them to consider degrees related to the field of engineering and architecture when deciding on future studies, especially in the case of students who traditionally choose knowledge branches (Pablo-Lerchundi et al., 2014). The project adapts the educational system to the challenges of the 21st century, in light of the value of educational inclusion and application of the principles of Universal Design for Learning (Royal Decree-Law 243/2022). Likewise, prior to project implementation, the group of teachers/researchers conducted self-evaluations, in order to determine whether basic criteria for teaching innovation projects had been met. For this, the "Decalogue of an Innovative Project" outlined by the Telefónica Foundation (Educational Innovation Area, 2014) was taken as a reference. In this sense, the highest levels of innovation were obtained for the 3 criteria describing "learning experience based on challenges", "collaborative learning experience" and "learning beyond the classroom".

4.1. Student perceptions (first impressions)

In order to examine student perceptions, a questionnaire was designed using the Microsoft Forms platform, with included questions being presented in Table 2. In addition, the final design was adapted to enable completion on mobile devices. A semi-structured model was proposed, consisting of questions that were to be responded to on a 4-point Likert scale (i.e., a lot, quite a lot, fairly, regularly, not at all) or in an open-ended manner. These items collected information on the needs of the content dealt with within the OCIGraf 2D Project framework, in addition to information pertaining to delivery in the classroom (static or dynamic?).

With regards to the study sample, the course on which the project was delivered comprised 32 students, of which 18 were girls and 14 were boys. The small number of students made it possible to complete all proposed graphic-reflexive activities. Students were all "Generation Z or Centennials", making them at ease with using technologies and social media in their leisure time (Del Moral Pérez et al., 2021). However, in the case of content related to technical drawing, participating students, in general, were characterized by a lack of motivation and self-concern. It was, therefore, necessary to improve didactic processes, requiring support for students in order to influence their motivation (Prieto & Velasco, 2006).

Table 2. Perceptions (and corresponding questions) examined following experience of the project

ISSUE	EVALUATION FIELDS	VARIABLES
<i>Likert scale questions (4 points)</i>		
I. 1	How much have I learned during the experience?	[Learning]
I. 2	Degree of usefulness of what I have learned for my training and future	[Content]
I. 3	Did you like the teaching methodology used in class?	[Methodology]
I. 4	Degree of enjoyment in the development of the graphic-reflective sessions	[Activities]
<i>Open-ended questions (exploratory in nature)</i>		
I. 5	What did you like most about the teaching approach used in class?	-
I. 6	Indicate what you liked least about the proposal	-

Subsequently, data were processed using SPSS software. Analysis focused on descriptive statistics (i.e., mean and standard deviation) in order to identify strengths and weaknesses. In this regard, in relation to question 1 (learning variable), as can be seen in Figure 5, 90% of students considered that they had learned a lot or quite a lot during the experience, compared with the remaining 10% who did not consider learning to be so good (regular response). None of the students in the group concluded that they had learned nothing, which indicates success in terms of knowledge transmission. On the other hand, 55% (Figure 5a) considered the content (question 2) learned to be fundamental for their daily lives, whilst 45% (Figure 5b) considered the proposal to be quite necessary, i.e., the entire group of students valued the teaching proposal with nobody considering it not necessary (fairly or not at all). With regards to question 3 (methodology variable), 92% of participants liked the work process a lot or quite a lot, whilst 8% were not satisfied. Finally, with regards to question 4 (activities variable), 100% of participants reported having enjoyed classes while learning. This indicates success since lack of motivation towards the subject was identified as the main problem. It should also be noted that managing to capture student interest was the greatest challenge faced by this project.

In the qualitative evaluation block, the questionnaire included two open-ended questions (exploratory in nature) with the purpose of comparing the trends produced with those indicated through quantitative responses (Likert). A detailed analysis was made of the transcripts pertaining to student responses. This analysis suggested that the proposal had awakened student interest learn more about cartographic maps. Some of the most representative responses provided are presented below. In reference to question 5 (what students liked about the proposal): (i) "It was interesting to see the usefulness of the maps, I didn't know they were useful for so many things", (ii) "I liked being able to design the facilities needed in my city", (iii) "I liked sharing with the class the activities I usually do and knowing what the rest do". Lastly, in relation to question 6 (what they did not like, i.e., possible limitations), one response, "Not having had more time to complete our group project designing proposals for the city, we had many more ideas", was

repeated several times. This being said, timing was planned by the training centers and not by OCIGraf 2D project teachers.

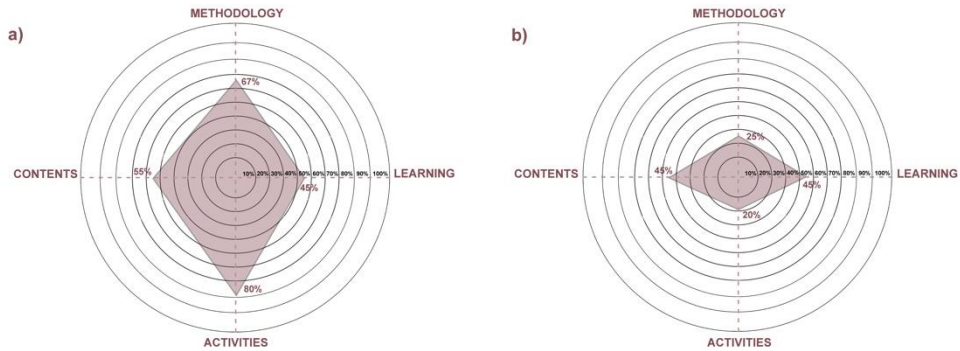


Figure 5. Post-test outcomes referring to student evaluations of the teaching proposal

Note: Results obtained for the response options "very much" (a) and "quite a lot" (b), in relation to the 4 variables tested during project delivery (methodology, learning, activities and content) are shown. It should be noted that the other two response options (corresponding to "regular" and "not at all") are not represented here, despite being discussed in the text, because no student responded "not at all", whilst only two variables were rated as being "regular".

6. Final considerations

Following project implementation, pilot study outcomes evaluating delivery of a teaching proposal with a view to informing future research point to the fact that the approach improves student motivation, transforming students into active members of the educational process who are critical of their environment. Innovation proposals for the teaching of graphic expression have been developed throughout the last decade, as shown by numerous indexed publications and doctoral theses. The present work does not intend to evaluate skills pertaining to a specific software, but the ability of students to adapt to a new training methodology. Thus, the present project is in line with the objectives defined by the subject in that it concerns an approach that increased interest by opening up new opportunities over and above those found in the traditional teaching-learning of 2D representation (Figure 6).



Figure 6. Selection of some of the work performed by students as part of graphic-creative workshops delivered by the "OCIGraf 2D" project

Note: Teaching proposal outcomes showing the different legends elaborated by students at the time of producing territory recognition maps. Subfigure a) presents a proposal for a cinema, a bullring, a soccer field and a drinking area, amongst other aspects. Subfigures b) and d) represent a residential and commercial area equipped with different services. Subfigure c) presents the representation of a bowling alley. All examples correspond to a 2D plane showing length and width, generating images of two-dimensional models on which the cartography is produced as a representation of the real world, adding semantic value to the results.

This cognitive ability, by gathering data on lived experiences, improves visual perception, increasing student awareness of their relationship with the environment and their understanding of space as part of their thinking. Finally, although present outcomes are promising they are time limited. Thus, collaborative and informative networks are required to disseminate the proposal and propose new actions, in order to reach a broader audience and include all interested parties (students, teachers and training centers). Likewise, the teaching approach should be extended to university level to increase the scope of addressing skills pertaining to technical drawing. This will be of particular interest in modules related to "Graphic Expression" on early degree courses in the fields of engineering and architecture.

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