

# INFOGRAPHICS AS AN INSTRUMENT OF CONTINUOUS EVALUATION: A PROPOSAL FROM THE EXPERIENCE OF USING THE TOOL AS A GROUP PRACTICAL ACTIVITY

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## Abstract

An infographic is a visual representation in which complex ideas are expressed through a combination of elements (illustrations, diagrams, maps, graphics, tables, etc.), with the aim of making them understandable. Infographics are present in newspapers, magazines, ads, newsletters, etc. but in university teaching they offer interesting didactic possibilities. There is ample evidence about the fact that infographics have turned out to be an adequate strategy to have a global vision of the degree of assimilation of content by the students. And in addition, infographics favour the development of technological skills and creativity as key competences in students' development.

To the extent that this communication raises infographics as a group work and therefore favours cooperative learning (linked, in turn, to the cognitive level of creativity) the objective is to propose the use of infographics as a tool for the continuous evaluation of students. Its use is proposed at the end of each of the thematic units of a certain subject. In this way, a double follow-up can be done: the degree of knowledge acquisition and the level of development of competencies linked to creativity and technological skills.

Thus, from the characteristics of the commented subject itself, of the experience in the use of infographics in said subject and the results of said experience, a rubric is also proposed for the correction of infographics, which provides immediate feedback to students in order to favour their learning and the development of the commented skills. The proposal is developed within the frame of the "Infographics project applied to university teaching", from the Institute of Educational Sciences (ICE) of the Polytechnic University of Valencia (UPV).

Keywords: infographics, evaluation, teaching innovation, assessment, rubric, creativity.

## 1 INTRODUCTION

Several decades ago, Tufte [1] defined the characteristics that all graphic information display should comply with:

- Show the data.
- Induce the viewer to think about the contents.
- Avoid distortion of the message that the data transmits.
- Present many data in a small space.
- Show large data sets in a coherent way.
- Encourage to compare these data.
- Reveal data at various levels of detail.
- Fulfill a clear objective.
- Integrate verbal data and descriptions closely.

In recent years, thanks to the role of new technological developments, graphic representation techniques through tools such as infographics, have evolved, progressively, as one of the main tools for mass media. This thanks to their ability to facilitate access to information in times of limited and distracted perception [2].

In the sense described, infographics can be defined as a synthetic and visual interpretation of complex information stated by icons, graphics and typography, resolved by creative and direct decoding. Thus the infographic is presented as a very visual, attractive, didactic, dynamic and easy visualization tool. It

has great utility, because it contains complex content, in diagrams that follow the social visual codes today and can provide an applicable service to many disciplines [3].

Among these disciplines, infographics are especially relevant in the field of university education. For Carretero [2] teaching from a visual learning point of view based on infographic as a tool, goes through changing from the casual to intentional, combining a way of thinking, of knowledge, which is ethical, aesthetics and practice at the same time. And that can help us all, teachers and students, to display a critical cultural imaginary with our present.

In the context of the teaching innovation project in which this work is framed (see section of Acknowledgements) has been proven that infographics have turned out to be an adequate and rich strategy, to have a global and unitary vision of content integration by the students, regarding the subject that is being taught, at the same time of reproducing creative visual languages, which activate motivation [4]. It has also been proven that students positively value the use of infographics to transmit complex messages with great synthesis capacity; that is a tool that helps them incorporate transverse skills such as practical and critical thinking; and the efficiency of visual language and the perception of tool utility are also confirmed [5].

But in addition to creativity, practical and critical thinking or the acquisition of technological skills [6], another of the transversal skills that have tried to enhance with the use of infographics within the framework of the aforementioned teaching innovation project, is the teamwork skill [7]. For this, a pilot experience was carried out, introducing the elaboration of an infographic as one of the group practical activities of one of the subjects included in the project. From that pilot experience it could be concluded “that the students enjoyed designing infographics, discussing their content and valuing their potential for other works. In addition, to reinforce group work, in the next session the professor brought printed infographics and hung in the classroom, so that not only the rest of the course students could see them, but also, they could be shared with students from other courses” [7].

After that positive experience, what is proposed in this work, is the expansion of that pilot project to the complete course, introducing the elaboration of group infographics in each thematic unit. Thus, this communication raises infographics as a group work that favours cooperative learning (linked, in turn, to the cognitive level of creativity) and as a learning tool whose continuous evaluation during the course allows to assess two main aspects of the learning process: the degree of subject specific knowledge acquisition and the level of development of competencies linked to creativity and technological skills.

## **2 METHODOLOGY**

### **2.1 Background**

The pilot experience mentioned at the Introduction section, was carried out at the end of the 2021-2022 course, in the subject "Strategic Management of Public Organizations". The subject had about 60 students, although in the session in which the activity was raised the attendees were about 50. First, they were explained what an infographic consists of, what they are used and how they can be done through some examples. For the creation of infographics, we proposed different open software tools (or with demo period) that provide templates that can help them, such as Piktochart (<https://piktochart.com/formats/infographics/>), Easel.ly (<https://www.aesel.ly/>), or Canva ([https://www.canva.com/es\\_es/](https://www.canva.com/es_es/)), among others.

At the beginning of the session, we provide students with different sources of information related to the content or topic on which the infographic should be made (the issue was mobility, see example in Figure 1). Then, each group (8 groups with about 6-7 students) had to develop an infographic with a specific mobility objective, taking into account:

- 1 What was the specific objective to communicate.
- 2 Who would the infographic be directed: the target audience.
- 3 What message they wanted to transmit.
- 4 How the results would be evaluated.



Figure 1. Example of infographic elaborated in the pilot experience.  
Source: Students from the Strategic Management course, 2021-2022.

Given the good results of the experience (commented above) the possibility of introducing infographics as one of the subject evaluation items was raised. The approach would be that at the end of each unit, the work teams defined at the beginning of the course, would perform a group infographic that collects the fundamental aspects of the reviewed unit. Given the impossibility of applying this change for the 2022-2023 course, due the difficulty of modifying the teaching guide of the subject, this change was chosen for the 2022-2024 course. Thus, what has been planned for the 2022-2023 course is to expand the pilot experience by introducing the infographic as a deliverable in several of the 12 group practical activities scheduled during the course. In this way, the good results obtained in the pilot experience may be confirmed (or not) before making a relevant change in the criteria for evaluation of the subject.

It should be noted that according to the current programming of the subject, the experience is not applicable to all practical activities, since in some cases these activities are carried out through group dynamics whose design makes students difficult to develop infographics. For example, there is an activity that is basically outside the classroom. Table 1 shows the programming of sessions of the subject and the activities in which the deliverable is an infographic.

Table 1. Practical activities and deliverables by unit in Strategic Management course 2022-2023. Own elaboration.

<i>Unit</i>	<i>Practical activities</i>	<i>Deliverables</i>
1. Public-private collaboration	<ul style="list-style-type: none"> <li>• Taxis vs. VTC</li> <li>• Third sector role</li> </ul>	<ul style="list-style-type: none"> <li>• Infographic</li> <li>• Lego construction</li> </ul>
2. Basics of Strategic Management	<ul style="list-style-type: none"> <li>• Redefining a public service</li> <li>• Museums and Covid-19</li> </ul>	<ul style="list-style-type: none"> <li>• Infographic</li> <li>• Mind map</li> </ul>
3. Leadership in Public Administration	<ul style="list-style-type: none"> <li>• Expert speech</li> <li>• Public manager responsibilities</li> </ul>	<ul style="list-style-type: none"> <li>• Infographic</li> <li>• Interview</li> </ul>
4. Taking decisions and communication	<ul style="list-style-type: none"> <li>• Activity outside classroom</li> <li>• Solving management problems in a library</li> </ul>	<ul style="list-style-type: none"> <li>• Report</li> <li>• Infographic</li> </ul>
5. Monitoring and evaluation	<ul style="list-style-type: none"> <li>• Managing nuclear energy waste</li> <li>• Monitoring a public service</li> </ul>	<ul style="list-style-type: none"> <li>• Stakeholders map</li> <li>• Infographic</li> </ul>
6. Governance and Public Management in 21th century	<ul style="list-style-type: none"> <li>• New public service</li> <li>• Public innovation</li> </ul>	<ul style="list-style-type: none"> <li>• Infographic</li> <li>• Canvas</li> </ul>

As can be seen, the delivery of 6 infographics throughout the course is planned, including at least one in each thematic unit. The practical sessions have a duration of 2 hours and during the first one the scheme of the pilot experience will be repeated, explaining to the students the essential aspects of the elaboration of infographics. Since the number of students in the subject during the 2022-2023 course is similar to that of last year, with 59 students, the development of the sessions is expected to be similar.

## 2.2 Infographics evaluation

After the implementation of the Bologna Plan, the university degrees evaluation system turned towards continuous evaluation models. In this way, the subject of the innovation proposed in this work has an evaluation system in which 40% of the final grade is evaluated through practical activities carried out throughout the course. This system allows us to verify how the students integrate the different skills that it is expected they should develop thanks to the subject. We know that among the different evaluation instruments that we can use to evaluate the development of transversal skills, the rubrics are presented to us as the most recommended alternative by specialists in the field [8], [9]. Therefore, considering that through the proposal made in this work, infographics are integrated as one of the evaluable items within that continuous evaluation scheme, it was observed, in the context of the teaching innovation project, the need to propose the design of a rubric, which served as a tool for evaluation and self-assessment.

One way to evaluate complex learning products is through the use of rubrics. The rubric, shortly, is a matrix that consists of graduated criteria whose function is to integrate the entire product or performance while giving particular measures of the elements or items that compose it [10].

## 3 PROPOSAL

The bibliography on the use of rubrics for the evaluation of infographics is relatively scarce. Despite this, the few existing research underlines key elements that determine the quality of infographics, such as: format, diagramming, quality of images, as well as the information and the way in which knowledge in infographic is expressed [10]. Taking these aspects into account, the objectives of the teaching innovation project in which this proposal is integrated and the concrete objectives of the same, the use of the rubric presented in Table 2 is planned.

Table 2. Rubric for infographics evaluation. Source: Carabal et al. [11]

CRITERIA	ACHIEVEMENT LEVEL				SCORE
<b>1. CONTENT SELECTION</b>	<b>Excellent 10-9</b>	<b>Good 8-7</b>	<b>Pass 6-5</b>	<b>Fail 4</b>	<b>40%</b>
Clear structure. Coherence.	The paradigm is identified and the contents are consistent.	The focus of the paradigm is identified, but not the adjacent aspects.	Acceptable comprehension errors. Some aspects of the structure are identified.	Serious comprehension errors. Does not identify the structure.	
<b>2. FORMAT AND STRUCTURE</b>	<b>Excellent 10-9</b>	<b>Good 8-7</b>	<b>Pass 6-5</b>	<b>Fail 4</b>	<b>15%</b>
The steps are described. It is hierarchized. Different sizes of letter. Minimum structure: 1. Title and subtitle 2. Development 3. Adjacent Data	A coherent hierarchy is established. The entire content is represented.	A coherent hierarchy is established. Part of the content is represented.	An incoherent hierarchy is established.	No hierarchy is established.	
<b>3. SYNTHESIS</b>	<b>Excellent 10-9</b>	<b>Good 8-7</b>	<b>Pass 6-5</b>	<b>Fail 4</b>	<b>15%</b>
Concepts are synthesized, generating visual language.	The text and image are balanced. The image represents around 60%.	The text and image are balanced, but the image represents less than 40%.	Too much text, but the image is present at 25%	Excess text. Image less than 25%. Or excess of synthesis: image without text correspondence.	
<b>4. TRANSMISSION EFFICIENCY</b>	<b>Excellent 10-9</b>	<b>Good 8-7</b>	<b>Pass 6-5</b>	<b>Fail 4</b>	<b>10%</b>
Clarity of the message. Absence or presence of errata.	In itself the infographic is able to transmit a clear message. It does not present any errata.	In itself the infographic is able to transmit a clear message. Mild typographic errors.	Mild repetitive typographic errata. Mild spelling errata.	Typographic or spelling serious errata.	
<b>5. READING</b>	<b>Excellent 10-9</b>	<b>Good 8-7</b>	<b>Pass 6-5</b>	<b>Fail 4</b>	<b>10%</b>
Reading is understandable in a single view. The hierarchy translates into a quick reading.	There is a visual balance, which allows a reading of the main scheme in a view.	There is a visual balance, but does not allow a reading of the main scheme in a view.	There is a visual imbalance, which makes reading difficult.	There is a visual imbalance, which translates into an absence of reading.	
<b>6. PERSONAL REFLECTION</b>	<b>Excellent 10-9</b>	<b>Good 8-7</b>	<b>Pass 6-5</b>	<b>Fail 4</b>	<b>5%</b>
Conclusions, tips, basic ideas, etc. that reinforce the contents are added.	The conclusions frame the infographics perfectly. Personal contributions appear.	There are conclusions although there is no personal contribution.	The conclusions are vague or incoherent. They do not provide relevant information.	There are no conclusions or personal contributions.	
<b>7. BIBLIOGRAPHY</b>	<b>Excellent 10-9</b>	<b>Good 8-7</b>	<b>Pass 6-5</b>	<b>Fail 4</b>	<b>5%</b>
Documentary sources are referenced.	Correct bibliographic quotes. More than 5 sources are selected and presented in alphabetical order.	Correct bibliographic quotes. Between 2 and 5 sources are selected and presented in alphabetical order.	Incorrect bibliographic quotes. 2 or less sources are selected and are not presented in alphabetical order.	Absence of bibliographic citations.	

## 4 CONCLUSIONS

The results obtained after the use of infographics in different experiences, including the pilot experience that serves as a basis for this communication, are related to action and expression, given that communication, both visual and verbal, has worked in a diversified way. This not only promotes individual work, but the development of cooperative methodologies has been activated, through discussion and debate.

It is important to emphasize that visual work generates an attractive perception and forces them to delve into the subjects worked, to help them understand concepts and to be able to represent them with a single view, as graphic way possible. Among them and they have generated a formative fabric, thanks to the visual schemes represented and exposed. With this, we consider that the results obtained in the pilot experience will be extrapolated to the planning carried out for this 2022-2023 course and especially for the next 2023-2024 course, when we hope to integrate infographics as one of the specific items of the subject evaluation system. In order to properly evaluate these experiences, a rubric has been proposed that includes the fundamental aspects of the infographic elaboration process according to the objectives set.

We hope to present specific results of these experiences in future editions of this Conference.

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