



# The Tragedy of the Commons: A Fresh Look from EcoComics

Teaching economics to “digital native” students could benefit from methods that align with their motivations and daily experiences, complementing traditional lectures. Popular culture, such as comics, and the widespread use of Information and Communications Technologies—especially digital presentations—are key tools in this approach. This paper describes a teaching experience combining comics and digital presentations to illustrate the management of common goods, following best practices for effective presentation design and emphasizing visual elements to enhance understanding and engagement.

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## 1. Introduction

Economics teaching, like many other disciplines, faces the challenge of capturing students' interest and attention while addressing complex concepts. Today's generations are often described as 'digital natives' (Prensky, 2001a, 2001b), having been born and raised in a digital environment. They are generally perceived as possessing a strong ability to use new technologies, preferring interactive and multimedia methods of learning and communication, and developing much of their social life through social networks. Teaching these students can represent a challenge due to their different habits and expectations, as well as their lower ability to sustain attention (Carr, 2020). Therefore, it is advisable to adopt teaching methods that complement the traditional "chalk and talk" (Becker & Watts, 1999, Becker, Watts, & Becker, 2006; Carrasco-Gallego, 2017).

The use of Information and Communications Technologies (ICTs) and, in particular, digital presentations, has become widespread in education, although sometimes without adequate reflection on their benefits and limitations (Chávez, Cladellas, & Castelló, 2020). The available evidence suggests that its effect on learning depends not on its simple use but on how it is used (Castelló, Chávez, & Cladellas, 2020). In this sense, it is important to consider the contributions of neuroscience on the factors that influence learning such as attention span, the stimulation of several senses, or the preeminence of the sense of sight (Medina, 2008). Various authors have developed a series of recommendations for effective presentations of design (e.g., Kosslyn, 2007, and Berk, 2012), who also insist on the importance of using visual elements (see also, Vazquez & Chiang, 2014).

In his *Economics Instructor's Toolbox*, Picault (2019, 2021) provides a comprehensive catalog of innovative methods for teaching economics in today's digital world. A common feature is using popular culture and media that are part of today's students' daily lives. Picault (2019) distinguishes between instructor-crafted methods (think-pair-share, classroom role-playing and experiments, flipped classroom, debates, case studies, etc.), student-crafted methods (creation of music or video, experiments, ECONSelfie, podcasts, etc.), and illustration tools. Within the latter, it presents a detailed list of employment in the teaching of press articles, podcasts, and creative arts such as literature, painting, music, cinema, video games, or comics. In particular, comics can simplify complex concepts and keep students engaged, which significantly improves comprehension and retention of the material taught (e.g., Klein & Bauman, 2010, 2012).

Based on this evidence, I present a teaching experience that illustrates the instructive power of comics in a digital presentation to explain the management of commons at an introductory level. The design of the presentation follows key recommendations from the literature on effective teaching (e.g., Kosslyn, 2007; Berk, 2012; Svinicki & McKeachie, 2014), particularly the use of visual elements with minimal text, and the integration of emotionally engaging content to maintain attention and prevent disengagement. In my teaching, I use comics in two key ways: first, to directly illustrate economic concepts and situations, and second, to provide memorable analogies that help students retain core ideas. Comics can make complex topics more accessible and engage students by linking abstract principles to familiar stories and characters.

The structure of this work is as follows. Section 2 provides a literature review and rationale for the effective use of digital presentation tools like PowerPoint and the integration of comics in teaching economics. Section 3 presents an educational experience of using comics to illustrate a digital presentation on the management of common goods. Section 4 concludes.

## 2. Literature Review and Rationale

In this section, I review the literature on the advantages and disadvantages of digital presentations and explore comics as a potential teaching tool by reviewing relevant literature, highlighting examples from various disciplines, and focusing specifically on their application in Economics and Business.

### A. Digital Presentations

The use of ICTs and, in particular, digital presentations (generally, PowerPoint), has become widespread in education. To get the most out of digital presentations, it's important to consider what neuroscience tells us about how we learn. Medina (2008) presents the "12 rules" for optimizing learning, productivity, and mental health, based on the evidence provided by neuroscience. Three of those rules are of particular interest to us. Rule 6 says "We don't pay attention to boring things." In addition, people tune out after 10 minutes (e.g., Hartley & Davies, 1978), so attracting their attention again requires telling stories or creating events that are rich in emotion.<sup>1</sup> Rule 9 is to "Stimulate more than one sense at a time," since our brain learns best when information is presented in a multisensory way. Therefore, in a presentation, you should try to stimulate your eyes as well as your hearing. Rule 10 states that "Vision triumphs over all other senses," since images are processed more quickly and remembered better than words. Therefore, using appropriate visuals can significantly increase the effectiveness of communication and learning.

As Kosslyn (2007) points out, an effective presentation must achieve three objectives: 1) connect with the audience, 2) direct and maintain attention, and 3) promote comprehension and memory. To this end, taking into account the scientific evidence on perception, memory, and cognition, he proposes eight basic principles for creating presentations: 1) relevance of the content, 2) appropriate, prior knowledge of the relevant concepts, 3) enhancement, since attention is directed towards perceptible differences, 4) differentiation, so that differences can be distinguished, 5) perceptual organization, since we automatically group elements into units, which we then remember, 6) compatibility, between form and meaning, 7) informational changes, since we expect changes in properties to transmit information, and 8) limited capacity, since we do not understand messages if too much information must be retained and processed to do so. Going into more concrete aspects, Berk (2012) lists ten basic principles for the design of effective presentations that include the use of simple solid color backgrounds, large and legible font, high contrast colors, short and concise text, high quality and relevant images, clear and easy to understand graphics and diagrams, minimal use of animations and transitions, consistency of presentation, logical and coherent structure, and previous practice (see also, Svinicki & McKeachie, 2014, Table 17.8).

Vazquez & Chiang (2014) and Roberts (2017) also make strong arguments in favor of employing visuals in a presentation. Visual elements play an important role in illustrating economic concepts, making complex theories more accessible by providing clear, intuitive representations that simplify understanding. Additionally, visuals can create memorable material, promoting information retention by engaging students' visual memory, which is more effective than text alone. Vazquez & Chiang (2014) also provide a few recommendations for slide design such as the proper selection of images, avoiding "bleeding," placing objects and text at points of visual focus, and employing text sparingly, highlighting only keywords and seeking support

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<sup>1</sup> It should be noted that Wilson and Korn's (2007) review finds little support for the general validity of the 10-15-minutes attention span rule. They suggest that various factors related to the student, instructor, content, and environment can significantly impact attention, leading to substantial differences across individuals.

from visual elements. In the teaching experience described in Section 3, I have followed the former recommendations for the design of the digital presentation.

## B. Teaching with Comics

Comics have proven to be an effective tool in teaching due to their ability to simplify complex concepts, increase students' motivation, and improve their attention using attractive visual narratives connected to their life experiences (Rivo-López et al., 2022). As a result, comics meet many of the criteria for good digital presentations. For this reason, they have been used to complement traditional methods in numerous university disciplines such as anatomy (Grachan & Quinn, 2021), physics (Kakalios, 2005, Fitzgerald, 2018), law (Giddens, 2012), engineering (Kakalios, 2019), pharmacy (Muzumdar, 2016), medicine (Green & Myers, 2010) or sociology (Hall & Lucal, 1999).<sup>2</sup>

Teaching economics and business has embraced this trend as well, increasingly incorporating comics as an educational tool. Lawson (2006) uses comic strips to teach economic principles. Gerde & Foster (2008) use the narrative of the X-Men to illustrate ethical dilemmas and business decisions, providing an occasion to discuss ethics in business and economics. Short & Reeves (2009) and Short, Randolph-Seng, & McKenny (2013) argue that the narrative approach of the graphic novel is an attractive medium for teaching business communication, which brings three key benefits: a more effective visual representation of management and business concepts, more current and relatable content for current generations, and greater interaction with students, allowing them to maintain their limited attention span. Klein & Bauman (2010, 2012) use the comic book format to present an introduction to microeconomics and macroeconomics comprehensively, making them more accessible and attractive to students. Fischbach (2015) shows that the graphic novel method is more effective than the traditional written case in the teaching of business ethics.

O'Roark (2017, 2019) and O'Roark & Salkowitz (2018) show how superhero stories can be used to illustrate economic principles such as competition, monopolies, and resource distribution. Using examples from comics and movies, characters such as Batman, Spider-Man, Superman, and Wonder Woman face dilemmas that reflect real economic situations, making these topics more relatable and interesting to students. Ferrarini (2018) draws on the comic book and television series *The Walking Dead* to explore themes such as scarcity, rational choice, or incentive structure in an ungoverned environment. O'Roark & Grant (2018) show how strategic interactions between comic book characters can be employed to teach game theory. Bose & Baugus (2020) highlight how *Amar Chitra Katha* comics (*Immortal Stories in Pictures*), based on Indian stories and mythology, can be used to teach economics in a way that connects with the cultural context of students. Rivo-López et al. (2022) and Fleck, Asmuth, & Jouflas (2024) show that the visual narrative of comics favors the development of entrepreneurial skills and initiative, and Chandra & Jin (2023) suggest that it favors the teaching and learning of social entrepreneurship and business ethics.

## 3. The Use of Comics to Illustrate the Management of the Commons

Building on the previous material, this section presents a teaching experience that shows the instructive power of comics within a digital presentation to explain the management of common goods. This lecture can be adapted to teach at different academic levels and

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<sup>2</sup> For recent references on the use of comics in education at pre-university levels see, e.g., Kirtley, Garcia, & Carlson (2020), Aman & Wallner (2022) and Smyth (2022).

in various contexts.<sup>3</sup> The novelty of the approach lies in illustrating the management of the commons through comic books, as real-world examples are more readily available elsewhere. However, focusing solely on comic examples could give the impression that real-world examples were not included. So, I have incorporated both comic book examples and also real-world scenarios that demonstrate aspects of the tragedy of the commons and Ostrom's rules about managing common goods.

Rather than using or creating comics specifically designed for teaching economics<sup>4</sup> I utilize well-known popular comics—often popularized by film adaptations. I use these comics in two distinct ways to support teaching. First, I employ them to directly illustrate economic concepts or situations, providing concrete examples that help clarify definitions or typical scenarios. Second, I create memorable analogies that make it easier to recall key ideas, even when these analogies aren't directly related to economic principles. Additionally, I share stories and anecdotes about the comics to make the experience more engaging and memorable, enhancing students' connection to the material. This approach allows students to connect complex economic concepts with stories and characters they recognize and enjoy.

In my classes, I incorporate comics by projecting them on the screen as part of the digital lesson presentation, particularly using PowerPoint. This approach builds on the ideas discussed in Section 2 about the power of visuals to engage students and clarify complex concepts. When introducing a topic, I start by outlining the economic concept or situation we are exploring, providing a real example, and then presenting the relevant comic example or memorable analogy. Typically, I will present a comic cover, but it can also be a comic strip or even a clip of a film. For instance, I might briefly explain the types of goods or the tragedy of the commons with real examples, before showing a comic cover or strip related to the topic. I present the comics gradually as I guide students through the corresponding economic ideas. This step-by-step approach ensures that students can follow along and connect the visual narrative with the concept being discussed. Importantly, there is no need for students to read the comics ahead of time as the material is accessible and can be easily understood within the context of the lesson.

To understand the problem of the management of common goods, it is necessary to know how goods are classified according to the criteria of exclusion and rivalry.<sup>5</sup> Exclusion refers to whether it is possible to exclude someone from the use of a good, while rivalry refers to

<sup>3</sup> At the University of A Coruña, the topics covered in this lecture are taught at both undergraduate and graduate levels. In the Bachelor's degree in Economics, concepts of public goods are introduced in *Intermediate Microeconomics* (second year). The management of common-pool resources, including Hardin's "tragedy of the commons" and Ostrom's institutional approaches, is covered in *Industrial Organization* (fourth year) within a module on cooperative game theory. The number of students is, approximately, 35 and 30 per section, respectively. At the graduate level, these topics are revisited in the Master in Economics, particularly in the course *Analysis of Economic and Market Decisions*, which typically enrolls around 15 students. These courses are core or elective components of the degree and master's program, rather than general education classes. This lecture has also been delivered to a group of 20 students in the course *Strategic Behavior Models*, which is taught in the sixth semester of the Bachelor's degree in Administration at the Faculty of Economic and Business Sciences of the Universidad de la República (Uruguay), to participants of the Senior University—an initiative of the University of A Coruña to offer university-level education to individuals over 55, to high school students in several secondary schools, and also to general audiences in pubs as part of the G-Night (Galician Researchers' Night) activities.

<sup>4</sup> Examples of comics developed for teaching economics are, e.g., Ishonomori (1988), Klein & Bauman (2010, 2012), Goodwin, (2012), and the New York Fed's Educational Comic Book Series. For comics that focus specifically on the management of common resources see, for instance, Zocco & Huff (2022) and Zocco et al. (2023).

<sup>5</sup> Since the objective of this paper is to describe the educational experience, the details about the problem of the management of the commons and the bibliographic references to it will be reduced to a minimum.

whether someone's use of a good reduces or prevents its availability to others. According to these criteria, economic goods can be classified into four extreme types (see Table 1): 1) private goods, excludable and rival goods (food, clothing), 2) club goods, excludable and non-rival (streaming TV, cinema), 3i) public goods, non-rival and non-excludable (defense, justice), and 4) common goods, non-excludable and rival goods (forests, pastures, fisheries).

**Table 1: Classification of Goods**

|                  |                       | <b>Rivalry</b>                              |                                            |
|------------------|-----------------------|---------------------------------------------|--------------------------------------------|
|                  |                       | <b>Rival</b>                                | <b>Non-rival</b>                           |
| <b>Exclusion</b> | <b>Excludable</b>     | <b>Private good</b><br>(food, clothing)     | <b>Club good</b><br>(streaming TV, cinema) |
|                  | <b>Non-excludable</b> | <b>Common good</b><br>(fisheries, pastures) | <b>Public good</b><br>(defense, justice)   |

Comics provide numerous examples to illustrate the different types of goods in a way that makes them easier to assimilate and remember. For example, the comic book cover with the first appearance of *The Avengers*<sup>6</sup> can be used to show private goods such as *Thor's* hammer or *Iron Man's* armor. The comic book cover with the first appearance of *The Justice League*<sup>7</sup> provides examples of private goods such as *Green Lantern's* ring or *Wonder Woman's* lasso. To illustrate the club's goods, one can show the amusement park that *Mortadelo y Filemón* goes to in one of their adventures (Ibáñez, 2003), or the registration form for the *Spider-Man* fan club that came in the comics. Examples of common goods would be the quarry from which *Obélix* extracts his menhirs (Gosciny, 1976), or the vibranium mine, a fictitious metal found in the *Black Panther* governed nation of Wakanda.<sup>8</sup> Finally, as public goods, the world defense provided by the superhero team *The Defenders*,<sup>9</sup> or the justice imparted by *Judge Dredd* can be presented.<sup>10</sup>

Hardin (1968) introduced the notion of the "tragedy of the commons" to describe the situation in which the commons are overexploited to the point of depletion because individuals act in their short-term interest and do not consider the long-term impact on the shared resource. Unfortunately, there are numerous examples of resource mismanagement and depletion in natural commons. Commonly cited cases that can be used to illustrate this situation are the deforestation of the Amazon and Indonesian Rainforests (e.g., Fearnside, 2005, Fleischman et al., 2014), and the collapse of the Atlantic cod population off the coast of Newfoundland (e.g., Hamilton & Butler, 2001). Both cases illustrate how a lack of effective governance and disregard for sustainable practices can lead to the irreversible loss of critical natural resources. Using comics, this situation can be illustrated by showing a communal meadow where farmers take their cattle to graze. As more and more cattle ranchers bring increasing numbers of cattle to the pasture, the pasture becomes scarce until it eventually runs out, leaving the land barren and leading to the extinction of livestock. A Spanish proverb that captures this situation very well is that of "*Cow of many, well milked and badly fed*," which can be illustrated with the most

<sup>6</sup> The first appearance of *The Avengers* was in Lee (September 1963a).

<sup>7</sup> *The Justice League's* first appearance was in *The Brave and the Bold* 28 (Fox, February-March 1960).

<sup>8</sup> The first appearance of vibranium occurred in Lee (February 1966). It would be in Lee (August 1966) where it was further developed as a rare mineral found in Wakanda.

<sup>9</sup> The first appearance of *The Defenders* (*Dr. Strange, Silver Surfer, Hulk, and Namor*) was in Thomas (December 1971).

<sup>10</sup> *Judge Dredd's* first appearance was in Shaw (1977).



well-known cows in the comics: *Clarabelle*,<sup>11</sup> *Bat-Cow*,<sup>12</sup> *Hell-Cow*,<sup>13</sup> and *Man-Eating Cow*.<sup>14</sup>

According to Hardin (1968), there are only two ways to avoid the tragedy of the commons: private management or public management. A comic example of private management is Obélix's quarry in *Obélix et compagnie* (Gosciny, 1976). In this story, the Roman economist Caius Preposterus, who studied at the Latin School of Economics, is sent by Caesar to weaken the Gauls by introducing capitalism and greed. Caius believes that the profit motive will make the Gauls less resistant, pointing to Roman senators as an example. He convinces Obélix that his menhirs are valuable and encourages him to produce as many as possible. Obélix manages the "menhir quarry" as a private business, even hiring other villagers to increase production. Other Gauls also start selling menhirs to Caius, who buys them at ever-increasing prices, draining the Roman treasury. To solve this, Caius promotes menhirs to Romans, leading to mass production across the empire and eventually a price crash. With the treasury in ruins, Rome stops buying menhirs, and, as always, the story ends with the Gauls defeating the Romans.

Examples of public management of common goods include regulated parking in the centers of major cities (e.g., in the City of London). An example in the comics is the case of the vibranium mine in Wakanda, a country led by the Black Panther (Subrick, 2018; The Economist, 2018).<sup>15</sup> Vibranium is a unique mineral left by a meteor that can absorb sound and motion. Wakanda maintains full control over every stage of its vibranium industry, from mining to production. It not only extracts vibranium but also uses it to create advanced technologies that strengthen its defense and keep it as a world technological leader, while the benefits reach all the population. The management of resources such as Chile's El Teniente mine is often cited as a public management success (e.g., González, Sánchez, & Castillo, 2024). However, there are unfortunately other cases where public administration of common goods led to environmental disaster. One of the most striking examples is the Aral Sea (e.g., Micklin, 2007), which was almost entirely dried up due to the diversion of its feeding rivers for large-scale cotton irrigation projects. This environmental catastrophe, which devastated local ecosystems and economies, is powerfully captured in Coixet's (2010) documentary *Aral. El mar perdido* (*Aral. The Lost Sea*).

In the film *Avengers: Infinity Wars* (Russo & Russo, 2018), Thanos provides another "solution" to the problem posed by overpopulation in a universe where natural resources are finite. To do this, he inserts the Infinity Stones into a gauntlet that channels their power and snaps his fingers to eliminate half of the universe's population. To capture the attention of the students, it can be pointed out that, in the comics, Thanos is not an "ecologist titan" but a "titan in love" with Lady Death. Mephisto suggests to Thanos that, to impress her, he must do something that lives up to his greatness. However, despite eliminating half of the living things, Thanos fails to win Lady Death's affection.<sup>16</sup>

<sup>11</sup> *Clarabelle*'s first appearance was as a non-humanized cow in the *Mickey Mouse* animated short *Plane Crazy* (Disney & Iwerks, 1928).

<sup>12</sup> *Bat-Cow* first appeared in Baltazar (2009).

<sup>13</sup> *Hellcow*, or *Bessie*, is a vampire cow whose first appearance was in Gerber (1975).

<sup>14</sup> The first appearance of *Man-Eating Cow* was in *The Thick* #7 (Bedlund, February 1990).

<sup>15</sup> Depending on the time available, more or less details of these cases could be given.

<sup>16</sup> This occurs in the first episode of the series *Infinity Gauntlet* (Starlin, July-December 1991).

Elinor Ostrom (1990) challenged Hardin's ideas, describing success stories in which local communities managed common resources sustainably over time.<sup>17</sup> In her work, Ostrom highlights several examples of long-standing, self-managed commons. Among these are the intricate irrigation systems in the orchards of Valencia, Murcia, Orihuela, and Alicante in Spain, where local water management practices, rooted in centuries-old traditions, have preserved both water resources and agricultural productivity.

Ostrom identified eight principles for the successful management of common resources. In this case, I use comics to create memorable analogies that help recast these principles. Each principle is associated with a distinct comic cover, which is chosen to provide students with a visual cue that aids in recalling both the principle and its underlying meaning. Furthermore, relevant anecdotes related to the principle's application and the associated comics are incorporated to reinforce long-term retention, connecting the material to both visual and narrative elements that engage students.

1. **Clear boundaries**, which clearly delimit the limits of the resource and who its users are. An example is the lobster fishing zones in Maine (e.g., Acheson, 2003), where specific areas are regulated. To make this principle more memorable, we can draw an analogy with superhero teams. For instance, the *Fantastic Four* maintained a stable composition over time,<sup>18</sup> much like how clear boundaries define who can access a resource. In contrast, for example, the *X-Men's* lineup has shifted so often over time that at any given moment, it can be difficult to remember exactly who is on the team. The original *X-Men* team consisted of *Professor X*, *Cyclops*, *Jean Grey (Phoenix)*, *Beast*, *Angel*, and *Iceman* (Lee, September 1963b). This variable roster continued evolving, as seen in *New X-Men*, which featured *Professor X*, *Beast*, *Cyclops*, *Emma Frost*, *Jean Grey*, and *Wolverine* (Morrison, December 2002 – July 2004). The *Ultimate X-Men* first had *Professor X*, *Beast*, *Cyclops*, *Jean Grey*, *Storm*, *Colossus*, and *Iceman* as members, but soon expanded to include *Nightcrawler*, *Kitty Pryde*, and *Rogue* (Millar, February 2001). Another example could be the ever-changing lineup of *The Avengers*, whose members have varied greatly over time.
2. **Rules adapted to local conditions**. This principle emphasizes the importance of tailoring resource management strategies to specific environmental, cultural, and social contexts. For example, the *Qanat* irrigation system in Iran, which channels groundwater from deep wells through underground tunnels to the surface, is adapted to the dry, arid conditions of the region (e.g., Khaneiki, 2019). This principle can be made more memorable by drawing an analogy to post-apocalyptic scenarios. In *The Walking Dead*<sup>19</sup> and *El Eternauta*,<sup>20</sup> survivors must adapt to drastically changed environments, such as a zombie apocalypse or an alien invasion. In these stories, the survivors establish new rules and strategies tailored to their harsh and ever-changing conditions, much like how resource management systems must be tailored to the specific needs and challenges of the local context.

<sup>17</sup> In 2009, Elinor Ostrom was the first woman to win the Nobel Prize in Economics for her analysis of economic governance; in particular, of common goods.

<sup>18</sup> The *Fantastic Four* are *Mr. Fantastic*, *the Thing*, *the Human Torch*, and *the Invisible Woman*. His first appearance was in Lee (November 1961). Although some characters such as *Namor*, *Cristal*, *Luke Cage*, or *Nova* were temporarily part of the group, they never became official members.

<sup>19</sup> The beginning of the series was Kirkman (October 1993).

<sup>20</sup> Its first publication was in Oesterheld (September 4, 1957).



3. **Collective participation in decision-making.** A real-world example of this principle can be seen in the Van Panchayats of Uttarakhand, India (e.g., Agrawal, 1996). Established in the early 20th century, these forest councils empower local communities to manage and protect their forest resources collaboratively. A memorable analogy for this principle can be found in the *Parliament of Trees* from *Swamp Thing*.<sup>21</sup> This group of ancient plant elementals embodies the “green consciousness” of the Earth. Though it doesn’t function as a real-world decision-making body, the Parliament’s symbolic gatherings, where these beings discuss matters affecting the planet’s natural state, evoke the concept of a community unified around the care of a shared resource. This image can also help students remember the importance of collective voices in resource management.
4. **Surveillance**, which is more effective if carried out by the users themselves. As a real-world example of user-driven surveillance, I would consider the mariscadoras—the clam gatherers in Galicia, Spain—who play an active role in monitoring and protecting the local shellfish beds. A memorable analogy for this principle can be found in the graphic novel *Watchmen* (Moore, 1986-1987). In this story, a group of retired superheroes, prompted by the murder of one of their own, uncovers a plot to provoke a nuclear war that would sacrifice millions. Throughout the narrative, the question, “Who watches the watchmen?” resonates as a reminder of the importance—and challenges—of monitoring, especially of those in positions of power.
5. **Gradual sanctions** for those who violate the rules, and that depend on the seriousness of the action. For a real-world example, we can look at the case of the communities of Vila-real and Borriana in Spain, which have historically applied gradual sanctions on the excessive use of water from the Mijares River (Garrido, 2011). The fines are documented in community records, and a historical analysis of these penalties helps illustrate how adaptable proportional sanctions can encourage compliance without being unduly punitive. As a memorable analogy, we could look to the comic *Injustice: Gods Among Us*, where the tragic death of Lois Lane and the destruction of Metropolis by the Joker drive Superman to become an uncompromising tyrant. This response, while intended to eradicate violence, gives an example of a disproportionate reaction that ultimately causes harm rather than protecting justice.<sup>22</sup>
6. **Fast and effective dispute resolution mechanisms.** A real-world example that aligns with this principle is the *Tribunal de las Aguas de Valencia*, a historic water court in Spain that has operated for over a thousand years (Ostrom, 1990). This tribunal meets weekly to resolve disputes among irrigators in the Horta de Valencia, addressing conflicts swiftly and effectively. As a memorable analogy, the *Judge Dredd* comics provide a vivid, if extreme, depiction of rapid dispute resolution. In this dystopian world, the judges serve as police, judges, and executioners, addressing conflicts instantly with swift judgments and immediate sanctions. Though exaggerated, this comic recalls the idea of rapid, effective conflict resolution.
7. **Recognition of their rights and authority to organize** by external authorities. *The Tribunal de las Aguas de Valencia* serves again as a strong example of this principle (Ostrom, 1990). For over a millennium, this tribunal has been officially recognized by external authorities, from the local town council to the regional government, as the legitimate

<sup>21</sup> *The Swamp Thing* first appeared in Wein (June–July 1971). Subsequently, a series of its own was published that began with Wein (1972). The *Parliament of Trees* first appeared in Moore (April 1986).

<sup>22</sup> This series begins in Taylor (March 2013).

body for resolving water disputes within the irrigation communities of the Horta de Valencia. Given its name, the superhero group *The Authority* offers a memorable analogy. As an anecdote, we can mention that leader Jack Hawksmoor underscores this responsibility, declaring (Millar, May 2000), "This has to be a world worth saving if my colleagues and I are going to be out there risking our lives on the front line."<sup>23</sup>

8. **Multiple nested levels for the management of common resources.** India's forest management exemplifies this principle of multi-layered governance (e.g., Meinzen-Dick et al., 2021). Forests are managed through a hierarchy that begins with *Van Panchayats*, local forest councils that manage smaller forest areas at the village level. This system nests within higher levels of governance, including state and national forest departments, each playing a role in conservation, regulation, and resource use. This nested structure allows for a collaborative and context-specific approach to forest management, where decisions are adapted to local needs yet coordinated across broader administrative levels. As a memorable analogy, the comic *Secret Wars II* (Shooter, July 1985-March 1986) provides an interesting parallel. In this story, diverse superhero teams like the *Avengers*, the *Fantastic Four*, the *X-Men*, and the *New Mutants* unite to confront the *Beyonder*, a global threat that none could handle alone. The memorable aspect here lies in the collaboration of groups with distinct skills and scopes, from local defenders to world-renowned teams, illustrating the idea of multiple levels coming together to manage a large-scale challenge.

Finally, the presentation can end with a motivating appeal to the responsibility that we all have in the management of common resources. To do this, one can issue the different versions of *Spider-Man's* well-known phrase: "*with great power there also comes great responsibility.*" In the *Spider-Man* movies, this sentence is said by his uncle Ben (and Peter Parker thinks it) in *Spider-Man* (Raimi, 2002), his uncle Ben (and his father, Richard, in a deleted scene) in *The Amazing Spider-Man 2* (Webb, 2014), and his Aunt May and several *Spider-Men* from the multiverse in *Spider-Man: No Way Home* (Watts, 2021). In comics, however, his first appearance occurs in a panel that says that "(...) *with great power there must also come --- great responsibility*" as Peter Parker walks away after having arrested the murderer of his uncle Ben, whom he had previously let escape after committing a robbery (Lee, August 1962).

## 4. Conclusions

This paper describes a teaching experience on the topic of the management of the commons using comics in a digital presentation. Comics offer an engaging way to present complex economic concepts and create memorable analogies, improving attention and encouraging learning for students who are "digital natives." Although no formal evaluation was carried out, the informal impression is that the reception of this experience was very positive, managing to capture and maintain attention throughout the presentations, and facilitating the assimilation of the concepts presented. The questions asked by the students did not refer only to the management of the commons but also to aspects of the comics that were used as illustrations.

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<sup>23</sup> *The Authority* made its appearance in Ellis (May 1999).

The main point that this article seeks to convey is the potential of comics as a versatile tool that can be adapted to various subjects and educational contexts. It is important to note, however, that this experience was at an introductory level. The use of comics at a more advanced level may present additional challenges in terms of implementation and effectiveness. Nonetheless, many colleagues are adopting these new methodologies with promising results, so we must remain open to their use if they prove effective in enhancing our students' attention and learning.

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