

# Integrating Economics into the Classroom through Gamification and Problem-Based Learning

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## Abstract

*The teaching of Political Economy faces challenges in integrating economic concepts and understanding collective decision-making, particularly for law and political science students. There is a gap between theory and practical application, as well as a disconnect between market dynamics and political decisions. To address these challenges, an educational innovation is proposed, incorporating dynamic methodologies, case studies, and technological tools. This approach aims to enhance the understanding of the economic impacts of government regulation and strengthen students' applied training from both economic and legal perspectives.*

**Keywords:** *Gamification; problem-based learning; economics; higher education.*

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## 1. Introduction

The course of Political Economy serves as an introduction to economics for law and political science undergraduate students. The course requires the students to learn about the mechanisms for collective decision-making as well as some basic micro and macroeconomic theory, which is critical for their development and for that reason, students need to be engaged and motivated. Both student motivation and engagement during sessions are one of the key drivers in the general achievement of students and in the satisfaction levels regarding learning experiences (Kong, 2021; Lu et al., 2014). One of the ways of fostering students' interest is through the application of teaching methods which promote teacher-student interactions (Derakhshan et al., 2021, Qureshi et al., 2023).

In that regard, this manuscript makes use of two teaching techniques which attempt to motivate students during sessions. First, the use of gamification through Wooclap. Wooclap is an online resource which allows mixing questions and problems with teaching materials. Then, the answers are used as part of the explanation. Secondly, Project Based Learning (PBL) is employed as well through a group project on market failures, which accounts for 10% of their

final grade. By combining both these techniques, this manuscript attempts to change the functioning of sessions during Political Economy course so that students can learn effectively and be motivated at the same time.

## **2. Materials and methods**

The main objective is to improve and enrich the teaching and learning processes by introducing new methodologies, technologies, pedagogical approaches, and resources that address the changing needs of students and the educational environment. To this end, various teaching innovation proposals are applied in the Political Economy course at the University of Valencia. These are divided into two groups:

First, teaching materials are designed based on slides and practical exercises that students can solve during sessions using any internet-connected device (promoting the use of digital technologies and educational resources in teaching and learning). The material will be accessible on the University of Valencia's virtual classroom through the Wooclap application. This tool not only brings dynamism to the classroom in real time but also offers a wide range of options and configurations related to learning sessions (encouraging the use of the various tools provided by the University of Valencia for both students and the teaching staff).

Second, considering the interdisciplinary nature of some of the content covered in the course, a Problem-Based Learning (PBL) method is developed, to be implemented during practical sessions. This method aims to enhance students' competency acquisition by engaging them in solving problems they may encounter in a professional environment. Additionally, it seeks to encourage students to take an active role in their learning process while raising awareness of the importance of applying a holistic perspective to resolving conflicts that integrate social, economic, and environmental aspects.

### **2.1. Gamification and New Technologies: The Value of Play in Learning**

Gamification is a strategy that transforms educational processes by adhering to key premises: the activity can be learned, user actions are measurable, and feedback is timely. Consequently, it is viable to apply it in educational activities, particularly in the Political Economy course. Gamification seeks to satisfy fundamental human needs such as recognition, reward, achievement, competence, collaboration, self-expression, and altruism through game elements and aesthetics (García, 2016). It uses various components that, together with game aesthetics, create the player experience.

At the individual level, gamifying an activity requires finding the right way to motivate the right person at the right time (Parra, 2024). Therefore, it is essential to understand the different motivations that lead the learner to become more involved in the learning process.

In addition, the social component plays a relevant role, i.e., the participation of other people with whom to compete, collaborate and compare achievements. In social games, the objectives can be competitive or collaborative (Contreras, 2018). Therefore, in team games it is necessary to consider separately the mechanics that affect the team (projects, group scores, etc.) and those that apply only to the individual (motivation, positive reinforcement, etc.).

Following these guidelines, an experience of educational innovation is developed to effectively apply the concept of gamification in the teaching process of the subject of Political Economy. This subject deals with the basic functioning of the economy, as well as its implications in the allocation of resources, production and income distribution, among other objectives.

The implementation of the gamification methodology in the classroom generally follows these steps: User and context analysis, Definition of learning objectives, Experience design, Resource identification and Application of gamification elements.

This approach leverages gamification to enhance understanding of economic concepts and encourage active student participation (Palomino, 2021). Each topic begins with key concepts presented through pre-designed slides that integrate theory, practice, and in-class questions. The session concludes with a review of key points and common errors (Illustration 1).

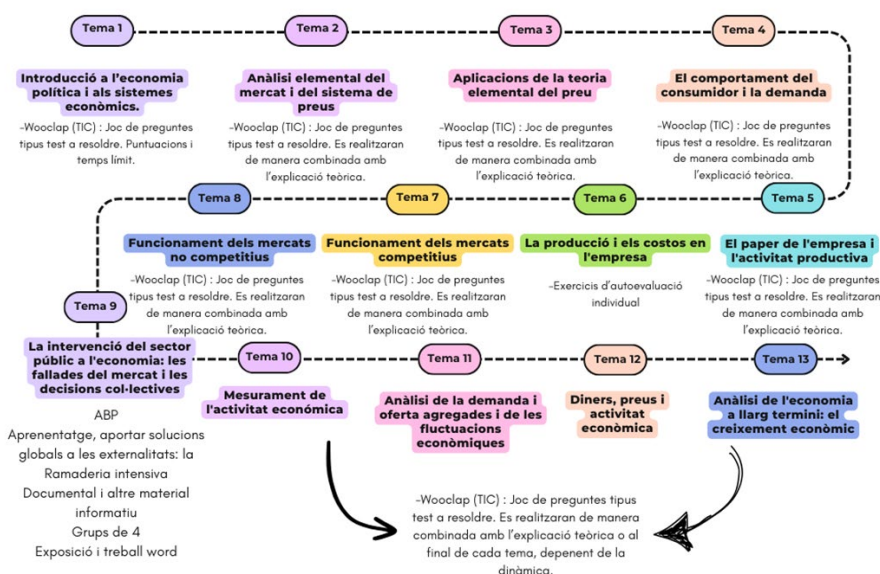
Including multiple-choice questions in theoretical or practical explanations enhances student attention. The game assigns individual scores based on accuracy and response time, with an option for team play to encourage collaboration and tackle complex questions. Questions can be integrated during or at the end of the session, depending on class dynamics. The game lasts no more than 20 minutes and helps assess students' understanding of key concepts.

Ultimately, the overall scores obtained provide insight into the level of assimilation of the explained concepts, enabling further exploration and/or review of any point deemed necessary.

## **2.2. Theoretical Framework for PBL (Project-Based Learning)**

In Problem-Based Learning (PBL), students take an active role by analyzing and understanding the problems, seeking the necessary information, collaborating with their peers, and critically evaluating the results. Throughout this process, instructors act as guides and facilitators, supporting students in their learning journey (Buzova & Sanz-Blas, 2023).

The effectiveness of PBL is highly dependent on the design of the problems, which should take into account three key factors: relevance, scope, and complexity. Problems should be meaningful and closely related to students' future professional fields, encouraging them to investigate and explore solutions independently. In addition, they should present a level of complexity that requires integrating knowledge from multiple disciplines, fostering a deeper understanding of the subject matter and enhancing problem-solving skills (Toledo Morales & Sánchez García, 2018).



*Figure 1: ICT Flowchart and Methodologies by Topics (Valencian language).*

PBL fosters high-quality knowledge by promoting critical thinking, skill development, and competency training. It enhances problem identification, self-directed learning, decision-making, and collaboration, preparing students for professional challenges (Vargas & Barrera, 2021). In this case, students will work in groups of up to four to explore market failures and government intervention (Topic 9), with a focus on sustainability. They will analyze the social, environmental, and economic impacts of cases like intensive livestock farming or photovoltaic plant construction and propose solutions to mitigate these effects by internalizing external costs.

Students must recognize that decisions affect the economy, environment, and society differently, making it difficult to satisfy all stakeholders. As political science and law students, they must evaluate the best solution, considering its broader consequences. The goal is to promote a just, sustainable society and economic growth. Proposals will be peer-reviewed based on environmental, social, and economic criteria, fostering debate and deeper learning.

### 3. Results

The Political Economy course is taken by first year students in the following undergraduate degrees:

- Degree in Law
- Double Degree in Law + Political Sciences and Administration

- Double Degree in Law + Criminology

This results in a total of approximately 850 students, which are split into 17 groups. However, because of the novelty of the project not all teaching staff have applied the methodology yet, and therefore preliminary results are only available for two of the 17 groups so far. Additionally, because not all students answer the questionnaire, the final sample is n=39. To collect the data, at the end of last semester, students were given a questionnaire where they had to evaluate different items regarding their satisfaction with the teaching methodologies, their perceived results, as their feedback for improvement. For those items concerned with the satisfaction of the teaching methodologies as well as their perceived results, the questions are scored with values ranging from 0% if the student reported the lowest level of satisfaction and 100% if the student reported the highest. Then, the average of these responses is calculated and reported as the ‘Satisfaction Level’ for that question. The results of the questionnaire are shown in Table 1.

First, we find that the interactive questions through Wooclap to be effective in improving the learning experience of students, as evidenced by the levels of satisfaction of over 90% in both questions related to Wooclap. Moreover, while the Project Based Learning also seems to improve the learning experience of students, it does so slightly less than the interactive questions.

In terms of learning results, the exercises as well as the test questions seem to help the students understand the course better, however, the value of the practical exercises by themselves is slightly diminished.

**Table 1. Satisfaction levels for teaching methodologies and their results.** Source: Own elaboration.

Question	Satisfaction Level
<b>Teaching Methodologies</b>	
Q1: The classes in Political Economy have implemented Wooclap as a platform for continuous interaction. How would you value this experience?	91.03%
Q2: Do you agree with the amount of time devoted to dynamic questions (Wooclap) during the sessions?	94.87%
Q3: Do you think the Project-Based Learning (PBL) has helped you deepen your knowledge of market failures?	82.05%
<b>Results</b>	
Q4: Do you think the exercises as well as the test questions after each topic have helped you understand the subject?	88.03%
Q5: Value the usefulness of the practical exercises	80.77%
Q6: The subject has helped me learn about economics	82.05%

Regarding the feedback items, several non-ordered options were given in each question with the intention of learning what could be done better to improve the learning experience in future

editions of the course. The results for these questions are presented in Table 2, where the students show a higher preference for Wooclap questions as well as PBL, which falls in line with the current teaching project. Moreover, the students also report that the methodology used during the course is quite different from that in other courses. However, this result cannot be evaluated as either positive or negative just yet, at least until we are able to produce data on learning outcomes.

**Table 2. Frequency of answers for feedback items.** Source: Own elaboration.

Question	Frequency (n=39)			
	Wooclap questions	PBL	Inverted Classroom	Time devoted to theory
Q1: If you were to take the course again, what teaching method would you like to see emphasised? (Multiple choice)	15	16	9	7
	Very different to that of other subjects	Somewhat different to that of other subjects	Very similar to that of other subjects	Almost the same to that of other subjects
The methodology employed in the economics course has been	22	16	1	0

#### 4. Conclusions

The learning tools based on gamification and project-based learning manage to increase students' interest in the subject of Political Economy. First, the use of Wooclap in the classroom managed to increase student attendance to the theoretical classes. The combination in the same presentation of the concepts to be addressed together with random questions that students solve in class increased students' attention significantly. Students value very positively the change in the usual dynamics, based on lectures and practical exercises. With respect to project-based learning, students show a high level of interest in combining theory related to market failures with current examples. Beyond their theoretical analysis, it allows them to provide possible solutions to mitigate the negative social, environmental and economic impacts generated. However, a greater number of surveys are required in order to analyze the results in depth and to be able to improve the dynamics used.

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