

VIRTUAL MOCK TRIALS: TEACHING SUSTAINABILITY CONCEPTS IN A DISTANCE-LEARNING BIOLOGY COURSE

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Innovative Experience: Case Study

Higher Education

Instructional Design

Concluded Study Report

ABSTRACT

The use of virtual mock trials is proposed as a ludic learning technique that provides students with an opportunity to develop their ability for argumentation and cooperation, besides their artistic capabilities. We report the experience of using virtual mock trials as a teaching and evaluation activity in the “Sustainable Cities” course, which is part of the complementary curricular activities offered by the Distance Education Biology Teacher Training Program offered by Ceará State University together with Open University of Brazil, with support from the State Secretariat to Support Educational Technologies. Twenty-three students were divided into five teams and assigned to debate the question of whether or not the capitalist model is responsible for the world’s existing environmental problems. Based on research of articles and books, the teams produced scripts on the theme, created fictional characters and held mock trials, simulating a real situation. The trials were recorded and posted on Youtube®. The assessment considered analysis of the arguments; organization of the scenario, fictional characters and language; quality of the video; and minimum exposition time. Four teams obtained scores of 100% and one 80%. The results reveal the activity contributed to stimulate critical thinking, argumentation, creativity, cooperation and ethics among the students, so the use of mock trials can be a good teaching resource in distance learning programs at the university level.

Keywords: virtual mock trial, distance learning, teaching resource.

1 – Introduction

The current technological transformations are prompting diversified perceptions and modes of reasoning, leading to the emergence of new methods in the processes of teaching and learning (Kenski, 2008).

According to Garcia and collaborators (2011), it is necessary to expand the technological repertoire of teachers to enable them to instrumentalize pedagogical practices based on new paradigms, as well as to pass through a more profound process, in which teachers become more critical and reflective.

Distance education inherently depends on the use of communication technologies to impart knowledge, and has been expanding remarkably, keeping pace with technological development. However, in some situations this only involves the transposition of traditional in-person classroom practices to virtual environments (Gossenheimer, Castro and Carneiro, 2014).

In this context, the use of mock trials, a technique originally developed for training lawyers, has attracted a good deal of interest as a teaching tool in other fields. By giving students conditions to defend their conceptions by means of argumentative discourse and expose their views on controversial themes, it brings them nearer to real conditions of scientific production and its relations with technology, society and the environment. It also allows them to work with artistic concepts of communication and expression and examine issues from all sides, since the students are divided into groups, variously playing the roles of lawyers for the prosecution and defense, witnesses, jury members and the judge (Gomes and Barboza, 2013). The final result is a deeper understanding of the underlying issues.

In the present work, we started from a contextualized situation and challenged the students to discuss the following question: Is the capitalist system the main culprit for the existing environmental problems?

2 – Objective

Because we consider the holding of mock trials a promising teaching tool, we describe its use as an auxiliary didactic strategy in a university distance education course, presenting the pedagogical and technological options that

can be used for the purpose of stimulating students to reflect on and debate the challenges of sustainable development and their responsibilities in its promotion.

3 – Theoretical Framework

The changing profile of contemporary university students is a matter for reflection among teachers, who feel challenged by the new situations in which teaching-learning occurs. Teachers need to develop a broader vision and seek strategies that go beyond mere one-way transmission of knowledge, by incorporating dynamic activities that allow interaction of students and teachers in the construction of knowledge (Gossenheimer, Castro and Carneiro, 2014).

In this context, creative activities can whet the intrinsic interest of the human being, which might remain latent with only the use of expositive classes to convey knowledge (Oliveira and Soares, 2005), besides breaking down barriers between professor and student resulting from the formal character of the conventional classroom setting.

Among the varied activities, we focus on the use of virtual mock trials, a technique that in its essence requires interaction, participation, creativity, lucidity and argumentation to build and learn complex concepts of importance to modern society, such as good citizenship and sustainability (Albuquerque, Farias and Araújo, 2013). The idea relies on the model developed in the teaching of law, with adaptations for insertion in the teaching of other areas of knowledge.

The scenario of mock trials examined here involves three roles: the prosecutor, witnesses and judge. The prosecutor puts forward the accusation and the defense attorney presents the counterarguments, with each side questioning the witnesses (for the prosecution and defense), while the judge ponders the merit of the positions argued and issues a verdict (Plantin, 2008).

Real and Menezes (2007) present the mock trial as a way to stimulate interactive reflection, critical thinking, respect for differences and adoption of positions from concrete arguments. Based on the theory of Piaget, they point out that:

... the exercise of argument and at the same time anticipation of the other side's position in relation to one's own argumentation requires decentering, i.e., the ability to reflect based on the positions of others. (Real and Menezes, 2007, p. 96).

To illustrate the pedagogical operationalization of this tool, several authors have urged the discussion of controversial themes such as socioenvironmental questions as a way to approximate students to the real conditions of scientific production.

4 – Methodological Procedures

This article is a descriptive observational case study with a mixed approach (Yin, 2010). An experiment was conducted in January and February 2015 with 23 students of the Distance Education Biology Teacher Training Program of Ceará State University/Open University of Brazil (UECE/UAB), with support from the State Secretariat to Support Educational Technologies. The participants were drawn from elective class on Sustainable Cities, which lasts 40 hours and consists of three modules: (i) urbanization and urban planning: development and environmental impacts; (ii) sustainability: permaculture in cities; and (iii) sustainable cities in Brazil and the world.

The mock trial activity was proposed in the first module and the students were given seven days to conclude their projects. Initially, the students were asked to read the article "O desafio do desenvolvimento sustentável nas cidades e os fatores críticos para sua consecução" ("The challenge of sustainable development in cities and the critical factors for its achievement"), written by Graeml and Bittar (2007), which discusses sustainable development as an alternative to attain socioenvironmental balance. The objective of this reading assignment was to elicit reflection on the following question: Is the capitalist system the main culprit for the existing environmental problems?

After reading the article, the students were directed to reflect on the problem situation: "the fictitious city of Poluilândia has the highest regional indexes of air and water pollution, as well as suffering from heat islands, thermal inversions that aggravate the prevalence and severity of respiratory diseases, acid rain, erosion, flooding, landslides, absence of green areas and

endangerment of native flora and fauna. Besides these local problems, the greenhouse gases emitted by the city's activities contribute to global warming."

The students were divided into teams of up to five members and instructed to formulate a script and dramatize a trial in which the symbolic defendant was the capitalist system, accused of killing the city's native flora and fauna. In each team the students rotated in the roles of public prosecutor, counsel for the defendant (capitalism), two witnesses (for the prosecution and defense) and judge, to render the verdict.

The simulated trials were filmed, with the edited videos lasting at least 10 minutes. They were then posted through a free collective account on YouTube®. The links to access the videos were made available on the Moodle platform for subsequent evaluation by the tutors of the distance education course.

The criteria for evaluation were: use of coherent accusation and defense arguments; conviction in presenting the discourses; organization of the scenario, fictional characters and language; quality of the video in terms of image and sound; and sufficient duration (at least 10 minutes).

5 – Presentation and Discussion of the Results

The five videos produced by the students can be accessed by the following links:-

<https://www.youtube.com/watch?v=QSCvNka6LVM> ,
<https://www.youtube.com/watch?v=omIJWFdDHig>,
<https://www.youtube.com/watch?v=3ykBJJO9C-k&feature=youtu.be>,
<https://www.youtube.com/watch?v=zkeK7eREWg0&feature=youtu.be> e
<https://www.youtube.com/watch?v=-9EyzgILxyc&feature=youtu.be>

The teams were identified by the letters A, B, C, D and E. Four teams received grades of 100% while one team received 80% (team E), since the video as shorter than the minimum time requested, which impaired the argumentation. With respect to contents, teams A and E created for judgment, respectively, the construction of a textile factory and a tourist resort undertaking which had allegedly aggravated the city's environmental problems.

As a peculiarity, team E put the mayor on trial, accused of having promoted the undertaking, instead of the capitalist system, as the other teams did. Team A presented as arguments for the prosecution the land clearance

caused by construction of the factory, the increase in air pollution (precursor to respiratory diseases) and the accumulation of solid wastes and pollutants in rivers. On the other hand, the defense arguments were that the factory had created jobs and income, stimulating the city's economy and increasing municipal tax revenue, thus benefiting the entire population.

The discourses transcribed below, used by the witnesses for the accusation and defense, respectively, were fundamental for discussion of the theme as well as for conclusion of the case.

"According to the investigation conducted in the area of Poluilândia, the textile factory brought many environmental problems, such as air pollution, accumulation of trash, and pollution of rivers. [...] Another aspect is deforestation of protected areas. [...] An additional factor of concern is that in previous years the city of Poluilândia attracted many tourists, while today it has lost credibility in this market." (witness for the accusation – team A)

"In my city, Poluilândia, people had virtually no financial benefits. Commerce was very sluggish and nobody had a chance to grow economically; commerce was behind the times. But with the arrival of the capitalism, everything changed. Now the city has greatly improved from an economic standpoint. Everyone now has a job, because a textile mill arrived and gave an opportunity to everyone." (witness for the defense – team B)

In the discussions presented by the teams, the arguments for the prosecution were more convincing, since the defenses were mainly based only on the financial advantages provided by capitalism.

Both team A and team E brought interesting arguments, such as the existence of laws, as well as evidence (affidavits of respiratory disease), to support the positions argued, making the simulation nearer to a real trial.

Only team D did not declare capitalism guilty, because the students opted not to convict or absolve the defendant, based on the finding that the system on trial brought both benefits and problems to society.

The other teams found capitalism guilty as charged. Among the penalties applied were a fine for reclamation of degraded areas (team A); reparation of all the damages caused (team B); compensation to families harmed by the damages caused (team C); and suspension of the activities of the municipal government for failing to obey the legal prescriptions (team E).

Table 1 reports the evaluation of all the teams, considering the conviction in presenting the discourses; organization of the scenario,

appropriateness of fictional characters and language used; quality of the video in terms of image and sound; and sufficient duration.

Parameters Evaluated	Teams				
	A	B	C	D	E
Conviction in presenting the discourses	+	+	+	+	+
Organization of scenario, fictional characters and language	+	+	+	-	-
Sound quality of the video	+	+	-	-	+
Image quality of the video	+	+	+	+	+
Minimum exposition time	+	+	+	+	-

Table 1. Parameters evaluated of the mock trial videos created by students in the class on "Sustainable Cities" offered by the Distance Education Teacher Training Program of UECE/UAB, Fortaleza, Ceará. Legend: (+): executed with coherence and quality; (-): not executed with coherence and quality.

Besides the assigned reading, the students sought information in the popular press (newspapers and magazines) focused on environmental, social and economic issues, to help form their opinions and support debate on the two points of view (Souza, Marqui and Silva, 2013).

On the whole, the effort to produce the mock trial videos provided an opportunity for the students to study the conundrum of economic development versus environmental quality, using creativity along with knowledge to formulate their arguments and present evidence. In this way, the use of the technique was a success, by stimulating reflection, critical thinking, creativity and development of argumentative contents and skills.

Furthermore, the use of YouTube® as a tool for disclosure enhanced the advantages of the activity, since the students, besides producing the videos through a team effort, could share their efforts with the other teams, giving their colleagues a chance to suggest improvements and/or demonstrate their opinions, leading to the construction of new arguments.

As a proposal for optimization of this tool in the future, we suggest an exercise conducted in real time through a site that permits live and simultaneous interaction between students and tutors.

Based on this discussion, we reiterate what Real and Menezes (2007) advocate: it is necessary to train students to be flexible and open to a constant process of learning, able to deal with various situations and resolve unforeseen problems. Therefore, students should not be mere spectators of knowledge. It is important for them to take a critical and reflective stance in the teaching-learning process. In this context, it is essential to develop activities like this one that stimulate debates and discussions inside and outside the classroom.

6 – Conclusions and Recommendations

The use of mock trials proved to be an interesting and instigating strategy by promoting critical reasoning, creativity and lucidity. It was useful to stimulate the argumentative skills of the students and develop communication and expression, besides stimulating the appropriation of technological tools such as production of videos and use of websites, like Youtube®, for sharing experiences.

The activity was productive, because the students collectively built coherent discourses, with arguments based on situations near reality, to debate the important theme of environmental sustainability, which is often not properly stressed in school programs.

The results showed that the students adequately reflected on the positive and negative aspects of capitalism, observing the need to maintain a balance between society and nature. The students became real actors in this process, which will help them make reasoned and informed decisions in their professional and daily lives.

Therefore, we consider the use of mock trials to be a good option that mixes theory and practice, stimulates argumentation, critical thinking, creativity, cooperation and the use of technology, making future teachers better prepared to face similar situations in their work, besides learning to deal with ethical questions with respect for others.

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