



RULES FOR THE OPTIONAL SUMMARY

(WRITTEN ALWAYS IN ENGLISH)

Analysis of the role-playing game's impact in the development of the argumentation from the students of science in A levels

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Abstract: - The present work belongs to a line of investigation about the design, development and assessment of the role-playing game as an innovative methodological strategy for the teaching of sciences and the environmental education in obligatory and post-obligatory secondary education. The first advances in this line, referred to the design and launch of the role-playing game, were presented in the International University Conference about the communication working and at the university nowadays: CUICIID 2014. Likewise, the preliminary results in relation to the students' attitudinal change promoted by the role-playing activity, were presented in the edition CUICIID 2015.

Continuing with the same line of investigation, this third phase is dedicated to the assessment of the role-playing game as a methodological strategy to promote the development of the scientific competence through the argumentation. Thus, it is focused on the impact of the activity in students' argumentation process, analysing their written productions before and after their participation in the role-playing game (Pre-Post Test). These written productions include the students' opinions about the construction of a wind marine park in a coast next to their city (a proposal which was debated in the role-playing activity). Firstly, a methodology based on the Toulmin Model was employed to determine the complexity of the students' arguments. Then, the arguments given by the students before and after the activity were compared, in order to appreciate a possible development due to the influence of the role-playing game.

The preliminary results show a positive impact of the role-playing game in the students' argumentation process, since the opinions given after the activity present, mostly, more complexity (measured according to the number of justifications, arguments which support these justifications and the appearance of modifiers).

Finally, proposals are formulated to improve the application of the role-playing game as an effective tool in the students' argumentation process.

Key-Words: - teaching of sciences – methodological innovation – scientific competence – role-playing game – argumentation

1 Introduction and objectives

The relevance of the argumentative reasoning for the teaching of sciences has been stated by several authors [4], [5], since one of the objectives of the scientific investigation is the generation and justification of statements and actions for the comprehension of the nature [2]. For this reason, the teaching of sciences should give the opportunity to develop, among others, the capacity of reasoning and arguing, so it is necessary to develop strategies which promote the process of argumentation and the development of the critical thought, understood as the capacity of reflection about socioscientific issues and the intervention in Society [2].

One of these strategies could be the role-playing game, whose educational advantages have been studied deeply by authors like [6] and [1], among others. In addition, the contributions from [4] and [5] can be found, in relation to the argumentation, which is a very important process in the development of role-playing activities.

In the present investigation, the role-playing game is stated as a strategy to the environmental education in the formal education able to answer the methodological necessities which appears when

working with socioenvironmental problems in class nowadays. Thus, it is considered that the role-playing game could contribute to the development of the scientific competence in issues related to the searching and selection of information, the development of critical thoughts and, what is the main objective: contributing to the development of the students' argumentation process.

2 Methodology

The role playing-game was put into practice with two groups in class: social science A level (31 participant) and science and technology A level (23 participant). Three sessions were used in each group. In the first session, a discussion was carried out, in order to know the students' previous ideas about the proposal (the construction of a wind marine park in a coast next to their city). The students' initial opinions about the proposal were gathered (Pre-Test) and the presentation of the activity was made (distribution of roles and tasks, and preparation of groups). The second session was focused on the dramatization of the role-playing game in class and the picking up of the students' opinions after the process of investigation and exposition made for the activity (Post-Test). In the third session, the assessment of the activity and the students' reflection were made.

The Toulmin Model was used to analyse the students' opinions, picked up both by the Pre-Test and the Post-Test. The objective of this analysis was determining a possible development in the arguments used by the students before and after the role-playing game, in order to assess their influence in the students' argumentation process.

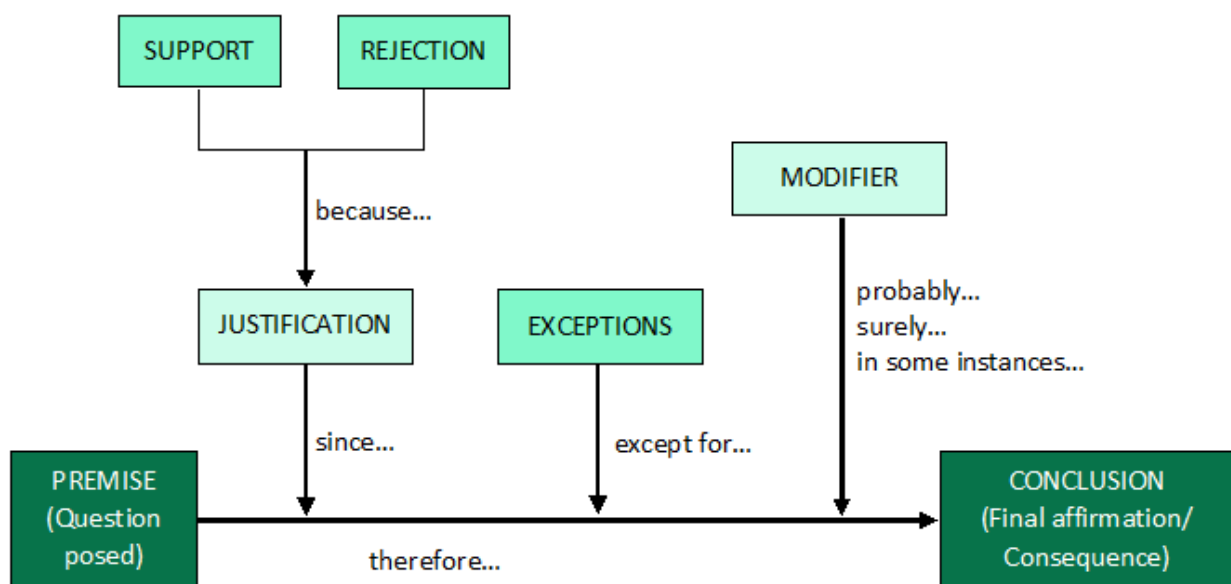


Fig.1: Toulmin Model modified from [3].

3 Preliminary results

During the analysis of the students' opinions before and after the role-playing activity, it was observed the existence of a development in the arguments used by the participants in the following aspects:

Before the role-playing game, the opinions given by the students supported or rejected the proposal focusing on their previous ideas. These previous ideas were employed in the text to justify their decision (I agree/disagree, because...), but they didn't present any kind of justification (since...), exception (except for...) or modifier (probably... surely... in some instances...). Therefore, the opinions which constitute the Pre-Test are not complex, since they are in the first level of the diagram based on the Toulmin Model (see Fig.1).

The opinions given by the students after the role-playing game, supported or rejected the proposal according to the information obtained during the preparation of the activity and in relation to the data presented by the different roles during the dramatization. Thus, the arguments from the Post-Test were more complex (justifications, exceptions and modifiers) than those from the Pre-Test (see Fig.2).

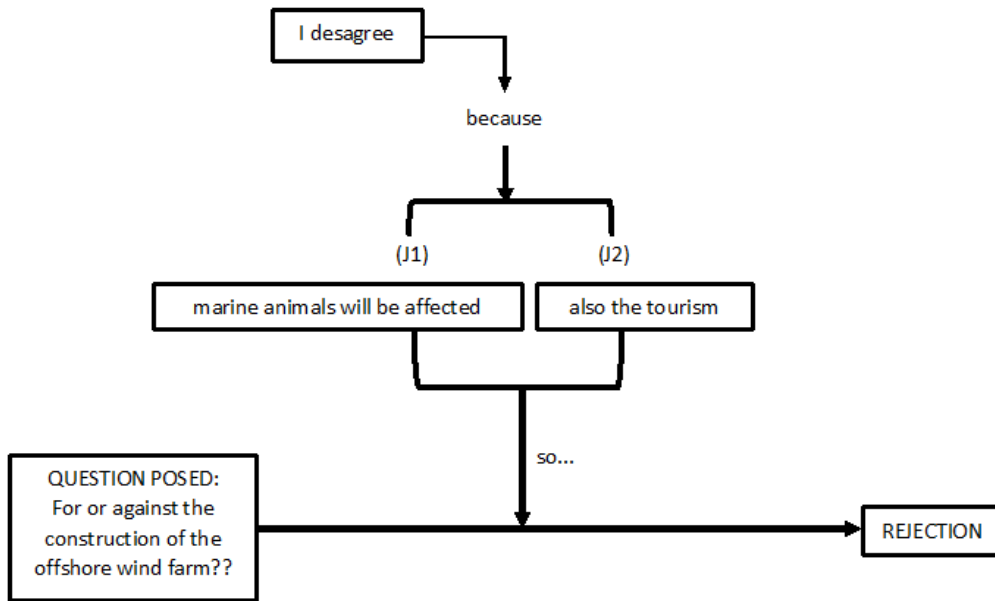


Fig.2: Example of the opinion written by a student in the Pre-Test.

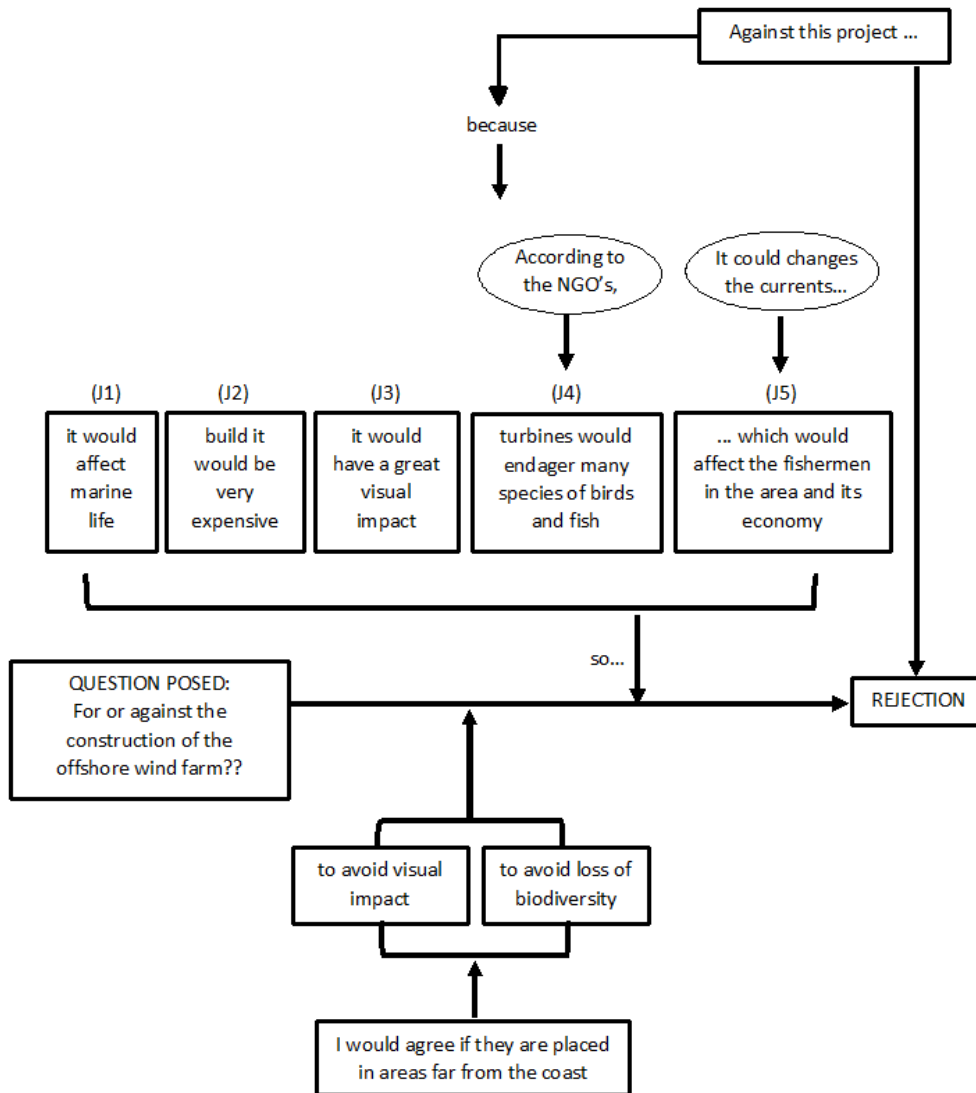


Fig 2.: Example of the opinion written by a student in the Post-Test.

4 Conclusion

After analysing the arguments used by the students before and after the role-playing activity, the preliminary results seem to show a positive impact of this activity in the development of the students' argumentation process in A level. Therefore, it is considered that the role-playing game can be an appropriate strategy for the development of the scientific competence in relation to the argumentative process and the development of the critical thought. These aspects are benefited by the abilities which the students have to put into practice to develop the role-playing activity: searching and selection of information to prepare the roles, formulating statements to justify a reasoning and discussing the information presented by the different participants.

Finally, it is interesting for the investigation to continue with this analysis of the argument in other groups, especially in those from the obligatory secondary education, in order to determine if this positive impact also appears in the students at this stage.

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