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Video Annotations for the Development of Environmental Citizenship during Initial Teacher Education †

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Abstract: The social and environmental issues facing society call for changes in educational approaches. The massive use of video as a resource for dissemination on social networks calls for further analysis and reflection in education. A video analysis activity using annotations with the CoAnnotation.com platform to develop environmental citizenship is presented. In total, 104 preservice elementary teachers participated in work at Malaga University (Spain). The examined socio-scientific issue was related to illegal mining in Venezuela. Students were able to identify environmental, health, and cultural issues, in this order. The video annotation helped discuss and map a socio-scientific problem to facilitate the analysis of its complexity.

Keywords: video annotation; socio-scientific issue; preservice primary teachers

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1. Introduction

The complexity of the important social and environmental issues of the current global crisis poses new educational challenges that require special attention. Among them, we highlight the challenge of facilitating citizens' empowerment for democratic involvement in social issues related to science and technology through socio-political activism [1]. Students' socio-political action, according to Bencze and Carter [2], has the potential to improve: (a) their knowledge and awareness of these topics; (b) their research and citizenship skills; and, finally, (c) the well-being of individuals, societies, and environments. However, in order to develop these competencies in students, activism must first be introduced into teacher training. Indeed, preservice teachers will only be able to engage their students in activism projects to change society and the environment if they engage in socio-political actions themselves [3]. One of the methods that can carry out these types of social transformations is video podcasting or vodcasting [4], mainly if the videos are produced and distributed by students as a form of socio-political action [5].

With this aim, in the context of science education, we want to contribute to the training of environmental citizens, agents of change capable of solving contemporary environmental issues through individual and collective actions [6]. To this end, this paper proposes video annotations as a teaching activity for the analysis and discussion of activist videos with socio-scientific content.

2. Methodology

2.1. Participants

This teaching activity represented a preliminary step in the development of an educational activism programme with 104 preservice elementary teachers (PSETs) (aged between 20 and 21 years) at Malaga University (Spain).

2.2. Video Annotation Activity

The activity consisted of viewing an activist video about illegal mining in the Venezuelan Amazon and analysing it through collaborative online annotation of fragments of the video [7]. With this purpose, the open-access platform CoAnnotation.com was used to select fragments of the video in which the students were told to do the following.

(1) Choose one of the problems created by illegal mining mentioned in the video. Choose the one you believe is the most serious and justify your decision in the annotation. (Each student should have one annotation.)

(2) Choose the best solution from among the recommended solutions to the problem you have seen. If the video does not offer a solution to the problem you have selected, you can annotate a section of the video and submit your own. (Each student should have one annotation.)

(3) Identify sections of the video that, in your opinion, might be enhanced to increase public awareness regarding illegal mining in Venezuela. (Each student may add one or more annotations.)

Figure 1 shows a screenshot of the CoAnnotation platform with the task to be carried out, demonstrating the video and the visible statistics of where the annotations on the video are concentrated.

Figure 1. CoAnnotation platform with the statistics of the annotations.

Subsequently, a discussion session was held based on the analysis of the set of annotations on the different fragments of the video.

2.3. Data Collection and Analysis

For the content analysis of the video annotations and the class discussions' observation records, an expert-validated categorisation system was used. The data were read several times until agreement was reached between the authors, generating three main categories that coincide in both the problems and the solutions: environmental, health, and socio-cultural. An annotation could be categorised in more than one category.

A Sankey diagram was used to visualise the relationships between the problems and the solutions identified by the PSETs. The Sankey diagram shows the number of students who identify a particular problem on the left and the number of students who identify a solution on the right. With coloured lines, environmental solutions could be identified in green, socio-cultural solutions in blue, and health solutions in red. The thickness of the line size depended on the number of students who identified a specific problem and connected it to a particular solution.

3. Results

The 104 students contributed with 369 annotations to the video as a whole. Only the results of the annotations associated with the problem and specific solution are shown.

Figure 2 represents the number of students who identify each of the three types of problem (environmental, health, and socio-cultural), together with the kind of solution they propose.

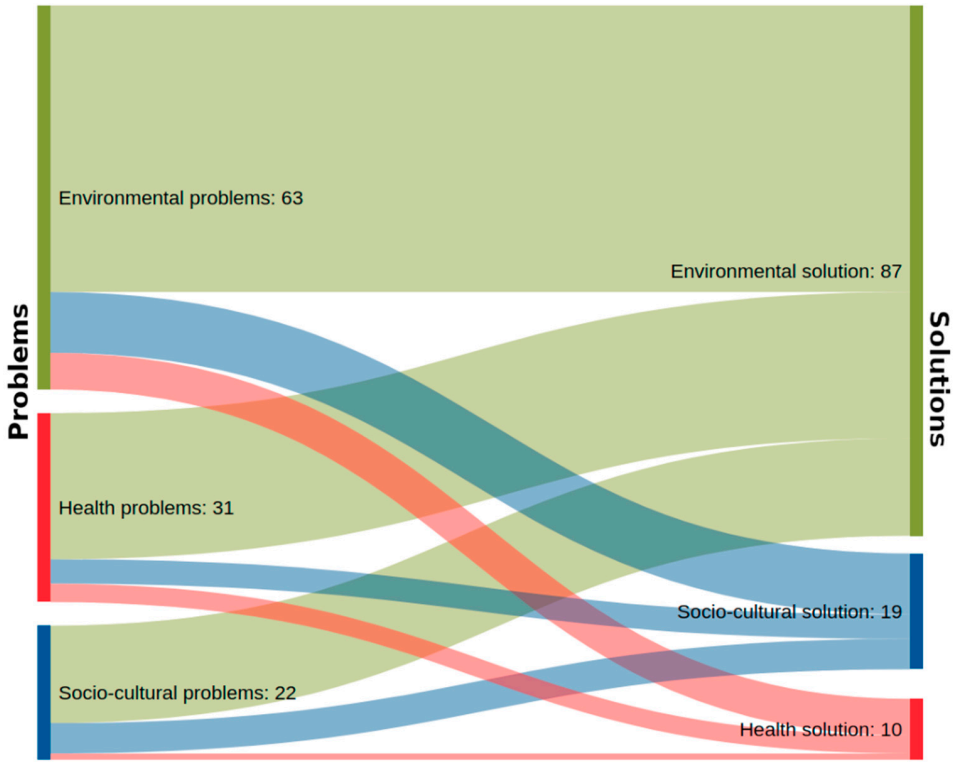

Figure 2. Sankey results of problem and solution annotations.

A large majority of students identified environmental problems (63 students), compared to health problems (31 students) and socio-cultural problems (22 students).

As one might expect, a solution for a problem of the same type is commonly advocated, such as an environmental solution for an environmental issue. Surprisingly, Figure 2 further shows that all three types of solutions were primarily proposed to address an environmental issue (the thickest line from each kind of problems links to the environmental solution). One student, for example, addressed the problem as follows: "This mining not only has an impact on the natural world but also on a cultural level, creating serious health problems, as well as a rise in prostitution, drug use, alcoholism, flight of capital and smuggling. This has a major social impact". Although this student mentioned health and societal problems, his solution was primarily focused on the environment: "The solution lies in building a people's task force to develop environmental education and communication initiatives so as to ensure that nature is fully respected and promote sustainable development".

4. Discussion and Conclusions

While some students mentioned all three types of impact (environmental, health, and social-cultural) in their annotations, their preferred solution was only focused on the environmental level. This leads us to believe that this activity could contribute to the development of environmental citizenship based on pro-environmentally responsible behaviours, in which citizens act and participate in society as change agents in the private and public spheres, at local, national, and global scales, through individual and collective actions aimed at solving current environmental problems, preventing the emergence of new environmental problems, and achieving environmental goals [4].

Video annotations enable the discussion mapping around socio-scientific problems, including an identification of those problems, participating citizen groups, possible causes-effects, and prospective solutions. This can be used in conjunction with other approaches, such as controversy mapping [8], which use actor–network theory to analyse the interconnections between actants [9]. The video and annotations are both helpful to teacher education since they complement Hodson [1]'s notion of learning about action, learning from action, and learning through action. Students in this study watched an activist video to learn about action and identify the skills and methods needed to make an activist video. As another task, they analysed the video's information to see if it was possible to strengthen the activist component. At this time, students were developing their skills in producing activist videos with a more significant impact on viewers. These skills can empower students as video creators and prospective activists, training them for action (for example, through social media distribution of videos) [10]. Preservice teachers can use video annotations to analyse the outcomes of activist projects they or others have undertaken, allowing them to learn from the action.

In conclusion, we consider that the use of video annotations can aid the development of environmental citizenship during the initial training of teachers, allowing them to learn a teaching resource adequate for the identification and critical analysis of important and complex socio-scientific problems: a preliminary step to socio-political action [1].

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