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ANALYSING UNIVERSITY STUDENT'S OPINIONS ABOUT ENVIRONMENTAL EDUCATION PROJECTS: A CASE STUDY THROUGH DOCUMENTARY METHOD

ANÁLISIS DE OPINIONES DE ESTUDIANTES UNIVERSITARIOS SOBRE PROYECTOS DE EDUCACIÓN AMBIENTAL: UN ESTUDIO DE CASO A TRAVÉS DEL MÉTODO DOCUMENTAL

ANÁLISE DE OPINIÕES DE ESTUDANTES UNIVERSITÁRIOS SOBRE PROJETOS DE EDUCAÇÃO AMBIENTAL: ESTUDO DE CASO PELO MÉTODO DOCUMENTAL

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Abstract
Assessing an Environmental Education Project (EEP) is a critical and unavoidable stage in improving the processes implied for its development. In order to identify positive and negative aspects of a particular EEP, getting feedback from not involved external evaluators can contribute to enrich the vision. This research presents a qualitative approach based on a case study through the documentary method. The participants were 22 university students of the Degree of Environmental Sciences from Spain. They watched two short videos about the goals and activities of an EEP carried out in rural areas of Argentina and then wrote letters 500 words máximum lenght to the responsibles. The content analysis was performed by coding with three coders (Fleiss kappa = 0.62). The selected coded units were 175 and they were structured into 10 categories, grouped into 3 dimensions: educational models (53.6%), impact on the local community (29.8%) and scientific content on sustainable development (16.6%). Aspects were valued positively in their majority, especially with reference to an innovative, active, and practical pedagogical model and the importance of the social and cooperative perspective of the institutions. The most relevant negative aspect that was detected is the need for an integrated perspective when addressing the scientific content.

Keywords: Environmental education; Educational models; Education for sustainable development; Community participation; Documentary analysis.

Resumen
La evaluación de proyectos de educación ambiental (PEA) es una etapa crítica en la mejora de los procesos que implican su desarrollo. Obtener retroalimentación de evaluadores externos no involucrados en el PEA con el objetivo de identificar aspectos positivos y

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negativos de un proyecto particular, puede contribuir a enriquecer su visión. Esta investigación presenta un enfoque cuantitativo basado en un estudio de casos empleando el método documental. Los participantes fueron un total de 22 estudiantes universitarios de la Licenciatura en Ciencias Ambientales de España, quienes vieron dos videos cortos sobre los objetivos y actividades de un PEA realizado en zonas rurales de Argentina y luego redactaron cartas de 500 palabras como máximo a los responsables. El análisis de contenido de las cartas se realizó codificando con tres codificadores (Fleiss kappa=0.62). Las unidades codificadas seleccionadas fueron 175 y se estructuraron en 10 categorías, que se agrupan en 3 dimensiones: modelos pedagógicos (53.6%), impacto en la comunidad local (29.8%) y contenido científico sobre desarrollo sostenible (16.6%). Estos tres aspectos fueron valorados positivamente de forma mayoritaria, especialmente con referencia a un modelo pedagógico innovador, activo y práctico, a la importancia de la perspectiva social y cooperativa de las instituciones. El aspecto negativo más relevante que se detectó es la necesidad de una perspectiva integradora a la hora de abordar el contenido científico.

Palabras clave: Educación Ambiental; Modelos Educacionales; Educación para el Desarrollo Sostenible; Participación Comunitaria; Análisis Documental.

Resumo
A avaliação de um Projeto de Educação Ambiental (PEE) é uma etapa crítica e incontornável na melhoria dos processos implicados no seu desenvolvimento. Para identificar aspectos positivos e negativos de um determinado EEP, obter feedback de avaliadores externos não envolvidos pode contribuir para enriquecer a visão. Esta pesquisa apresenta uma abordagem qualitativa com base em um estudo de caso por meio do método documental. Os participantes foram 22 estudantes universitários da Licenciatura em Ciências Ambientais da Espanha. Eles assistiram a dois vídeos curtos sobre os objetivos e atividades de um EEP realizado em áreas rurais da Argentina e depois escreveram cartas de no máximo 500 palavras para os responsáveis. A análise de conteúdo foi realizada pela codificação com três codificadores (Fleiss kappa = 0,62). As unidades codificadas selecionadas foram 175 e foram estruturadas em 10 categorias, agrupadas em 3 dimensões: modelos educativos (53,6%), impacto na comunidade local (29,8%) e conteúdo científico sobre desenvolvimento sustentável (16,6%). Aspectos foram valorizados positivamente em sua maioria, principalmente no que se refere a um modelo pedagógico inovador, ativo e prático e à importância da perspectiva social e cooperativa das instituições. O aspecto negativo mais relevante detectado é a necessidade de uma perspectiva integrada ao abordar o conteúdo científico.

Palavras-chave: Educação ambiental; Modelos Educacionais; Educação para o Desenvolvimento Sustentável; Participação da comunidade; Análise Documental.

Introduction

Higher education institutions are needed to play a leading role in considering and searching for solutions to problems associated with sustainable development (FINDLER et al., 2019). This requires an innovative attitude in education and systematic dialogue and cooperation among various actors, different areas of knowledge, and multiple disciplines and sectors (ANNAN-DIAB & MOLINARI, 2017),

as set by the Principles for Responsible Management Education (PRME, 2015). Environmental problems and the link between scientific knowledge and the social transformation processes have become part of the political scenario and should be considered by the academia (BOYES & STANISSTREET, 2012; PAUW et al., 2015), particularly in connection with professional employment capabilities (THOMAS et al., 2013).

Assessing environmental education projects (EEP) is a critical stage in improving the processes implied for their development, and many strategies for it can be found in the literature, among others: Bogner (1999), Burmeister & Eilks (2012), Liefländer et al. (2015), Monroe et al. (2017), Rickinson et al. (2015) and Stern et al. (2014). Also, learning how to teach, especially about evaluative judgement (TAI et al., 2017), is conceived by teachers as a series of cognitive experiences of deep social and political subjective implications marking by their culture and their institutional path (AVALOS, 2011).

- Educational Models

Education for Sustainability has its origins in the 1970s, with a didactic development independent of the didactics of experimental sciences by also involving social, cultural, and humanistic perspectives (ANNAN-DIAB & MOLINARI, 2017). This situation makes teaching complex due to the existence of different educational paradigms involved, and particularly if the students are not considered as active participants in the process (DIELEMAN & JUÁREZ-NÁJERA, 2008). Understanding that education is a social and cultural phenomenon, pedagogical models are themselves models for teaching. These models recognise in Pedagogy not only a disciplinary knowledge, but also an object of conceptual criticism and review of the bases on which this theoretical scaffolding was built (CORNELIUS-WHITE, 2007). Also, educational praxis applies to different types of rationality: theoretical, practical, and ethical (KOPNINA, 2014; KUNTER et al., 2013; MAYER, 2004; PAYNE, 2010). The teaching practices and the way in which resources are used are relevant topics when

talking about a pedagogical model; from a student's simple copybook, the textbooks, the blackboard, classroom design and layout to the school laboratory resources or the digital ones. These resources tell much more about pedagogical models than one might apparently think. They are, in fact, the evident imprint of the epistemic conception of the pedagogy nourishing them.

For this work, conceptualization of hot and cold models (CAMILLONI et al., 2007) is followed. According to this author, in cold models, the analysis of information is limited because cold models only focus on solving problems through slogans, coding them, and processing this information. Hot models not only consider cognitive factors, but also other ones such as motivational factors, schemata activation, the general interest, and perception of the value of that knowledge to be applied in other contexts. Pintrich et al. (1993) and Sinatra's compilations (2005) are the basis of this classification of pedagogical models. In this sense, Camilloni et al. (2007) states that General Didactics aims to develop a fully comprehensive model not meant to include the entire instructional process. At this point, more detailed Specific Didactics models come into play due to content specificity.

Probably, a central challenge is to enable the deconstruction of internalised models. This deconstruction is not possible without a necessary objectification, and a critical reflexivity position (BARTHOLOMEW et al., 2018; HAMRE et al., 2013). In line with Bauman (2005), it is noteworthy that, in the liquid modern context, continuous education and lifelong learning are becoming a must have.

- Impact of EEP on the Community

Although there is still a debate among education researchers on the role of education in raising environmental awareness, everyone agrees that schools play a key role in involving society in the search for solutions to environmental problems (AARNIO-LINNANVUORI, 2019; PAUW et al., 2015; RICKINSON et al., 2015; SCOTT & OULTON, 1998).

Thus, EEP encourages students to understand they are community members with a sense of belonging and places them in the socio-environmental context where they live, making them feel responsible for the environmental problems there. This approach allows students to get involved and participate because what they learn is related to their interests (SCHUSLER & KRASNY, 2010; MONROE et al., 2019) and a relevant role of technology (SCHERER et al., 2018) and, more recently, social media (GREENHOW & LEWIN, 2015). The EEP's community-based approach analyses problems which range from the local to global issues. This does not mean downplaying world events. It implies understanding of what is happening in the country, province or community where schools and universities are located to identify problems, their impact, and possible solutions to raise environmental awareness (FINDLER et al., 2019; STEVENSON et al., 2016).

According to Aguilar (2018), community EEP should know the culture, institutions and local needs to be effective. Research has analysed the effects of EEP on school communities. An example of this is reflected in Volk & Cheak (2003) work. They used different assessment tools to analyse an EEP and their results reported not only improvements in the students critical thinking about environmental issues but also their teachers, parents, and the entire community at different levels.

- Scientific content and international framework on Sustainable Development

Curriculum wise, in 2003 the United Nations Educational, Scientific and Cultural Organisation (UNESCO) declared the Decade of Education for Sustainable Development 2005-2014 to integrate the principles and practices of sustainable development in education. In that document (UNESCO, 2003) some topics were defined as main themes, including climate change, sustainable lifestyles, and natural disaster reduction. In 2014, during the UNESCO World Conference on Education for Sustainable Development in Aichi-Nagoya (UNESCO, 2014), the World Programme of Action for Education for Sustainable Development was issued as a follow-up to the

previous programme. It was also used to redirect education for all people to acquire knowledge, skills, and attitudes to contribute to sustainability and strengthen education to promote sustainable development.

In 2015, the United Nations (UN) General Assembly adopted the 2030 Agenda for Sustainable Development (UN, 2015). At the heart of the 2030 Agenda there are seventeen Sustainable Development Goals (SDGs) which describe the main development challenges for humanity. This 2030 Agenda is to ensure a sustainable, peaceful, prosperous, and just life on Earth for all, now and in the future. These goals aim to integrate sustainable development principles and practices into all aspects of education, promoting changes in knowledge, values, and attitudes to enable a just society for all. This process includes institutional policies to generate the necessary spaces for the democratic participation of the many internal levels to define institutional strategies, to promote norms of coexistence, and to commit teachers to include sustainable criteria in the teacher training processes (LAMBRECHTS et al., 2013; SCHELLY et al., 2012).

Environmental education (EE) is then recognized as a fundamental and interdisciplinary pillar of education systems (GOUGH, 2013; SACHS et al., 2019). However, its presence in the school curriculum, both in Spain and Argentina is diffuse, because -unlike other areas such as literature or mathematics- it is not a compulsory curricular area in basic and secondary education. In general, EE is taught by the area of natural sciences without involving social, humanistic, and cultural perspectives (KOPNINA, 2020), although Science-Technology-Society (STS) approach are aspects somehow involved (LAMBRECHTS et al., 2013; LIU et al., 2019).

- Aims of the study and research questions

As a general objective, this research aims at providing elements for the assessment of an EEP developed in Argentina, from the external perspective of Spanish university students of the Degree in Environmental Sciences. To achieve this, three specific objectives were set:

(1) Identification of the best and least valued components related to the educational models applied.

(2) Identification of the EEP impact on both the local community and on the students directly involved.

(3) Identification of the connections observed in the project between scientific knowledge and international frameworks on sustainable development.

The study was based on a single research question: What positive and negative aspects are described by the Spanish students of the Degree in Environmental Sciences as regards the development of activities within the framework of EEP carried out in Argentine rural communities?

Metodology

- Research origin and context

This research results from the interaction between the University of Granada (Granada, Spain) and the National University of Litoral (Santa Fe, Argentina), through the cooperation among researchers from the Department of Didactics of Experimental Sciences and the PhD Programme in Experimental Sciences Education, respectively. In 2019, a Research Project called "La mensajería instantánea multimedia mediante Internet al servicio de la enseñanza en áreas disciplinares de Escuelas Secundarias públicas del norte de la provincia de Santa Fe (Argentina)" (IO-00118-17, funded by Agencia Santafesina de Ciencia, Tecnología e Innovación) was carried out by the National University of Litoral. The project aimed at promoting the acquisition of skills and knowledge needed to be inserted into digital culture literacy and into the society of the future from the EE standpoint.

As a result of this project, secondary school teachers' togeter with university researchers designed two pedagogical proposals to be developed at two Stage 5 rural schools in the Province of Santa Fe, Argentina. The first proposal (CORAGLIA,

QUARANTA & ODETTI, 2020) was for a group of 18 students (Secondary School no. 3023 "San José de Calasanz", Ramona village). This proposal trained students to design and implement their own EE initiatives and target them to the community. The identified environmental problems aimed to be reverted by actions such as: urban waste treatment, recycling, or ecological camps, among others. The second proposal was developed in a group of 20 students (Secondary School no. 538 "Armando Cavaille", María Luisa village). Linking the subject of Chemistry with local environmental problems they could study two main topics: anthropic pollution, using agrochemicals in extensive agriculture, and natural pollution of geological origin, that is, hydroarsenicism, i.e., arsenic in drinking water from underground aquifers. The actions developed contributed not only to the students' scientific culture in terms of learning specific curricular contents, but also, in a wider sense, to the students' families and social groups in general.

- Research design and participants

A qualitative design through the method of documentary analysis was applied for this case-study research, in line with Barth & Thomas (2012) and Tracy (2010). The participants were 22 university students who were attending the Degree in Environmental Sciences of the University of Granada (Spain). During 2019-20 these students took an optional subject called "Environmental Training and Education". The group was composed of 76% of women; 90% of the group had an age range of 22-25 years.

- Instrument design and data collection procedure

Two videos were produced by part of the project's teaching and research team from the National University of Litoral (Argentina). Each one lasted 15 minutes and described the project's objectives and development. These videos (ODETTI & PORCEL DE PERALTA, 2020a, 2020b), which offered a direct testimony to the event

in question, are interpreted as primary documents. The participating students watched both videos in a virtual lesson at the end of March 2020 due to COVID19 confinement. Both instructional videos were presented by the research professor at the University of Granada (Spain), the responsable person in charge of doing it in the context of the aforementioned subject.

After watching these videos, the participants were given an assignment: they had to identify, from their perspective, the positive and negative aspects in the development of the project in a letter of at least 500 words long. These 22 letters (RAMS, PORCEL DE PERALTA, ODETTI, 2020), analysed in this work, were received by e-mail in April 2020 and they are considered as secondary documents.

- Data analysis procedure

To answer the research question, a three-phase sequence was followed. In the first phase, each of the three researchers carried out a free style coding cycle of all the epistolary texts. The editing tool was ©Microsoft Word 2016. Out of 16,515 words, 55.2% was coded in 249 units. Next, a document with the summative coding of all the units marked by at least two of the researchers was prepared. There was a 70.3% of coincidence from a total of 175 units.

The aim of the second phase was to agree on the dimensions (D) previously identified, which resulted in three (D1, D2, D3). After that, each of the researchers, again on their own, performed an assignment of these dimensions over all the units selected. The degree of consistency of this assignment was performed with ©Microsoft Excel 2016 through the Fleiss kappa stats model. Thus, the following values were obtained: 0.63 for D1, 0.56 for D2, and 0.68 for D3. According to Regier et al. (2013) the values are interpreted as follows: 0.00-0.20 unacceptable; 0.21-0.40 questionable; 0.41-0.60 good; 0.61-0.80 very good; and 0.81-1.00 excellent. The mean obtained from the three dimensions is 0.62, which is interpreted as very good.

In the third phase, the coded units assigned to each dimension were grouped and subdivided according to the information from the original coding. This was done using ©Microsoft Access 2016 software to structure the information to each of their

dimensions. In this way, the emergence of ten categories (C1-C10) was observed, the definition of which was agreed among the three researchers. The percentage of coded units represented by each category is as follows: 20.5% C1; 12.5% C2; 8.6% C3; 12.0% C4; 12.0% C5; 6.8% C6; 5.8% C7; 5.2% C8; 5.8% C9, and 10.8% C10.

Results

Once the results had been obtained, they were separated to answer the research question according to the main categories assigned to the three identified dimensions: educational models (D1), impact on the community (D2), and scientific content on environmental education (D3). In addition, comments on suggestions for improvement in dimensions D2 and D3 have been registered.

- Educational models (D1)

Regarding the pedagogical models, the positively valued aspects represented 88.2% while only 11.8% were those negatively valued.

Four categories have been identified in this dimension D1: conception of an adequate educational model (C1), agent for design and implementation of activities (C2), use of spaces (C3), and use of technological resources (C4).

Generally speaking, the letters suggest the existence for the Spanish students of only two pedagogical models, one adequate and the other inadequate, with opposite characteristics (C1). The model considered adequate is globally identified with the terms transforming, renovating, innovative, active, practical, and motivating. It is related to a non-hierarchical or disciplinary teaching methodology in which the traditional final exams lose their evaluative function in the face of formative feedback. In this conception, teacher involvement and their potential to overcome difficulties, both during the project planning phase and execution one are highly valued. Teaching effort is particularly highlighted in relation to two aspects: on the one hand, with the scarcity of material and economic resources and, on the other

hand, with the low starting level of the students with respect to the official curricular syllabus. Consequently, it is assumed that, professionally, teachers with this profile will feel very satisfied when observing their achievements, compared to the scarce resources and the difficulties combined.

The specific activities of the environmental projects which were designed and carried out by the Argentinian students themselves (C2) have been valued in almost all the letters: great involvement and motivation as well as a parallel development of true teamwork, a sense of autonomy, and personal responsibility are remarked. In this sense, the letters showed there were two strategies most often considered as favourable. The first strategy consists of the intergenerational approach at school. Secondary Education students were the ones who designed and executed environmental activities for Primary Education students. This raised awareness and commitment to environmental protection in both groups and facilitated information and environmental knowledge acquisition. The second strategy was students' questions on local environmental research related to their daily life. They surveyed the population to collect their answers, an experience for the development critical thinking and environmental observation skills. However, this last aspect has also been valued negatively, since it meant that more activities would be necessary to promote students' critical capacity, especially from an opening of the local to a more globalized perspective, being more holistic and evidencing interdependent relationships.

The additional use of spaces other than the ordinary physical classroom (C3) is another highly valued aspect. Classrooms are connected to traditional and theoretical type of teaching. These additional spaces are related to motor-type activities entailing certain physical activity, and with a playful environment, where sensory stimulation, play and learning are combined. Therefore, it is not necessary to be sitting for long hours.

The use of technological resources in these environmental projects (C4) was another category that has been positively highlighted in the letters, although it has been widely recognized as a limiting factor in the event of a digital divide, when not all students have them, or when technical supports fail, something that frequently

happens. On the one hand, the use of the Internet for training for reliable information web searches is valued, knowing how to discern realiable from unreliable sources, a very important competence nowadays. On the other hand, it is noteworthy the fact that the use of different social network applications is clearly defended in the students' letters, either for internal group use (e.g., WhatsApp) and external use (e.g., Facebook, Instagram, etc.). The arguments repeatedly speak about the use of visual language, as more attractive than other formats for obtaining information, and the promotion of additional collaborative work through the exchange of information, ideas, and opinions in and out of school.

- Impact on the community (D2)

As regards the impact the projects generated on the community, the percentage of positively valued aspects was significant (90.5%) and there were some specific negatively valued (9.5%).

Four categories have been identified in this dimension D2: tangible actions on the local environment (C5), inter-institutional relations (C6), communication and dissemination (C7) and ideological components (C8).

The benefits for the local environment due to the actions carried out is unanimously valued in the letters (C5). Firstly, the positive impact of promoting actions to sort domestic waste and then, the increased volume of materials available for recycling in the village. Secondly, the contribution to the improvement in air quality by planting fast-growing species, which become carbon dioxide sinks.

The promotion of institutional relations (C6) among the school and other entities was considered highly desirable. The role given to this relationship is twofold. From an economic perspective, it is understood that local companies can provide the school with material resources the school is unable to obtain otherwise. From the social point of view, it was proposed that this relationship is an intergenerational human exchange of experiences, interests, and knowledge with a positive impact on community cohesion and dialogue on the environmental problems they face together.

The projects' communicative strategies (C7) were perceived as a great success, since the students themselves were in charge of carrying out most of the dissemination activities. Students became active social agents in their own community with their families as well as contacting important people they wanted to interview. It was suggested that this communication and dissemination could be enriched by holding an event inviting the schools nearby which could develop similar environmental initiatives, boosting, therefore, the impact of this project.

An ideological component was detected in 28% of the letters (C8). These were aspects of political thought related to anti-capitalist views, to anti-transgenic activists, concerned about the international trade related-freight transport responsible for the carbon footprint, and other ideas advocating for a self-sufficient agriculture. Obviously, these approaches admit many nuances. However, from this standpoint, the projects are valued positively because it was acknowledged that these ideas promoted the concept of "empowerment of the rural world".

- Scientific content on environmental education (D3)

In parallel to what has been described in the previous dimensions as regards the scientific content of EE, most of the codes in this section have matched with positively valued aspects (81.6%), although a slightly higher number related to negative evaluation codes (18.4%) has been detected in this dimension in comparison to the rest. In this dimension D3, two categories have been identified: selection of theoretical topics (C9) and selection of practical topics (C10).

The selection of theoretical topics (C9) has been considered as adequate in general terms, especially when putting into context the fact that they were aimed at schoolchildren. These theoretical topics were urban waste treatment, recycling actions, environmental camps, or groundwater purification. In some letters (23%) it was indicated that in the proposed actions there could have been an overuse of the theme domestic waste sorting. This dimension has also been valued in the letters due to the inclusion of infrequent personally experienced topics in EE as a discipline.

Among them, it is worth highlighting the holistic approaches, i.e., the complex processes on natural resources, such as the interrelationship of air, water, and soil subsystems pollution, especially from a focus on Chemistry when dealing with the issues of natural arsenic contamination and artificial contamination with pesticides.

Regarding the selection of practical topics (C10), the actions developed in the projects were valued positively, and useful for the local reality: purified water consumption and use of agrochemical products. This value is emphasized because an investigative application of the scientific method was expressly included for developing this project. In fact, these letters suggested some additional ideas for workshops on the same content. Nevertheless, some specific issues were evaluated negatively. On the one hand, the use of plastic bottles as outdoor flowerpots was questioned. The prolonged exposure of plastic to solar UV radiation results in photo-degradation, or mechanical abrasion producing microplastic contamination. On the other hand, considering the Argentine region, the use of allocthonous flora in the plantations was criticized, being the case of the kiri tree, Paulownia tomentosa (Thunb.) Steud.

Discussion and conclusions

Regarding the Educational Models (D1), the advantage of an adequate pedagogical model (C1) related to the hot model is highlighted. This development allows, in turn, an appropriate execution of activities (C2), use of spaces (C3) and use of technological resources (C4). The criterion shown by the authors of the letters to assess positively or negatively the pedagogical models underlying the didactic conception of these environmental projects was almost entirely based on their own experience as students/users of the Spanish educational system and not on a specific pedagogical training. This was inferred from the vocabulary used. That vocabulary did not reflect the "academic jargon" terminology, which would accurately express some of the pedagogical models described in the theoretical framework and to which students referred. Students spot transformative and innovative, non-hierarchical

teaching models as appropriate, in which the scarcity of resources or the low academic starting level did not pose a problem when teachers tried to teach, in the line of Pintrich et al. (1993) and Monroe et al. (2017). Students also valued that working for environmental projects encourages autonomy, responsibility, and teamwork which lead to greater motivation. Play-based learning activities were thought a great pedagogical option as Dieleman & Huisingh (2006), Edwards & Cutter-Mackenzie (2011) and Cutter-Mackenzie & Edwards (2013) also found. Having worked with local problems, leaving the classroom, using social networks and Internet search tools were also considered relevant aspects, as highlighted by Aguilar (2018). The analysis of the proposed dimensions allowed us to deduce that the appropriate pedagogical model would correspond to what Camilloni et al. (2007) conceptualizes as a hot model. It is recognized, therefore, that this project effectively promoted participatory, open, and permanent learning as evidenced by the projects derived from the original proposal. Thus, categories C2, C3 and C4 showed a strong association with respect to C1.

As for the Impact on the Community (D2), this key dimension was related to a perspective based on social issues. Concrete actions, the participation several institutions other than schools and the communication skills achieved by the students were regarded as relevant. The opinion of the students is consistent with Gough (2008), Hacking et al. (2013), Jongbloed et al. (2008) and Krasny & Roth (2010). These authors state that educational institutions are not isolated from their communities' socio-environmental problems; so, addressing young people's education turning them into social actors empowers them with autonomy to transform reality. An interesting aspect to examine was the emotional aspect in the assessment by the Spanish students, in terms of what they felt related to benefits for the local environment due to the actions carried out (C5). Singh et al. (2020) showed that students' parents are influenced and even learn about environmental problems through their children, being more influential their adolescents concerns than their disciplinary knowledge. On the one hand, in this dimension external funding sources coming from companies was not criticised (C6). Probably, since they were locally

owned companies -not perceived as multinationals- this data was not observed by the Spanish students. On the other hand, however, elements of ideological contestation were revealed in the letters. These elements showed interests in deepening reproduction, social inequalities, and hegemonic domination (C8). The aim of this type of project allows the development of a reflective and critical consciousness (AGUILAR, 2018; PAUW et al., 2015). In this sense, schools can be the place where feedback for inadequate environmental social behavior reproduction is obtained or the place where society can start a change (Bogner, 1999). Schools can become pockets of resistance to generate new ways of teaching and learning, thus determining a new social justice (GIROUX, 1983). In this way, the educational environment becomes a place of dispute on interests and ideological positions.

Regarding Scientific Contents (D3), disciplinary content was considered important by the Spanish students, both in theoretical (C9), as well as practical issues (C10), producing different appraisals for the developed projects. Because the participants had an extensive university academic training on scientific content related to Environmental Sciences, the use of appropriate terminology was observed. They also exposed approaches beyond the educational projects' objectives which go into professional technical questions on environmental management, with particular interest in chemical issues, that many authors have shown to be relevant (BURMEISTER et al., 2012; SEVIAN & TALANQUER, 2014; TABER, 2013). However, at times, some approach biases have been detected, such as the consideration of the anthropic origin for arsenic groundwater contamination. In this case, despite the general positive feedback, it was the section with the most negative criticism, identifying: (a) emphasis on waste sorting instead of waste reduction, (b) the introduction of non-native species such as the kiri tree or (c) the lack of holistic approaches were some of the problems raised. It should be noted that the criticisms students raised (Tai et al., 2017) have a strong imprint of the Science-Technology-Society (STS) approaches, and the American and European different traditions could be noticed (AUTIERI et al., 2016). EE is understood by them not only as an area of

academic learning but also of social, political, and pedagogical construction in line with the social issues approach developed by Rosenthal (1989).

Finally, this study also yielded a disturbing conclusion related to degree of familiarity about Sustainable Development Goals in the population considered. The students of the Degree in Environmental Sciences of the University of Granada (Spain), authors of the letters analyzed, did not include in their texts' framework of the 2030 Agenda or explicitly name/relate any of the SDGs with the projects. This can be because these students do not confuse environmental education and education for sustainable development (JICKLING & WALS, 2008) or that they do not have proper knowledge on SDGs, since this curricular content would be introduced to them months after the letters had been written.

All these conclusions lead to the idea that for environmental education to be socially beneficial it must include scientific concepts addressing local aspects without neglecting the framework of global problems.

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