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# WORKING ENVIRONMENTAL EDUCATION WITH TEACHERS IN TRAINING

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### *Abstract*

Contents of the subjects of Didactics of Experimental Sciences should include attitudes and behaviour towards the environment. Then, aspects related to the consumption of water in the production of certain foods and other products of daily use such as paper, or oils have been worked with teaching students. As well as their routines regarding recycling and water consumption. It is desired to quantify the degree of learning achieved in the learning realized from the activities carried out and to find out the satisfaction of the students with the realization of the proposed activities and the degree of acquired competences. The proposal has been carried out with students (63 students) of the Childhood, Health and Food subject of the 2<sup>nd</sup> grade of Teaching in Early Childhood Education of the Faculty of CCSS and Humanities of the U. Zaragoza. As methodology tools, practical laboratory lectures (practical work, 10 laboratory sessions of 2 hours, in pairs), debates, visits to industries and a questionnaire inspired in the proposed one in the Water Footprint Network. In this questionnaire, students review the habitual behaviors regarding water consumption, which in turn is reflected in a global behaviour, developing a thought about how individual behavior affects the global state of the planet. These activities have been shown didactically useful in terms of meeting the proposed objectives. It is expected that the results and conclusions will be of interest to the university community, and training in Environmental Education would be considered as a transversal issue to work.

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**Keywords:** Environment, Education, Teachers in training.



## 1. Introduction

Politically correct environmentalism usually refers to pollution, the exhaustion of resources or recycling and the health of people living in developed areas. Our planet is seen from a perspective of what can affect the living conditions of the developed world, not overmining the excess exploitation of the environment. However, there is another approach to environmentalism. It focusses in the deep, for which man, as a species, cannot be separated from the whole, a formulation by which it is placed at the center of thought to nature and not to people (Naess, 1973; Sotolongo & Delgado, 2006). The study of Kang, Grable, Hustvedt, and Ahn (2017) found that some water beliefs (perceived drought severity) were not significantly related to sustainable water consumption while others (utilitarian water belief, ecological water belief, and water resource concern) did show significant relationships either with attitude, subjective norm, perceived control, and moral obligation toward sustainable water consumption or with behaviors related to sustainable water consumption. Regarding the training of educators, it would be fundamental to understand the basis of these two previous approaches, and it is desirable that regardless of the opinion of each individual towards the conservation of the planet, it would be able to argue which of them is considered better for the planet Earth and its inhabitants, current and future. Specifically, one of the factors to work with students of any age and relevant to our daily behavior in favor of the environment is the consumption of water. Although at the time of working environmental problems, we must do it in a planetary way, we must not forget that the first education has to attend to the physically close and our daily behavior, which can also affect globally. According to Çakır Yıldırım and Karaarslan Semiz (2019), the pre-service teachers of Turkey are aware of the consequences of their actions on water resources and they accept responsibility towards unsustainable water consumption; they also had a sense of moral responsibility to save water. Theirs results, parallel with those of several previous studies, suggest that biosheric-altruistic value orientation leads to increased awareness of the consequences of water conservation and a greater sense of responsibility for sustainable water use. Furthermore, an increased sense of responsibility leads to an increase in personal norms for sustainable water use, which in turn leads to an improved sustainable water consumption behaviors.

In Spain, Integrated Management of Water Resources includes management and coordinated development of water, land and related resources, in order to maximize the resulting social and economic well-being in an equitable manner, without compromising the sustainability of vital ecosystems. To carry out this management, it is necessary to coordinate supply and consumption, and at the same time, in a respectful way with the available means, that is, with the environment. If Harlem and its collaborators are taken up again by coining the concept of "Great Ideas" in which to focus the essential curriculum of sciences for compulsory levels of education (in science content), consider that a citizen / he must understand the natural world that surrounds him must be able to "[...] take part in science-based decisions that affect his own life and the well-being of others" (Harlen, 2010, p.18). Fugitive news in the mass media shows mass movements of young people who demand that the planet be preserved for the new generations by decreasing consumption. It is essential that each to analyze what should be done and demanded to governments. It should be considered that in teacher training there is a double relevance in the configuration of behaviors given that their profession focuses on educating boys and girls at an age in which knowledge is strengthened but also attitudes and values. Precisely in those years in which, in many cases, habits and customs are

acquired that will accompany us throughout life and that are very difficult to modify later. In this respect, is shared with Perrenoud (2012) the fundamental idea that future teachers must be trained to make responsible decisions.

## **2. Problem Statement**

The University of Zaragoza, is immersed in projects to implement actions that lead the Institution itself, as well as its components, to achieve sustainable behaviors. In fact, it has joined committed projects such as the 2030 Agenda "from intentions to actions" (commitment to evaluation before ECODES), Work Agenda established by the United Nations on the fulfillment of 17 Sustainable Development Goals (<https://oficinaverde.unizar.es/agenda-2030>). To carry out any action that compromises favorable attitudes in favor of the environment, it is necessary for the person to build content, either collectively, that commits the individual as a constituent of a common opinion group, but also individual learning that facilitates and allows the taking independent and reasoned opinions and therefore behaviors.

Reviewing the individual, daily or habitual behaviors, which in turn is reflected in a global behavior, develops a thought about how individual behavior affects the global state of the planet. Likewise, the detection and acceptance by the teaching students of the acquisition of competences that enable them to understand the importance of responsible water consumption directly and indirectly and build a better meaning for the concept of sustainability. Together with this, to emphasize the consumption of water from the production and preparation of the products has led to a better use of the activity. Also, practical activities in which the water expenditure factor and its footprint on the planet have been introduced, have had important connotations in learning and awareness.

In the subject "Childhood Health and Food", we mainly work on contents related to concepts but also to procedures, attitudes and values. All this to achieve a favourable attitude of the students, which helps the construction of knowledge and to have behaviours that are considered by the communities, at this moment, as better for the welfare of the people. The project has been carried out with three groups of students, morning and afternoon (sixty-three students in total) of the mentioned subject of the second year of the Teaching Degree in Early Childhood Education of the Faculty of Social and Human Sciences of the University of Zaragoza.

Research questions are presented in next section.

## **3. Research Questions**

In this research, we answer these interrogates:

- Is it possible to improve the competences of the students of the Teaching Degree in Early Childhood Education, in contents related to sustainability and responsible consumption?
- What is the degree of improvement achieved in the learning made from the activities carried out?
- How much satisfied are the students with the realization of the proposed activities.

#### **4. Purpose of the Study**

It is desired to improve the competences of the students of the Teaching Degree in Early Childhood Education, in contents related to sustainability and responsible consumption. It is desired that those students give a sense to the behaviors performed every day, assessing their impact on the environment. Then, they are able to debate through arguments based on theories and scientific and social principles. This project aims to improve the skills of students of the Teaching Degree in Early Childhood Education, necessary to understand certain science content. These contents are related to respect the environment and the responsible use of water not only for the consumption directly but also for indirect consumption, through food and other elements that are part of your life. Also quantify the degree of improvement achieved in the learning made from the activities carried out and find out the satisfaction of the students with the realization of the proposed activities. Finally, it is wanted to know the degree of acquisition of the competences. With the conclusions obtained, proposals can be made for the improvement of the subject, activities, contents to be worked on and the methodologies used, all this can help the reflection of the teaching staff.

#### **5. Research Methods**

Through a pre-test (Google questionnaire) the students were asked about their hygiene habits, domestic consumption, etc. in activities that necessarily involve directly or not, water consumption. We used the modified Water Footprint network questionnaire (available at <http://waterfootprint.org>.) Questions about water consumption in the elaboration / manufacture of specific food products were included. The results of the surveys were worked on in class as a first instruction in which all aspects leading to the personal and collective water footprint were valued.

Likewise, classroom and laboratory activities have been carried out involving students through research (methodologies of inquiry in different degrees) about the presence of water in certain foods and calculations about the water necessary for the products to reach the consumer (Water footprint). Two exits have been carried out, one for the agricultural industry of the agricultural Primary Sector and the Secondary Sector (potato chips and cheese manufacture industries) typical of the geographical area where the faculty is located.

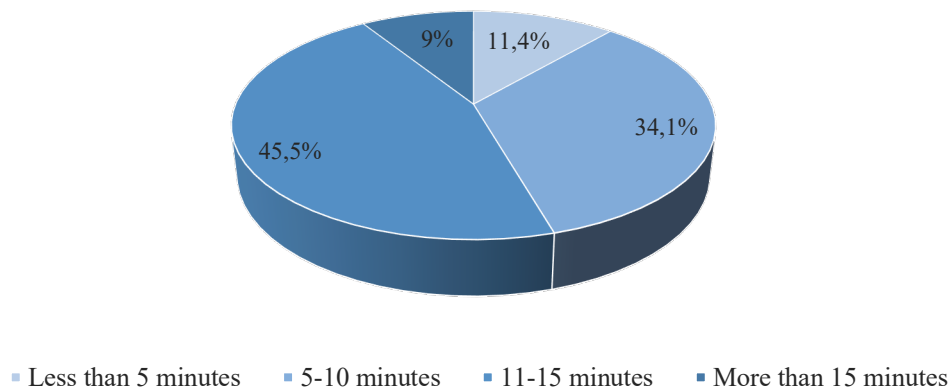
#### **6. Findings**

Regarding the results obtained in the pre-test, it is worth highlighting the time dedicated to the shower and the presence of accessories that reduce water flow (Figure 01). All use the washing machine to wash their clothes being the majority those who wash twice a week (48%). Students value positively the opportunity to discuss about these contents. They considered relevant to work water consumption routines in the classrooms of all educational levels. And they gave value to individual behaviors, small gestures to maintain the environment. But they also consider the relevance of the industry, tourism, gardens, etc., that is, other behaviors that are outside individual actions.

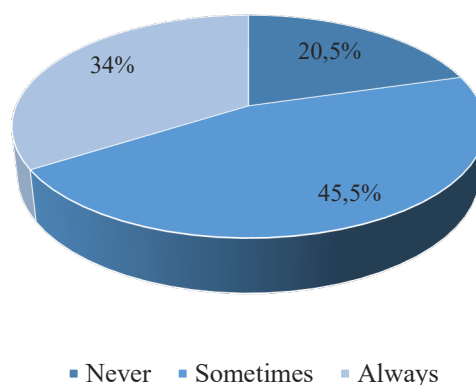
Regarding the questions related to the amount of water needed for production of various foods, students were surprised by the large amount of water necessary to produce / manufacture some common

foods. The students' attention is drawn to the need to count as consumption of water for the manufacture of a food, the irrigation of the cow's food, or the consumption of water linked to the transportation and cleaning. It is also revealed the lack of construction of precise meanings of concepts such as return, recycle, or renewable. The most common responses are those related to the response that is recycled a little, which has to be considered negative (Figure 02). On the other hand, it becomes clear that it is not known in general what are the recycling procedures, their limits, which products are made of recycled materials, etc.

It can be affirmed that the students of the Teaching degree want to work with your future students problems related to the preservation of the environment, but from a confused personal situation, because they do not they practice to a great extent and because they do not know the advantages or disadvantages of processes that should defend against their students. Regarding the activities carried out, they consider that the experience has been positive. It is expected that they will be fruitful in a medium or long term.



**Figure 01.** Time to take a shower (% of answers)



**Figure 02.** Recycling paper (% of answers)

Conclusions are summarized in next section.

## 7. Conclusion

Results showed that students' knowledge of Early Childhood Education about the repercussions of consumption, in the maintenance of the quality of the environment, is clearly improved. However, they do not realize about the impact of current consumption habits on the permanence of a quality of medium acceptable to future generations, including recycling. The social movements, business movements and advertising that throw smoke screens with large economic means, do not help the survival of the environment, but are considered harmful. The current movement related to the so-called "circular economy" is exclusively business, which at no time considers the decrease in consumption, but on the one hand promotes the recycling of materials without making a serious assessment of energy consumption. It encourages consumption behavior of products that are geographically close, in which sometimes the health achievements achieved in recent decades crumble, such as the consumption of natural milk, without pasteurizing or sterilizing. It is an example of the difficulty to train citizens to address the great problem of the population, the massive movement of people from one part of the world to another and the economic and social imbalances, of life possibility, between some settlers and others. Regardless of whether this activity has been carried out with specific students, it is necessary to reflect on the graduates, the citizens and the superficiality of the training of the trainers, ..., or entrepreneurs or leaders of the future. For the evaluation of the results of the activities carried out this academic year it is planned an evaluation, doing activities in the next course with the students who have done the tests and learning activities this academic year. The application of the results would be incorporated, if possible, to the teaching of the subjects of the area of Didactics of Experimental Sciences of the University of Zaragoza.

Although the literature indicates that younger people are somehow more environmentally concerned than adult individuals, a deficit in future orientation could delay the development of a sustainable way of life (Corral-Verdugo & Pinheiro, 2006). It is necessary to conduct more studies within the context of sustainable water consumption to produce additional theoretical and practical results and there should be environmental and sustainability courses in the elementary education (Çakır Yıldırım & Karaarslan Semiz, 2019).

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