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PERCEPTIONS IN PRIMARY EDUCATION: WATER AND ITS
IMPLICATIONS FOR ENVIRONMENTAL HEALTH

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Abstract

This study introduces the first stage of an investigation which aims to gather the assumptions, skills and attitudes towards water of a group of third cycle primary students. The investigation is carried out in a neighbourhood on the coast in Malaga, Spain. The aim is to discover perceptions of water, comprehension of concepts that relate to water, and to reflect on the knowledge acquired during this stage of education. Based on the insights of the study, a didactic approach will be designed that encourages understanding and awareness of the environment. The context is presented as a hypothetical situation where students will have to respond to the inhabitants of another planet. Two methods of information gathering were proposed. One using written expression as a medium, and the other using artistic expression, both creative in nature, and adapted to the theme and level of study. The results show several typologies of knowledge and concepts of water, the environment, and environmental health. The diverse ways of perceiving water should be held in account for future didactic proposals for education and for environmental health.

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1. Introduction

Given the high capacity for learning and comprehension of habits presented at this stage, school sets itself as a major setting for the development of health education; pupils are developing physically, mentally and socially during this period. The schooling period is one of the stages most studied by educational scientists as it is considered a fundamental part of human life. Fundamental attitudes are acquired during infancy through the shaping of beliefs, and development – which starts at birth – does not only happen according to biogenetic laws, but also to diverse environmental and experiential factors.

According to the Scottish Health Education Group of the World Health Organisation, Schools have the responsibility of providing students with sufficient information about health. Schools should also help students overcome certain behaviours, and understand the values behind healthy choices, and encourage them to make these choices (WHO, 1986).

The importance of school as a medium for the promotion of health is recognised by the creation of the Schools for Health in Europe network, integrated as part of The WHO Regional Office for Europe, the EU Commission, and the Council of Europe. Its goal is to facilitate the educational community in the adoption of healthy ways of life and provide a positive and healthy environment. There is a correlation between good health, educative performance and completion of studies. There is also a well-established relationship between school environment and improved health (Cohen et al, 2006). These relationships show that increased efficiency of one sector can potentially benefit another, making schools an important place as much for education as for health.

Furthermore, School for Health in Europe (SHE) provides support to organisations and professionals regarding the design and upkeep of health education in schools. This network has inherited its strong foundation of experience from its predecessor, The European Network of Health Promoting Schools (ENHPS). This foundation has led to the joint strategic work of the education and health sectors.

Today, the coordinating body of the network of Schools for Health in Spain is the Institute for Teacher Training and Educational Research and Innovation, of the Ministry of Education.

Moreover, health is intimately linked to the environment in that it influences our health. This is reflected in the concepts of Ordoñez (2000), Piedrola and Del Rey (1991) and Prüs-Üstun and Corvalán (2006). Our health is a result of environmental factors as well as others that, as established by Lalonde (1974), could be biological, due to lifestyle, or due to factors within the public health system. Environmental health and environmental factors which contribute to personal and collective health are discussed, as well as the prevention of illness and the creation of nurturing, healthy environments (WHO, 2003; Ordoñez, 2000).

Schools support the promotion of health and development of infancy, childhood, family and the educational community, and there is growing evidence to support the greater effectiveness of health programs that include health development activities, that have a global approach to school, and that implicate activities from more than one sector. These approaches help create surroundings that encourage physical, social and educational support.

Dubos (1967) establishes health as the temporary state of adapting to environment and the ability to function in the best conditions therein. He understands health as the balance between individual and surroundings, and the product of an imbalance as illness. On the same lines, the WHO (1984) Regional

Office for Europe states that health is the capacity to realise personal potential and respond positively to environmental difficulties.

2. Problem Statement

Water is a primary area of interest for both school and on a global scale. Statements agreed at the Summit of the Americas and the Dublin principles corroborate this and aim towards sustainable use of this resource. Despite its importance, water is one of the least efficiently administered resources in the world, being contaminated and wasted without thought to potential consequences. It is necessary to promote the development of environmental values, and address water from an educational perspective (Castelltort & Sanmartí, 2015). Pardo-Buendía (2000) considers that involving students with water through education is essential for the promotion of changes necessary to achieve long-term conservational and sustainable use.

Some studies aim to affirm that the level of participation offered to students in this subject area is reduced or non-existent (Vázquez del Mercado, Goodman, Teko, & Denni, 2006). It is therefore fundamental to make participative educational proposals that advance the child's awareness of the responsible use of this vital resource.

3. Research Questions

Water is among the most important natural resources for humanity and a fundamental condition for life and the development of society on earth. Knowledge and awareness of this should be developed from an early age and with a constructivist approach. Learners should consider themselves an active part of the knowledge-building process, utilizing their prior knowledge to make sense of the unfamiliar (Porlán and Martín de Pozo, 2006). Studies on water and pupil understanding of water from different perspectives, however, are limited in number. In answer to this, the research asks the following question:

What perceptions of water, environmental health and hygiene are held by students in the third cycle of primary education?

4. Purpose of the Study

In this stage of school, pupils gain knowledge and form healthy habits that last a lifetime. As such, it is very important to develop the understanding needed to live a healthy life in their closest natural environment, and design and implement teaching models that increase awareness through health education. We have devised the following objectives:

Gather prior assumptions of water, environmental health and personal hygiene of pupils in the third cycle of primary education by way of a challenging scenario.

5. Research Methods

By providing a challenging scenario we hope to gather and understand the relationship of interdependence between pupil and water. We hope to expose the pupils' prior knowledge of water, the water cycle, daily uses, hygiene, health, concerns of contamination and the treatment thereof. A

questionnaire was designed using a Likert-type scale comprising of 15 closed questions, which was presented to a model sample of 100 pupils that were at the same level of education and with similar characteristics. This was performed as a pre-study to test comprehension of the task. Furthermore, the teachers of the pupils were asked for their opinion on the same subject matter. Age, gender, course and group statistics were recorded.

By linking health, environment and water, we hope to present an activity to pupils that will demonstrate their knowledge of water resources creatively through the writing of a letter, and later reflect this knowledge in a drawing.

According to Sequera (2006) children are naturally creative; it's more a case of stimulating creativity than of teaching it since a child is capable of creativity in any given subject area.

As well as this, in the words of Marín (1984): "[...] Creative activities are those that incite divergent thinking, those that invite personal expression and fulfilment. They are open tasks that, in their multiplicity of possible answers, stimulate everyone to choose the most appropriate path for their ability, interests and environmental demands" (p. 54).

The writing task is intended to allow the pupil to communicate their knowledge of water and its importance for health and the environment.

Hayes (1996) tells us that he understands writing as a communicative act which requires a socio-cultural context and a medium which is considered a creative activity that requires motivation, and an intellectual activity that demands cognitive process and memory.

From a social standpoint, written language is the product of culture, and differences in form and in use should be internalized and taught so that they may serve as a means of communication and allow for interpersonal communication through the production of texts. Written language is social due to its origin in spoken interaction (Vygotsky, 1977) and for its dialogic nature (Bakhtin, 1982). The shared sociocultural context permits this interaction and makes communication possible.

Additionally, the artistic drawing task hopes to reflect what is expressed in the written texts. Keeping in mind that pupils in the third cycle of primary education -11 to 13 years- have a greater critical awareness of themselves and consequently their creativity on a plastic language level shows a decline. This notion comes from Luquet (1978), who analysed development of drawing in children.

With this research we hope to reach the objectives with 93 pupils in the third cycle of primary education. The means of information collection was designed with respects to the socioeconomic situation, and attitude towards study of the participant, and according to their contextual learning model. The schedule of the school year was also accounted for.

Two tests were posed to the pupils, a written exercise and an artistic representation of the written concerning water, health and environment. A qualitative analysis was carried out on the data. Response patterns were sought that showed typologies of understanding and knowledge related to water, the environment and environmental health. The analysis was carried out using the program Atlas.ti.

6. Findings

93 letters and 93 drawings from students in the third cycle of primary education were analysed (48 from 5th grade and 45 from 6th grade). The textual and pictorial material generated a total of 166 sources.

From these, 5410 units (quotations and image elements) were selected that were categorised using 481 codes. The analyses followed categorization processes and conclusions were drawn using matrices and comprehensive graphs (Miles, Huberman, & Saldaña, 2014). Table 1 shows the categories, subcategories and codes that organize water into Health (S), Health and Hygiene (SH) and Environmental Health (SA).

Table 01. Codes and examples of quotes from the categories related to water and health (W).

Codes	Subcategories	Categories	Verbatim quotations
SP	Personal Health	Health (S)	“Water keeps us hydrated” (P15: 2, 6:6)
HnS	Unhealthy Habits	Health (S)	“You can’t drink unsafe water” (P11: 4, 6:6)
HS	Healthy Habits	Health (S)	“Water is for drinking and showering...” (P50: 3, 8:8)
fSH	Lack of Health and Hygiene	Health and Higiene (SH)	“Take a shower every day or you will get sick...” (P2: 24, 31:31)
IsS	Impact on Health	Health and Higiene (SH)	“Wash your hands before eat...” (P2: 24, 31:31)
MAS	Healthy Environment	Environmental Health (SA)	“Don’t throw things into the toilet bowl...” (P2: 24, 31:31)

The development of this classification system along with subcategories and codification, and based on the literal expressions in the raw data, proved relevant for understanding how participants view the relationship between water, environment and health. Their ideas and assessments shape one or more thought structures that allow the creation of a cognitive map of relationships between concepts.

The three principal categories were defined as: Health (S), Hygiene (SH), and Environmental Health (SA). The subcategory health, as seen in table 1, comprises of: Personal Health (SP), Unhealthy Habits (HnS), and Healthy Habits (HS). Personal Health (SP) brings together references to the influence water has on the health of people including: water and environment; water and health; and the water we drink. Unhealthy habits (HnS) deals with behaviour relating to water that the participants deem inappropriate for a healthy lifestyle. These include: negative attitudes towards water; negative impacts owed to bad use of water; and wastage. Healthy Habits (HS) are behaviours relating to water that participants deem necessary for good health. These include: positive attitudes towards water; health benefits; and daily habits such as washing, showering and staying hydrated.

The subcategories defined for Hygiene (SH) are: Poor Hygiene (fSH), and Impact on Health (IsS). Poor Hygiene (fSH) includes but is not limited to: issues concerning unhealthy consequences of poor hygiene; water shortages; lack of supply; socio-environmental problems; and unsustainable use of water. Impact on Health (IsS) addresses questions such as: suitability of water sources for consumption; suitability for health; potable and non-potable water; and man’s interaction with nature. Finally, within the category of Environmental Health (SA), the most relevant subcategory is Healthy Environment (MAS). This subcategory includes: water in nature; clean water; therapeutic benefits; the beauty of water; the enjoyment of water; and natural ecosystems.

7. Conclusion

The qualitative analysis has led to understanding of relationships between water, environment, and health. To study the relationships between the concepts, this research has focussed on the categories Health, Environmental Health, and Hygiene. These have shown to be the most relevant categories for the organisation of the system. When asked to explain to the inhabitants of another planet what water means to them, the children of 5th and 6th grade turn to health. This can be observed in figure 1, appearing at the centre of their ideas. To the right of the figure we can see how health relates with environmental health, and how both are influenced by a Healthy Environment. A healthy environment with clean and clear water that can be enjoyed influences environmental health as well as health in general.

Health and hygiene relate directly and indirectly through various subcategories, as shown in figure 1. One such category is personal health and its derivatives: healthy and unhealthy habits. Students from primary grades 5 and 6 are conscious of the importance of personal health and the existence of habits that favour health and others that do not. Opinions of these habits do not prove that the students identify them correctly, but that they are conscious that there is a series of appropriate and inappropriate habits. As shown in the figure, habits deemed unhealthy (HnS) are related to poor personal hygiene (fSH) and with possible impacts on health (IsS). Hygiene is another important category for the analysis of perceptions of water held by primary students.

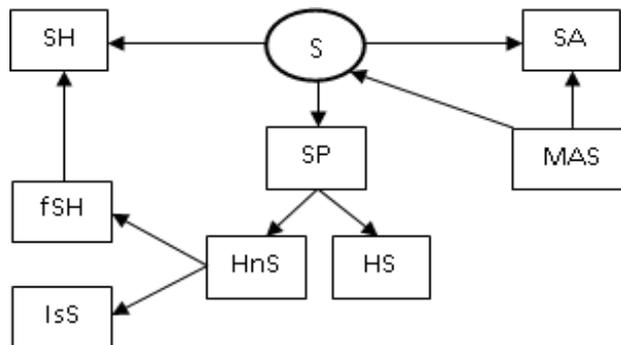


Figure 01. Relationships between the categories Health (S), Environmental Health (SA), Hygiene (SH) and relevant subcategories

Students of primary education make strong links between water, environment and health with hygiene and environmental health. Figure 1 acts as a comprehensive framework for the analysis of the way students conceive their relationship with water. The framework presented in figure 1 will allow for continued study of understanding that students demonstrate through artistic and written expression. The initial approach to the qualitative analysis has demonstrated its utility as a tool for insight into assumptions that students in the third cycle of primary education have about water, environmental health and hygiene.

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