A STS analysis of the Portuguese national Chemistry syllabuses at the secondary level

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Since the 1960s the image of Science has been tarnished by a succession of scientific and technological developments with unforeseen environment and societal consequences, such as CFCs and the depletion of the ozone layer and global warming. In addition, scientific developments have led to public unease about their implications, such as the effects of radioactivity in human's health.
There is a large consensus that to sustain a healthy and vibrant democracy, such issues do not require an acquiescent (nor a hostile or a suspicious) public, but one with a broad understanding of major scientific ideas who appreciates the value of Science and its contribution to our culture and is able to engage critically with issues and arguments which involve scientific knowledge.
Individuals should be able to understand the methods by which Science derives the evidence for the claims made by scientists, to appreciate the strings and limits of Science evidence and to recognise the ethical and moral implications of the choices that Science offers. School Science (Chemistry) education should aim to provide a public who are comfortable, competent and confident with Science, and with scientific and technical matters and artefacts, in which Chemistry knowledge also as a part. .Not to have some understanding of them is to be an "outsider", excluded from elements of our common culture in much the same way as a person who is unable to read. Teaching Science (Chemistry) should enable young people to become scientifically literate – able to engage

with the ideas and views which form such a central part of our common culture -. The Science (Chemistry) curriculum should provide sufficient scientific knowledge and understanding so that students could read newspaper articles about Science, follow TV programs on new advances in Science with interest, express an opinion on important social and ethical issues with which they will increasingly be confronted and act as a informed citizens.

On the other hand, we need, as a society, to train and educate new generations of scientists and technologists to maintain the technological tools and systems we value and to develop new and better ones to meet new needs and solve new problems. School Science is, for some young people, the start of the process which will enable them to become the scientists and technologists of the future.

There are many factors that condition what one teaches and what students learn, but syllabus are certainly important because they organise all the teaching and learning process.

Admitting that teaching Chemistry in a STS perspective (Science/Technology/ Society) is one of the ways that is seen as promising so that it stimulates the students interest by learning Chemistry, where the contents are assumed as relevant in order to give a meaning to the themes/problems. Moreover, admitting that at the same time it prepares the pupils to act as future informed citizens, we have built an analysis instrument, based on the present STS international orientations, in order to analyse the actual Portuguese Chemistry syllabuses at the secondary level.

The results allowed us to conclude that the predominant aim of them is to provide a basis of knowledge for future specialists in Science. However, the current emphasis-presenting Chemistry syllabuses, as a body of knowledge which is value-free, objective and detached from reality, i.e. a succession of "facts" to be learnt, with a lack of contextual relevance to the future needs of our students, doesn't empathize how Chemistry knowledge has transformed the world we inhabit and our lifestyles. The syllabuses can appear as a "catalogue"

of ideas. There is an over-emphasis on content. The breadth and extent of Chemistry knowledge make the choice of relevant and forever actual contents as inevitable. There is a big agreement that we_should resist the temptation to include too much and so to avoid ending up with a content-dominated syllabus, which leaves insufficient time for discussion, reflection and analysis. In other words, one should teach less to teach better.

Key words: Chemistry syllabus; CTS Chemistry teaching