

# Chemistry in YouTube: the impact of experiments on views and diffusion degrees of videos in Portuguese and Spanish

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## Abstract

A survey of the chemical content in Portuguese and Spanish available in the YouTube portal is presented (2015). Correlations between video content and diffusion were drawn and discussed. The study indicates that displaying chemistry experiments positively affects diffusion records of the videos.

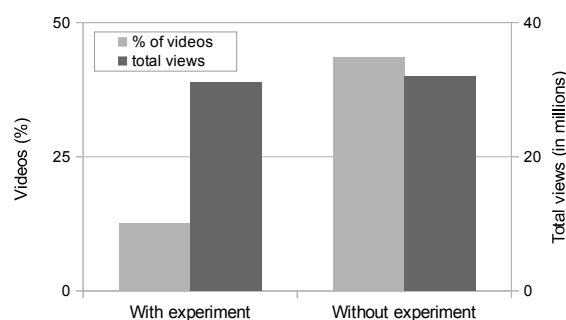
## Introduction

Currently, YouTube stands out as the main social media for video sharing. Indeed, the portal has been intensively used as a major channel for chemistry dissemination and education.<sup>1</sup> Several video-based learning resources are available, posted by students and teachers.<sup>2,3</sup> Videos featuring chemistry experiments have been used as an alternative or as complementary resources to wet lab classes.<sup>4</sup> This work presents a comprehensive survey of YouTube videos in Portuguese and Spanish. Factors that influence video diffusion were drawn from the video data profile.

## Results and Discussion

Universe: 733 videos were selected from a broad search with the keyword "química". Results were sorted by access count and tagged in respect to 13 conceptual categories. An information diffusion parameter was established for each content category by normalizing the total video access count by the time a given video was available online. This allowed direct comparisons between videos with different access patterns (i.e. access peak, steady access growth, season access etc.). Data correlational analysis was performed. The following global results are highlighted: i- 44% of the videos were regarded as non-related to chemistry itself (i.e. the "chemistry between us"); ii- 12% of the videos are related to chemistry and present experimental activities (Figure 1). iii - videos showing experiments have the highest degree of diffusion compared to those without experiments. Regarding videos with experiments, it is noteworthy that: iv- 57% of the videos last 3'-6' and 49% possess audio narration; v- the most widespread videos are those lasting 7'-10' and displaying text and audio narration; vi-

experiments are explained very superficially, only 22% of them address microscopic and/or symbolic levels of chemistry; vii- almost half of the videos were not posted by institutions related to education in any level; viii- teachers are the protagonists of the most widespread videos, however, in only 14% of the videos a teacher is the main character; ix- often, videos posted by students are related to homework; x- 54% of the experiments employ affordable and ordinary materials; xi- videos showing complex or dangerous experiments are among the most viewed; xii- connections to everyday life are present in 37% of the videos, however this is not related to high diffusion degrees; xiii- oxidation-reduction (combustion included) is the most common concept, but the most widespread videos feature the concept of chemical equilibrium.



**Figure 1.** Total views for the chemistry related videos. Percentages correspond to the total analysed videos (n=733).

## Conclusions

Experiments positively increase the diffusion degree of YouTube videos on chemistry in Portuguese and Spanish. They commonly last up to 10', are not posted by teachers, schools or universities and provide a superficial conceptual explanation for experiments.

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