

# VIDEOS AS A LEARNING SUPPORT TO IMPROVE MATHEMATICS EDUCATION. I. ADVANTAGES AND METHODOLOGY

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## Introduction

Videos can be an effective teaching aid in the classroom for any discipline. This seems very evident in experimental sciences, but in relation to mathematics this fact is not so clear. With regard to videos on mathematics, at the beginning of the eighties they had a dense structure, developing their contents in a rigid way, with the result that the interaction with the students was not favoured. Nevertheless, this is very different nowadays.

The arrival at the Spanish market of a large variety of mathematics videos from other countries has allowed the teachers to have an audiovisual material with enormous educational possibilities. Nevertheless, due to the large diversity in relation to the objectives pursued by commercial videos (education, aesthetics, entertainment, etc.) and in the level of difficulty with which some subjects are dealt, the adaptation to the present curricula is very limited. So, the teacher, on using videos as educational resources, must consider a work methodology suitable for extracting all those educational possibilities.

When videos are specifically used in a particular context of the curricular design, they can acquire a different meaning from the one expected by their authors. In this way, one must bear in mind that the students will normally tend to passivity when watching TV and movies; therefore, it is of fundamental importance to carry out some activities previously prepared, in order to eliminate this risk of passivity and to get from these aids something more than a simple entertainment.

## Objectives

If a video is considered as an educational resource, one must look for those contexts in which it is possible that the students -and the teachers also- interact with that video. That is to say, it is necessary to devise curricular designs in which, in the sequence of programmed activities, the way of watching the video and the moments to do other collateral activities will be perfectly defined.

In the workshop of audiovisual aids the teachers should learn how to systematically use videos in the classroom. Thus, they will be able to extract the maximum of their educational potential, following some key educational guidelines.

## Methodology

The teacher who is going to use a commercial video must follow a guideline of personal work before watching it in the classroom in order to adapt the contents which are present in videos to the students and favour their learning process.

### *To analyze basic ideas of videos:*

First of all, it is necessary to find out the main ideas, expressed either by assertions or experiences of daily life, which are present in the audiovisual material selected. So, the professor can define the concepts which are implicitly or explicitly in the video.

### *To determine previous ideas of students:*

To prepare a questionnaire for the students may help the teacher to know “what the students think” about the concepts which are shown in the video. Thus, the teacher can influence previous ideas which could be hypothetically modified by the video.

### *To insert the contents of videos in the Curricular Design:*

The guidelines which the teacher must consider in order to create a curricular design which integrates as an activity to watch a video, are the following:

- *Objectives of the curricular design.* The objectives of the didactic unity must be emphasized in order to know if the video facilitates to achieve them. The teacher must underline the objectives which are going to be favoured by the video and determine if specific activities are essential in order to effectively reach these goals.
- *Contents of the thematic unity.* A network of the contents of the thematic unity and another one of the contents of the video must be prepared in order to contrast them and decide the more adequate didactic moment to present the video.

- *Sequence of activities.* Once the teacher has decided the moment in which the video is going to be presented, it must be designed the sequence of foreseen activities for the video to be clearly contextualized and integrated.

***Possibility of linking the contents of videos with the History of Sciences, the History of Mathematics or the History of the World, as well as to establish the relations between Science/Technology/Society:***

This historical and philosophical approach must be prepared in collaboration with the professor of Social Sciences, Philosophy, History, etc, depending on the working level.

This historical component may be dealt in different ways:

- As a motivating introduction to the video. Exposition of interesting, outstanding, or curious data connected with the subject selected.
- As a starting point of simultaneous activities carried out only by those students who are interested in a historical moment or want to research into some historical figure or specific period.
- As personal contributions during the showing of the video, stopping it when an idea -being formerly either wrong or correct- appears.
- As a complement to clarify previous ideas which are wrong and that may come from a deeply rooted historical idea.
- As a means to extract scientific terminology and study its origin.

***Complementary activities and educational resources that can be extracted from watching:***

As a complement to the video and its contents the teacher can propose a series of didactic resources, such as:

- Interpretation of news, graphs, etc in daily newspapers
- Complementary videos
- Compilation of data
- Complementary bibliography
- Computer programs

***Ways of evaluating what it is learnt by students through videos:***

- The teacher can elaborate a evaluation questionnaire with two or three levels of difficulty as far as questions are concerned.
- The students should do a teamwork in order to ask their own questions which would be solved in a further oral meeting.
- There should be an educational evaluation by sharing the answers or public solutions in order to correct the mistakes.

**References**

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