

# Use of the Cinema as a Strategy for the Teaching of Scientific Research

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## Summary

The present paper deals with the problems, goals, activities and achievements of the use of the cinema as a didactic strategy for research, which besides the incorporation of specific knowledge is required to obtain particular skills and attitudes. Since the students of the Faculty of Natural and Exact Sciences and Faculty of Health Sciences of the University of Belgrano were required to carry out a personal research as an end-of-degree project, the decision was taken to introduce -from the first years, apart from the subjects specific to the degree- any methodology that would motivate them beyond providing relevant data on the research world of in an attractive way.

Currently, the former possibility of the development of an almost personal relationship between a beginner in the field of research and his/her teacher is no longer a reality; this relationship allowed both profound insights into different aspects related to research that went further than merely methodological ones, issues such as secondary interests and benefits, the role of the researcher, the community role, respect for human beings, and the necessary ethical precautions, etc. Research needs to go beyond simple informative knowledge; it should also involve an education in skills and attitudes.

The use of films for the teaching of sciences is already an everyday reality in certain European countries, and we have even taken part in joint research on this topic between the University of Belgrano (Argentina) and the University of Salamanca (Spain). The novelty in this sense was to use it not as it is usually presented for a better recall of contents, but to motivate students to carry out their own research and to offer their initial conceptions on science and its methodology, together with their reflections about certain aspects of scientific work.

**Keywords:** Research, Research teaching, Science teaching, Cinema.

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## Introduction. An account of the experiment

This pedagogical experiment was based on the need to find a strategy to encourage the students of the Faculties of Exact and Natural Sciences and Health Studies of the University of Belgrano to begin their involvement in scientific research as soon as possible, so that once they had finished the subject-learning period it would not take them long to submit a blueprint for their

end-of-degree projects that they must do in order to graduate.

This latter requirement, the research project, has real drawbacks attached to it as far as its fulfilment is concerned, since several points that are difficult to solve merge. The students, who are overwhelmed at trying to pass their last subjects, leave this matter until the last minute, using the excuse that there is no rule that makes

it compulsory to even submit the topic of the project beforehand. In spite of the efforts made by teachers of the related subjects so that students will generate ideas and organize projects, the difficulties are not easy to overcome and students delay the submission of their projects until the latest possible date, even requesting extra time.

From this came the idea, within the compulsory extracurricular activities required for second and third year students until the gaining of a number of credits, of establishing a workshop that, in a leisurely and relaxed way, would motivate students and introduce them to the so-called research culture during the early stages of their degree. The goal was to stimulate them so that while they were studying the different subjects of their degrees they would already have in their minds the premise of finding an appealing topic and not postponing this decision until their last year.

For this purpose, within the availability of these open workshops and as a free elective option, the use of cinema was presented as an educational strategy for a first approach to scientific research. It is important to stress that students can choose to study these credits from among the wide range of workshops that are offered by all the faculties, which is very varied and interesting. Hence the need to present an offer that would be appealing, since if this were not so there would not be enough students willing to take it<sup>1</sup>.

Although the goal was not to provide methodological training on the topic in hand<sup>2</sup>, a list of reference texts was provided for the students to be able to establish discussions at a certain level about aspects related to research that might have caught their attention in the film and to proceed to an assessment of the content so that such work would lead to the gaining of credits. The basic premise in this case was the inclusion of types of behaviour and attitudes to motivate them and to give them greater security and confidence so that most of them would begin their research project in a timely fashion and with determination and hard work. Another relevant point was to create an environment in which it would be possible for them to become aware of their own ideas, to discuss them in the group, and to reinforce the principle that creativity is reached with an active attitude of close observation and intellectual search and not by patiently waiting for a brilliant idea to pop out of nowhere.

This workshop was organized by the directors of the degree with the help of the Dean and the Research Methodology instructor, who was experienced in the use of cinema as an educational strategy, since she had given courses and performed educational research into this

resource together with the University of Salamanca. This strategy has long been used on a regular basis Spain, even in courses that are part of PhD programmes, where the learning of many medical matters is structured on the basis of fictional films.

Fiction cinema, apart from being entertaining, can be very useful as a teaching resource through its images, sound, and the historical and social journeys evidenced in the scenes. It helps students to obtain global views about a topic and to store images in their mind that will later make it easier for them to remember the most relevant points, as well as providing them with the possibility of carrying out subsequent reappraisals of their meaning.

The challenge lies in turning the films into relevant questions and answers through the impact they have on the students; that is, to implement this resource so that students can live it as a stimulating experience that will encourage their desire to acquire new knowledge. The cinema allows scenes to be captured in a holistic way: the way the events take place in time, the impact on the population, or the influence of the phenomenon on present situations. But cinema also has its own language and it is necessary to bring students closer to the visual world, to teach them how to watch, how to decode an image. All tools that are currently as important as that of how understanding a written text. We should not carry out merely a linear reading of the events that take place in a film, since different stories are often interwoven, or one might trigger the next as if they were hypertexts. Because of this, yet another discourse format is necessary for the attribution of meaning, which requires articulation by the teacher.

### **Work methodology**

For a properly development of the working methodology and to obtain valid results, it is required an Educational planning work and the fulfilment of certain previous steps. One of the risks of the use of this resource is its trivialization; this often occurs in schools and students come with the memory of this experience, perhaps of having the absence of a teacher covered with the viewing of a film about which only a few superficial reflections were made, such as requesting a simple summary or a similar exercise.

Used in that way the whole strategy loses sense, it takes a lot of time of planning and organization and in view of so much effort it is fair to summarize as much as possible in order to make sense of their implementation.

The preliminary steps that should be taken are<sup>3</sup>:

**Establishment of goals.** As in all learning activities, the main issue is to clearly set the goals that are to be achieved through the workshop and to establish a way of assessing such achievements. The format of the class, the choice of the film and the ensuing discussions and/or assessments will depend on these goals. The same film can be used for very different purposes and the same goals can be achieved with very different films.

**Choice of the film.** The films must be related to the teaching goals but also to the characteristics of the student population. The most important criteria to be taken into account are the year in which the film was shot, the language, and the runtime. There are very interesting films about the lives of certain famous researchers that are more than 50 years old and not very suitable for young people, who could find them boring because the characters engage in attitudes that may seem too heroic and not very “natural” according to today’s tenets. When the original film is old and in a foreign language the translations might not be very clear, and in the case of subtitles being used these might be difficult to visualize properly on an ordinary screen.

The runtime is very important and will depend on the workshop’s schedule, but at the same time it will respond to the length of time young people might remain interested and attentive. It is worth recalling that students are being asked for an in-depth view of the events recounted, which will later be discussed during the debate stage, or which might have to be recalled for answering a previously prepared questionnaire. Therefore, they will have to pay closer attention than when viewing a film simply for leisure. This is why films used for these purposes should not last for more than an hour.

Another important point is the film’s format. The most suitable one depends on the audiovisual material available in the classroom to show the film, bearing in mind that certain older films can only be found in videotape format and that, in contrast, newer ones might only be available in DVD format.

**Use of films.** The plot of the film should preferably deal with the indicated topic in a central and not in a tangential way. However, if this is not easy to achieve, sequences from different films might be selected in order to obtain the most specific aspects of the topic or compare the different approaches. The films could also be interrelated with other artistic expressions such as painting or literature.

The following films are examples that would be very interesting for the above ends, each of them showing different aspects involved in research:

***And the Band Played On (1993)* by Roger Spottiswoode** (Figure 1). An American film on the topic of AIDS that clearly shows how the games of science are organized at the highest levels and how ideologies and political interest takes part in decision making<sup>4</sup>.



Figure 1: HIV isolation was performed at a large research centre [*And the band played on* (1993)].

***Casas de fuego /Houses of Fire (1995)* by Juan Bautista Stagnaro** (Figure 2). An Argentinian film that tells of the adventures of Dr Mazza<sup>5</sup> in his struggle to discover some of the epidemiological aspects of Chagas’ disease and its production and infestation cycle, in which we see field research work as well as aspects related to the lack of importance that was attributed to a matter that affected and continues to affect millions of the in America<sup>6</sup>.



Figure 2: *Houses of Fire/ Casas de Fuego* (1995), an example of research in the field.

***Lorenzo’s Oil (1992)* (Figure 3).** An American film that tells the long and difficult story, based on true facts, of a family with a son who suffers from a strange illness, adrenoleukodystrophía (ALD), and their struggle in the search for remedies and some hope for its cure. In this film we see how society is related to research and to the possibilities of support.



**Figure 3:** The consultation of bibliographic sources is essential in research [*Lorenzo's Oil* (1992)].

**Viewing methods.** Viewing can be full and collective, the film being shown with all the students gathered in the classroom, or individual. If the latter resource is used in on-line format, as is the case of the courses given by the Department of Public Health, Preventive Medicine and Medical Microbiology of the University of Salamanca, the students are provided with all the film material and they watch the films at home, later expressing their opinions in the virtual forum. For these first experiments, the traditional format of group viewing in the classroom was preferred, although other possibilities for the future have not been ruled out.

**Assessment of the learning period.** This is a very important point and it is also one that will allow us to gradually make adjustments to this experience. It can be done as a speaking or writing exercise, either individually or collectively by means of a group discussion. It is also important to carry out a survey to be able to measure the students' degree of satisfaction regarding this new teaching tool and their observations regarding the choice of the films and the characteristics of the course.

**Recommendations for teachers.** In order to develop this experience more smoothly, the teacher must collect a video or DVD library with a selection of films, each of them with its corresponding record of technical details and with the most relevant data such as runtime, production date, language, and a brief synopsis.

Another piece of relevant information is the date and place where the action develops, which may correspond to other geographical areas or other historical ages, such that it is necessary to acquaint the students with them, because without this information they might not understand the true dimension that the researcher in the film had to face up to, the rudimentary tools available or the political or social problems to be confronted. It is also useful to have data about the preliminary facts of its filming: possible censorship, what happened on the day of the première and the reaction of critics or the audience, the awards received, etc. Everyone tells us a different story of the same topic, as rich or even more so than the story told in the film.

## Conclusions

This resource has proved to be very useful in helping students to remember contents, but its use has been little assessed as regards the teaching of attitudes. It is now no longer possible to have a working relationship as close as those formerly established between instructors and students, when the number of these was reduced and they received their instruction from a teacher to whom they could express their reflections about different aspects related to research and the medical profession at the very moment the situation was taking place. Cinema allows us to force students to face these critical situations and sometimes even discuss them from a broader point of view, in an attempt to make them aware of the importance of research and of the contributions made to our improve quality of life and the development of humanity. The teaching of medical research needs to go beyond mere informative knowledge and must involve education in skills and attitudes.

The prominent role played by images is unquestionable, and nobody doubts the impact they have on viewers through a feeling of identification with the characters, in this case researchers through the emotion of the viewer becomes part of your struggle and feels in his own skin their motivation and push. These feelings lead to reflection and analysis of the situations that the protagonists live, encouraging students to develop positive attitudes and values and to acquire habits and conducts related to work and to dealing with problems characteristic of the development of a research project.

Film is a means that combines the spoken and the unspoken. Currently, 90% of the information we receive reaches our consciousness through the senses of sight and hearing, and nearly 80% does so using visual perception mechanisms. Thus, it there is no doubt that since childhood the vast majority of intellectual development takes place through images. And the paradox is that images have not yet been used at the percentages they should have been as an educational relevant tool in the classroom. It is unquestionable that people are now used to a narrative pace that does not match the one they find at school or in the university environment.

This resource allows us to focus on many goals at the same time, such as the efficient inclusion of new content based on its motivational and catalysing action, the possibility of analysing all the components involved in a study topic, since this displays the whole context in which the action develops. It also facilitates, by means of suitable discussion, the recognition of students' own views in order to identify what they focus on or extract from all these components; all of this added to the possibility of reflecting on the social and ethical values involved in scientific research.

Research is a human action, and as such it is performed within socio-historical environment that it is not far from its own prejudices and interests. The films show scientists and the vicissitudes they must face within society, thus acknowledging that many virtues are needed, apart from specific technical and methodological knowledge, in order to carry out research work successfully. These virtues are creativity, persistence, the ability to deal with problems, self-confidence, etc. to which, owing to the complexity of current research, we should add the ability of working in a team and being willing to request and share experiences, without which it would be well nigh impossible to develop important projects.

The second important challenge would be the use of cinema together with other artistic expressions such as the paintings of great artists who have portrayed the figure of the researcher over the years, expressing in one way or another the underlying ideas that society had, ranging from the old alchemist to the modern researcher. Through different artistic resources we must attempt to encourage students to understand that there is often a stereotyped idea regarding science and scientists that is reflected in films and also in works of art. Scientists are often portrayed as “special”, different from others, when in fact research is a human activity just like any other, with its injustices and mistakes.

Importantly, although based on historical situations biopics -short for “biographical pictures”- are not always completely true to life, which is the case of documentaries, and it is often very useful to discuss some of the facts that are not strictly true but that were used by the director to add passion to the story. It may also be the case that neither the success nor the recognition shown by peers in the times when the film was shot were as important as those reflected in it, since the importance of certain scientific breakthroughs was often only to become known later. Many researchers, like many

artists, receive society’s recognition late or even posthumously, such that this should not be the incentive to motivate students; instead, we should be looking at the personal recognition that they will obtain from having dared to question doubts and the pleasure they will receive from having entered the adventure of knowledge acquisition.

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