

CINEMA AND SCIENCE (CISCI) - A NEW INNOVATIVE ON-LINE EDUCATIONAL ENVIRONMENT

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Introduction

Cinema and Science (CISCI) is an educational project promoting science in schools. It is part of the NUCLEUS-cluster funded under the *European Science Teaching Initiative* of the European Commission's Sixth Framework *Science and Society* programme. NUCLEUS is a cluster of EU-projects comprising the following projects: CISCI, ESTI, PENCIL, SCIENCEDUC and VOLVOX.² The CISCI-project is a partnership between universities, research organisations and SMEs having an extensive and complementary expertise in education, outreach, marketing and ICT. The CISCI-consortium consists of institutions in 8 different European countries and the U.S.A under the co-ordination of the Vienna University of Technology. The official launch of the website <http://www.cisci.net> with contents in 6 different European languages is planned at the end of 2006.

Objectives of CISCI

In a few years, especially in Europe, we will have an alarming shortage of scientists in basic research and innovation. Although, science is very popular today - as long as we talk about movies, TV-programmes and popular books. But when it comes to choosing what to study, only few prospective students choose to study science or take up a science career. So, science is a subject which is declining and at best stagnating in the popularity among the young generation. It is obvious that there is a strong interest in our society to act against this trend. The project Cinema and Science (CISCI) supported by the European Commission is an innovative educational project going to do just that.

CISCI will combine the two most popular media among youngsters, namely movies and the Internet, aiming to stimulate interest in science while dispelling widely-spread misconceptions that arise from pseudo-science. CISCI is setting up a free database with video clips and movie scenes taken from documentaries and popular movies that serve to illustrate scientific concepts and analysing their scientific content from the point of view of different subjects taught at school, like for example physics, chemistry, life sciences and mathematics. On a web-based platform CISCI will provide this new innovative classroom resource for school teachers and their pupils.

The main purpose of CISCI is to enhance the attractiveness of science teaching in schools across Europe complementing formal curricula. The primary target groups are European school teachers and their pupils. As a secondary target also the general public is addressed. CISCI will use an innovative approach with the following strategic objectives:

- To raise the interest and attractiveness of science in the young generation and support the study and career choices of young people in the direction of science through movies
- To take movies as a vehicle to present scientific concepts and laws to pupils

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² NUCLEUS: http://www.xplora.org/ww/en/pub/xplora/nucleus_home.htm



- To provide teaching staff with a broad range of downloadable support materials to facilitate the preparation of lesson plans / curriculum support and allow teaching professionals to collaborate productively via the Internet and to share experience as well as comment / judge the usefulness of the film resources
- To help pupils to learn to distinguish between pseudo-science sciences presented in popular movies and scientific laws and ideas, to think critically about science information presented in popular movies, and help them to learn where the borderline between verified and untested scientific assertions
- To overcome gender-stereotyped representations of science and scientists and encourage especially female students to engage with scientific careers
- To engage with professional bodies who have a vested interest in the promotion of scientific study to fulfil vacancies in industries, e.g., engineering, pharmaceutical, etc., and provide science careers based advice to students

It is well-documented that most people have very little understanding of science and are in fact often unable to distinguish between science and pseudoscience. The entertainment industry and especially the film industry is partially the reason and a significant source of the public's misunderstanding about scientific achievements and facts, because of their faulty presentation of science. Many blockbusters include often elements that are related to or science fiction or pseudo-scientific fantasies. Just because of these elements films and especially blockbusters are very popular in the public and especially the young generation. The relevance of this behaviour with respect to the attitudes of science is a double-edged sword. On the positive side it can raise the interest and attractiveness of science, on the negative side it may lead to serious misunderstandings and faulty knowledge of science.

CISCI will not only concentrate on movies that are scientifically sound, but will rather present and discuss also movies that perpetuate the incorrect understanding of science in a critical manner. CISCI does not want to high-light bad-movie science in films, since it is clear that science shown in films is often a mixture between reality and fantasy. Rather the borders between science and fiction will be discussed to give an answer to what extend science shown in a specific movie scene corresponds to reality and what is fantasy. In other words we want to answer the question that is often raised and discussed by visitors after watching a movie: "Can this really be true?" or "What is science and what is fiction?".

CISCI-Survey

In order to find out the wishes of our target group, namely school teachers and their pupils, we carried out a teachers' survey in all countries of the CICI-partners. The main results of this survey can be summarised as follows:

- The acceptance of such a teaching/learning aid as CISCI is very high and the concept meets exactly the demands of science teachers
- There are no technical restrictions for the web based service because the technical equipment of the schools is sufficient
- Nearly 50% of the target group already have experience with such teaching aid and are very open to use the CISCI-services
- Since there are already some experiences (50%) on one hand and on the other hand there are teachers or schools which by now do not take advantage of such an aid (50%) there are a lot of opportunities for CISCI

- It is interesting that teachers would also prefer to use documentaries and are not only focussed on popular movies

Content unit

The core element of CISCI is the content unit. The CISCI-platform will comprise at least 160 content units taken from scientific subjects like physics, life sciences, chemistry and mathematics. Furthermore, more specific subjects like history of science and gender aspects will be addressed by specific content units. The content unit is based on a scene shown on a video clip or a movie scene with a length of up to 3 minutes. The information found on a content unit is as follows:

General information about documentary, popular movie or video clip collection:


- Discussed scientific subject and topic: The subjects are classified according to the different subjects relevant for the school curricula like physics. The topic is then a subdivision of a subject, like the topic gravitation belonging to physics
- Information about the video clip collection, documentary or popular movie: In these fields the title, year, producer and director of the video clip collection, documentary or popular movie can be found
- Description and website: These two fields describe the contents of the documentary, popular movie or video clip collection together with a link to the corresponding website, when available
- Link to trailer site and corresponding DVD: A link to the trailer site and/or the corresponding DVD of the video clip collection, documentary or popular movie is established whenever available

Information and explanation of the considered video clip or movie scene and the related science (see for instance Fig. 1):

- Video clip or scene on a DVD: When CISCI has obtained a licence for providing the video clip on the CISCI-website it can be downloaded from the CISCI-website. Another alternative is to present the time interval of the considered scene on the corresponding DVD
- Author and editor of content unit: The author(s) and editor of the corresponding content unit with their E-mail addresses
- Title and description of scene: A suggestive title as well as a short description of the scene is included
- Scientific keywords: At most three scientific keywords related the science discussed in the content unit is presented
- Basic (10+) explanation: This field contains the science-related information of the clip and is targeted at pupils older than 10 years. It will help the teacher in preparing an interesting and exciting lesson for 10-14 year old pupils
- Advanced (14+) explanation: This field contains the science-related explanation of the clip and is targeted at pupils older than 14 years. It will help the teacher in preparing an interesting and exciting lesson for 14-19 year old pupils

- Background information for teachers: This field gives scientific and didactical background information related to the considered scenes for the teachers

EXPLANATION						
Basic	Advanced	Scientific	Movie	Movie Clip	Director	Film Studio



Author: Heinz Oberhammer
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Movie: Deep Impact
Movie Clip: From 01:39:05 to 01:41:55 in Chapter 27
Director: Mimi Leder
Film Studio: DreamWorks SKG, Paramount Pictures, Zanuck/Brown Productions

Basic level

Comets are objects consisting of ice and dust and are therefore often called "dirty-snowballs". They come from far out in the solar system. Asteroids, on the other hand, are rocks coming from a region between the planets Mars and Jupiter. Sometimes it can happen that a comet or asteroid hits the Earth. When it slams into an ocean a series of gigantic waves are produced, which are called tsunamis.

In the scene the comet becomes fiery on its way through the atmosphere and a gigantic tsunami is produced as the comet hits the ocean. This tsunami then devastates New York and other coastal areas. In the scene the wave is a few 100 meters high. That is realistic for a comet with a size of a few kilometres.

The comet Hale-Popp that was visible in the year 1997 was probably the most viewed comet in all of human history [Source: U.S. Naval Observatory]




Fig.1 Part of a content unit of CISCI

One of the difficulties in CISCI is obtaining the intellectual property rights for providing movie clips on-line. CISCI has obtained the rights for many documentaries and films. However, it is a "mission impossible" to obtain the rights for movie scenes of popular films and especially blockbusters. However, we found a way to circumvent this problem. In the content units a link is given to a trailer site as well as the time interval of the considered scene on the respective DVD. The DVD can then be obtained by the teachers either by renting or purchasing it and the corresponding scene can then be shown by the teachers in the classroom.

CISCI in the classroom

CISCI is a combination of two involving, exciting and high-impact media, namely movies and Internet. Moving pictures of any kind are cool, involving, and inspiring for the young generation. Movies create trends, and have a broader impact on young people than any other media. CISCI addresses pupils with the help of teachers as science mediators and provides them with video and movie scenes related to (pseudo-)science as „anchor“ for their lesson in the classroom. These anchors as part of a school lesson can enhance the interest in scientific subjects significantly among pupils.



Cinema and Science

This combination of presenting a video or movie scene in the classroom with a discussion of the (pseudo-)science can be much more interesting for pupils than just a traditional lesson. Also it is more rewarding from the didactical point to show just in the classroom a scene as an “anchor” than presenting the whole movie to the pupils. Our experience has shown that moving pictures can create significantly more interest and excitement among pupils than just traditional teaching.

Many educational on-line offers for schools hardly reach the classroom, because the demanded skills are too complicated and tedious for teachers for using them. Sometimes in schools the technical infrastructure is not sufficient enough in the classroom itself to use e-learning offers. For CISCI it is neither essential to have a computer class nor to have an Internet connection in the classroom. The only thing that one needs in the classroom is a PC or laptop with a connected video projector, which is available in most schools. A teacher using CISCI can select in the lesson preparation a video clip or movie scene from a DVD to be shown in the classroom. The teacher has then the benefit that he can prepare and present a really interesting and exciting lesson by using the ready science-related information given in the respective content unit on the CISCI-site.

A great variability of at least 160 content units related to video or movie scenes up to a length of 3 minutes from documentaries, blockbusters and video clip collections will be available on the CISCI-website. Each content unit describes and discusses the (pseudo)-scientific content of the related video or movie scene. These accompanying explanations and background information of each content unit will help the teacher in preparing a truly interesting lesson.

Dissemination

In order to attract visitors to a start-up educational website it is by far not enough to launch the website. Rather it is necessary employ an extensive dissemination strategy including a whole variety of different dissemination activities and events to attract the target groups to the website. CISCI is promoted and disseminated through educational portals and websites, presentations at national and European workshops and conferences, promotion material as well as events related to “Cinema and Science”. Specific dissemination activities with respect to CISCI are:

- A DVD with a project tour about CISCI including pilot content units has been produced by the CISCI-consortium.³
- Numerous events related to CISCI as spin-offs and complementary activities are taking place promoting the CISCI-project. For instance, events like “Science in Film” in Austria,⁴ “Vedere la Scienza” in Italy⁵ and “Physics & Film Series” in U.S.A.⁶ attract hundreds to thousands of visitors.
- A TV-spot bout is in production that will be shown on different European TV-stations. This video will provide information about the CISCI-project in an attractive and illuminating way. On a concrete example the TV-spots shows how movies can awake the natural curiosity among pupils and how the CISCI-project can take advantage of this.
- Science on Stage International Festivals⁷: The Science on Stage programme offers European science teachers the chance to exchange successful and innovative teaching methods and materials. CISCI has run a workshop at the International Science Teaching

³ Cinema and Science - The complete project tour on DVD: Vienna University of Technology, 2006

⁴ Science in Film: <http://www.scienceinfilm.net>

⁵ Vedere la Scienza: <http://www.brera.unimi.it/film/>

⁶ Physics and Film Series: <http://www.jinaweb.org/outreach/filmseries/filmseries.html>

⁷ Science on Stage - A Programme for European Science Teachers:
<http://www.scienceonstage.net/main/intropage.asp>



Festivals "Science on Stage 2005" at CERN, Geneva, Switzerland showcasing the best of today's science education.

- Science in School:⁸ Science in School is a quarterly journal for teachers, scientists and all stakeholders in European science teaching. In its very first issue Science in School in March 2006 CISCI will be featured.
- Educational Portal xplora - European gateway to science education:⁹ This portal is aimed at teachers, pupils, scientists, science communicators and science educators.

The last three activities take place through collaborations within the NUCLEUS-cluster funded under the *European Science Teaching Initiative* of the European Commission's Sixth Framework *Science and Society* programme

Summary

Science in films (CISCI) has a unique selling position in the educational sector, because it combines the most popular media of the young generation, namely moving pictures and the Internet. The project Cinema and Science (CISCI) makes science teaching more interesting by providing teachers with simple-to-use, just-in-time, well-prepared lessons with movie scenes and video clips as „anchor“ for the classroom.

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⁸ Science in School - Journal for teachers, scientists and all stakeholders in European science teaching:
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⁹ xplora - European Science Education Gateway: <http://www.xplora.org>