



CEDEFOP

European Centre for the Development
of Vocational Training



Education and Culture DG

Lifelong Learning Programme

Study visit group report



Group No 171

Title of the visit Scientific and humanistic culture in astronomy

Topic Learning Mathematics and Science

City, country Lyon/ France

Type of visit Mixed

Dates of visit 23/05/2011 - 27/05/2011

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I FINDINGS

1. One of the objectives of the study visits programme is to exchange examples of good practice among hosts and participants. Cedefop will select well-described projects/programmes/initiatives and disseminate them to former participants and a wider public, including potential partners for future projects. Therefore it is important that you identify and describe all aspects that, in your view, make these projects/programmes/initiatives successful and worth exploring.

Describe each of the good practices you learnt about during the visit (both from the hosts and from one another) indicating the following:

title of the project/programme /initiative	country	name of the institution that implements it (if possible, provide a website)	contact person (if possible) who presented the programme to the group	whom the project/ programme/ initiative addresses	what features of the project/programme/initiative make it an example of good practice
“Teaching Astronomy and Philosophy together”	France	Lycee Polyvalent Chaplin Becquerel http://artsandstars.ens-lyon.fr/	Philippe Jean Jacquot Pierre Vignant	students/ teachers	<ul style="list-style-type: none"> - using Stellarium software to attract the students - students are aware of Philosophy through learning Science - giving students the scientific background through the history of Science - tips for teaching Astronomy and humanism culture in more attractive way for both students and teachers
“Teaching Astronomy in English”	France	http://artsandstars.ens-lyon.fr/	Christian Marchal/ Fabien Jeannier	students/ teachers	<ul style="list-style-type: none"> - MPS (Maths/ Physics/ Biology) equally balanced - theme-based education - using online authentic documents - using English to learn Astronomy - visiting different cities in the UK (science-related museums and observatories) - sequence or presentations of famous scientists or science labs - developing students’ ability to work on project-based approach - enhancing students skills in understanding and manipulating orders of magnitudes when dealing

					<ul style="list-style-type: none"> - with natural phenomena - working with ICT tools - great examples of combining Science with English teaching/ learning
“The Astrolabe”	France	Institut National de Recherche Pédagogique http://artsandstars.ens-lyon.fr/	Charles-Henri Eyraud	students/ teachers	<ul style="list-style-type: none"> - learning by doing - relation with the History - obtaining a lot of information which can be used to many activities related with astronomy and Geography
“The Eratosthenes project “	France	Institut National de Recherche Pédagogique http://artsandstars.ens-lyon.fr/	Charles-Henri Eyraud	students/ teachers	<ul style="list-style-type: none"> - communication between pupils in different countries/ extending the educational context - the cooperative methodology and the approach to the ancient methodology - constructing the idea of sphericity - the opportunity of concluding the measurement and bringing to the point - supporting mobility, quality of education and intercultural dialogue in Europe
“Literature and Astronomy”	France	Institut National de Recherche Pédagogique http://artsandstars.ens-lyon.fr/	Marrie Musset	students/ teachers	<ul style="list-style-type: none"> - teaching Astronomy through Literature - using authentic sources - strengthening the idea that fiction, social, imagination are worth working in the Science courses - literature as “thought experiment”
“Researching the golden proportions in the Castel del Monte”	Italy	Liceo Scientifico Enrico Fermi Canosa di Puglia within the European Social Fund 2007-2013	Severio Rana	students/ teachers	<ul style="list-style-type: none"> - using the objects to recognize the proportions and geometrical forms - learning by doing - connecting geographical data with architecture

					<ul style="list-style-type: none"> - combining esthetics of Mathematics and relating to Astronomy
“Geogebra programme”	France	Lycee de l’automobile (Emilie Bejuitt) http://artsandstars.ens-lyon.fr/	Lauren Costa Michel Cauchois	students/ teachers	<ul style="list-style-type: none"> - open source software available in different languages/ easy to use by teachers and students - interesting tool to make the lessons more attractive
“The Sun, the king : from Galileo to Halley”	France	Institut Supérieur Electronique Numérique www.isen.fr	Pierre Le Fur	students/ teachers	<ul style="list-style-type: none"> - it links history of Science with pupils’ activities - we can use it in different group of ages - using very cheap and easy to achieve materials

2. The study visits programme aims to promote and support policy development and cooperation in lifelong learning. That is why it is important to know what you learnt about such policies and their implementation during your visit. You are invited to describe your findings concerning the following:

2.1 APPROACHES TAKEN BY PARTICIPATING COUNTRIES (BOTH HOST AND PARTICIPANTS') REGARDING THE THEME OF THE VISIT. ARE THERE ANY SIMILAR APPROACHES/MEASURES IN PARTICIPATING COUNTRIES? WHAT ASPECTS ARE SIMILAR AND WHY? WHAT ASPECTS ARE DIFFERENT AND WHY?

SIMILAR APPROACHES:

1. “Hands-on learning”/ learning by doing

All the teachers participating in the study visit try to “do” Science.

They use different methods based on the “hands-on learning”.

We all agree that hands-on learning is the easiest way students can directly observe and understand Science as they can develop effective techniques for observing and testing everything around them. Hands-on learning requires from students to become active participants instead of passive learners who just listen to the lectures. Laboratory and field activities are traditional methods of giving students hands-on experiences. Such great examples were given during the study visit. For example Italian school use the real object that is the Castel Del Monte to research the golden proportions. All the schools make the observations with their students and what’s more they involve their parents/ grandparents in these activities that way they improve the cooperation between families and schools.

2. Using ICT

ICT and all the electronic devices are being included in teaching and learning astronomy to make the lessons more attractive by simulations and models in order to motivate students to learn Science subjects, prevent their school drop-out and teachers’ burnt-out.

3. Motivating students

All the schools face the same problem - lack of motivation of the students to learn Science subjects. We all use different teaching methods to attract students to our lessons (presentations/ different software/ working in groups and pairs/ projects/ videos/ authentic resources/ visits to observatories/ Science labs). What works in all the school is the presence of enthusiastic and passionate teachers who are willing to share their knowledge with younger generation.

4. Context based learning

All the countries try to offer more projects connecting different subjects in order to give sense to Mathematics and Science (to prove that Science is present in our lives/ make Science part of real life). Parts of these efforts is get to know children' conception and take them into account when designing learning activities and if they are wrong try to change them.

5. the lack of qualified teachers to teach astronomy

6. participating in European projects

DIFFERENCES :

We didn't notice any specific differences. Only one but very important thing that is different in all schools is the amount of Astronomy in the school curriculum. In some countries Astronomy is an autonomous discipline in secondary education schools but it is optional (Spain, Greece, Finland, Romania, Turkey, Cyprus) but at different age levels. And only minority of students attend such courses. Astronomy is a part of different courses/ lessons in different schools (Physics/ Geography/ History etc.)

2.2 CHALLENGES FACED BY PARTICIPATING COUNTRIES (INCLUDING HOST) IN THEIR EFFORTS TO IMPLEMENT POLICIES RELATED TO THE THEME OF THE VISIT. WHAT ARE THE CHALLENGES? ARE THEY COMMON CHALLENGES? IF SO, WHY? IF NOT, WHY NOT?

1. Breaking the segmental knowledge nowadays in schools in order to put subjects as an approach to the real world.
2. Using more historical background to connect the Science subjects together.
3. Motivating students to learn and toward Science and Astronomy in order to avoid their dropping-out.
4. Motivating teachers to develop themselves in order to attract their students and make their lessons more interesting.
5. Improving the basic skills of students (make them competent).

2.3 NAME AND DESCRIBE EFFECTIVE AND INNOVATIVE SOLUTIONS YOU HAVE IDENTIFIED THAT PARTICIPATING COUNTRIES (BOTH HOST AND PARTICIPANTS) APPLY TO ADDRESS THE CHALLENGES MENTIONED IN QUESTION 2.2. PLEASE MENTION SPECIFIC COUNTRY EXAMPLES.

“The Eratosthenes project “made by French school is a great example of a collaborating project to improve motivation for Science and Astronomy and also the basic skills as they have to write/ speak/ use different electronic devices, ICT, improving communication in foreign languages.

Another example is connected with “hands-on projects”. Italian example is The Castel del Monte. Strengthening the skills and competences with respect to new learning methodologies / using new technologies/ development of educational settings.

During this study visit we have also been acquainted with different open software programmes as Stellarium and Geogebra. They have been presented to us by French teachers in order to attract our students to learn Astronomy and other Scientific subjects. GeoGebra is free and multi-platform mathematics software for all levels of education that joins Geometry, Algebra, tables, graphing, statistics in one easy-to-use package. It is available in many languages and we can do constructions with points, vectors, lines as well as functions and change them dynamically afterwards. Thus it is a great tool to use during different lessons such as Mathematics, Physics and Astronomy. It gives the students the opportunity to experiment with different kind of astronomical problems and explore them by themselves and focus their attention to the problem itself. Also it is very useful tool for the teachers instead of using the good “old pen and paper method” so boring for our students. And finally Stellarium - a free open source planetarium for our computers that shows a realistic sky in 3D, just like what we can see with the naked eye, binoculars or a telescope. Using such a small planetarium for our computers could be a great fun both for us as for our “bored” with traditional learning students.

2.4 ASSESSMENT OF THE TRANSFERABILITY OF POLICIES AND PRACTICES. COULD ANY EXAMPLES OF GOOD PRACTICE PRESENTED IN THIS REPORT BE APPLIED AND TRANSFERRED TO OTHER COUNTRIES? IF SO, WHY? IF NOT, WHY NOT?

Most of them. For instance: the Eratosthenes project can host more schools from the participating countries.

The project connected with Stellarium can be transferred to other countries as it connects History with Astronomy. It easy to use and obtain/ u can get a lot of information and connect with historical events (past/ present and future). It can be used during Geography/ History/ Physics lessons.

After this visit we are able to collaborate all the countries in order to create a common project focused on Astronomy to be developed in our schools, for example taking photos of 15th June Moon Eclipse and 6th June 2012 Venus Transit.

3. Creating networks of experts, building partnerships for future projects is another important objective of the study visit programme.

Please state whether and which ideas for future cooperation have evolved during meetings and discussions.

- creating the common European project focused on Astronomy. For example e: twinning project or Comenius project
- developing networks that include information about interesting projects made by participating students connected with Astronomy
- exchanging information about good practices
- organizing the conferences connected with dissemination of the results of the study visit/ training for young teachers showing them the good practices

TO SUM UP

4. What is the most interesting/useful information that the group believes should be communicated to others? To whom, do you think, this information will be of most interest?

We all have similar wish to be able to teach our students in a more creative way in each of our countries. There is a lot of to learn from each other as well as inspire each other for more effective and creative learning. In modern school there is a must to teach young people in modern and up-to-date way using different tools (programmes/ ICT/ electronical devices) instead of boring “pen and paper method” as in only such a way we will be able to motivate the students to learn more Science subjects and create the new generation of young, intelligent Europeans. We have the chance to obtain the knowledge during such visits and other European programmes and funds.

Whom:

- mostly teachers involved in teaching Science subjects
- other teachers which subjects can be related to Astronomy such as Philosophy/ History teachers/ foreign language teachers
- Head teachers/ Deputy Head teachers
- finally teacher trainers

THANK YOU!