



Virtual Meeting

Presentation of the Comments on Educational Products

Meeting held 15 October 2015, 15:00 – 17:00 CET

The video of the meeting is available on this Internet address:

<http://flashmeeting.e2bn.net/fm/b5b107-18237>

Participants

Partners

Grzegorz Grodek (36,6 Competence Centre), Anna Ziemecka-Poteraj (36,6 Competence Centre), Ignacio Pachés (Alqueria), Andreea Ionel (EuroEd), Elza Gheorghiu (EuroEd), Dragos Zamosteanu (EuroEd), Lorenzo Martellini (Pixel), Giovanni Caruso (Pixel), Romans Vitkovskis (Riga State Technical School), Juraj Dubrava (TRANSFER Slovensko), Vlasta Dubravova (TRANSFER Slovensko), Miglena Molhova (ZinevArt), Zornitsa Staneva (ZinevArt)

Teachers and Experts

Milena Gosheva (Bulgaria), Nevenka Kostova (Bulgaria), Alberto Dominguez (Spain), Laura Capella (Italy), Massimo Amato (Italy), Uldis Heidingers (Latvia), Anita Krišamane (Latvia), Maria Deptuła-Chocholska (Poland), Jean Rotaru (Romania), Anais Colibaba (Germany), Jozef Strakoš (Slovakia), Katarína Javorová (Slovakia)

Minutes

As an introduction Lorenzo Martellini presented the agenda of the meeting.

Presentation of the transnational discussion on the project portal related to the educational products (RSTS)

Romans Vitkovskis welcomed all the participants to the virtual meeting and left the floor to Uldis Heidingers for giving the overview of the activities both on the Latvian and international level.

All partners have checked educational materials and have submitted comments on them.

Educational material – model method was mainly used because it was chosen as one of the renowned one by partners and a number of teachers commented that other methods must have more long time to test them.

All comments was positive and open some surprising details of use models creation and use in education process.

The summary of teachers' opinion is as follows:

- Several good models motivate creation of the next models and create some game play.
- Process with models creation is innovative, intriguing, captivating and good excersise for mind and have a lot of fun.
- Models are original way how to remember long time.
- Teachers more pfeafar the models creating process to final result – good models.
- Models creation process shows students attention to subject, level of their understanding and creativity.





- Teachers have intention to continue models method use.
- Models method and models cannot be as a part of theoretical text of taught subject but can be used as relevant help to comprehend/understand and remember it for long time.

Students opinion is as follows:

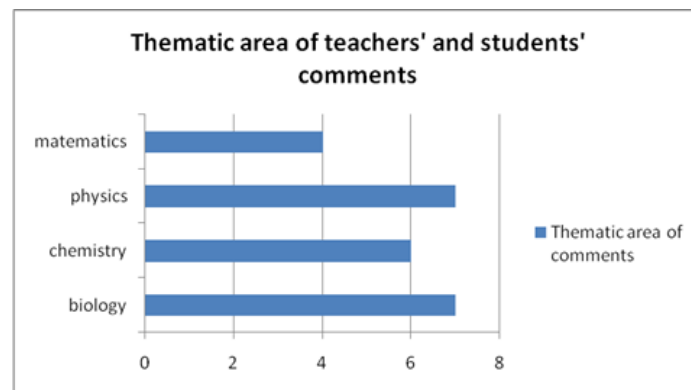
- Creating and protecting model student feels himself as the center of the process and likes this position following have motivation to participate.
- It is the original way how to see how different things works and how to remember complicated definitins, concepts and rules.

As a new method models method was also met with skepticism and only after several attempts looking on results appears enthusiasm. Models method can be accustom in short time and is attractive for students. It is a reason why teachers are intended to use models in their practice further. Teachers pointed out that this process of familiarization was created closer ties between teachers of partner countries. As it was mentioned before other methods was started to check them, but they are more complicated and takes more time as it was given.

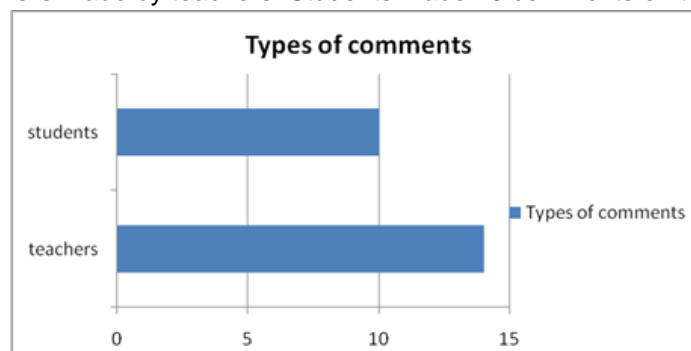
Feedback of the Bulgarian teachers (ZinevArt)

Miglana Gosheva reviewed the work of the Bulgarian teachers and students on the educational products drawing the main features of their contributions.

Bulgarian students and teachers have made 24 comments in total – 7 in biology, 6 in chemistry, 7 in physics and 4 in mathematics.



Most of comments (14) were made by teachers. Students made 10 comments on the educational products.

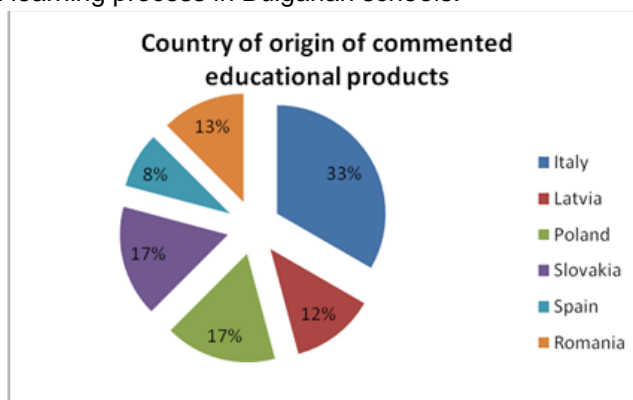


In terms of types of educational products commented, Bulgarian teachers and students chose to comment more educational models than lesson plans. 19 educational models were commented and 5 lesson plans.



One reason for this could be that educational models are a new practice for Bulgarian teachers and students and they chose to comment on them as possibilities for future application in the educational process.

In terms of country of origin of the educational products commented, the greatest interest was shown in educational products from Italy (8 comments). Considering the similarity in educational systems of both countries teachers and students probably were more interested in educational products that could be easily applied in the teaching and learning process in Bulgarian schools.



All comments of Bulgarian teachers are positive and most teachers said they would be happy to use the educational products in their practice. There was only one comment that was referring to the possibility of using another way of representing the theoretical concept, since the chosen one was not considered correct (acid-based reaction, educational model in chemistry and biology). However the communication between the teachers showed that this model was created by a student and his fellow students loved it, so the teacher decided to accept it. Comments in this way can be considered very useful since they allow teachers to exchange experiences and improve the way they teach.

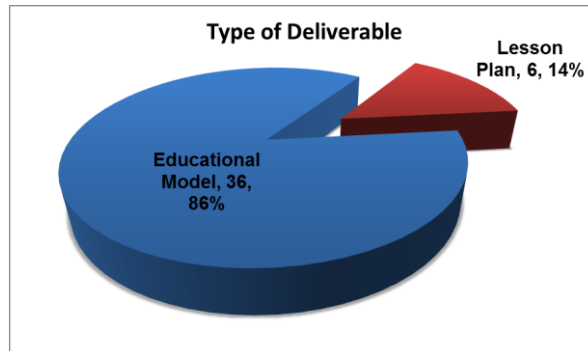
In terms of students comments they were also very positive, encouraging their teachers to use more educational tools of this kind in order to make the teaching and learning more interesting and students more motivated to learn.

Feedback of the Italian teachers (Pixel)

Giovanni Caruso started presenting the results from the last activity carried out by Italian teachers, that is the production and the commenting of educational resources.

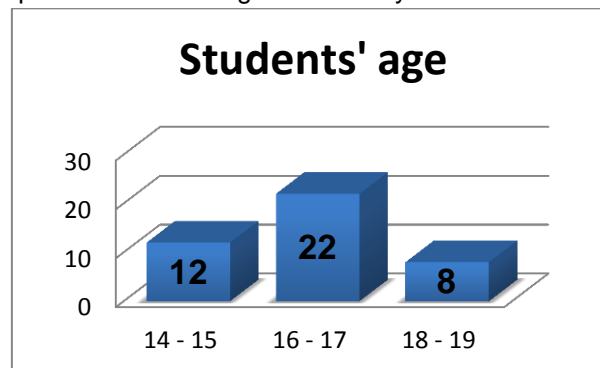
Thanks to the experience gained through the reviewing of the initiatives found on the web, teachers were required to choose one or more methodologies, to modify and adapt them to their personal context in order to create their own educational products.

Two workshops have been organized with the aim to guide the teachers through the initiatives. During the first one of these two workshops, held on Pixel site the 18 February 2015, the 11 participants highlighted two main types of educational product: the lesson plan and the educational model. The participants received training on both these two methods. Teachers' task within the second workshop was to create their own educational products. This second meeting was held always in Pixel site on 30 March 2015 and was attended by 11 teachers. Each participant presented his/her work and also the results of the cooperation with the students.



Nevertheless the initial skepticism about methodological aspects, teachers accepted the challenge of the Goerudio method and proposed to their students to practice with it. Students' reaction was almost everywhere enthusiastic and very productive. They felt to be at the centre of the learning process and, above all, they were participating to the production of the learning resources. As the graph clearly shows, this kind of educational product has been the most preferred and more than 85% of the 42 educational products uploaded from Italy were Goerudio Models. Sometimes they do not respect all the criteria required by the "Goerudio Method", but teachers focused their attention and their appreciation on the process more than on the final result. Each one of these models gave the opportunity to start a discussion in class and this was the most appreciated aspect by the teachers.

With regard to the other kind of educational products, 6 teachers produced also cross disciplinary programmes. These are very challenging learning paths, requiring many hours for their implementation. Some teachers managed to test these lesson plans during the past academic year, others took the opportunity to schedule its implementation during the current year.



Italian contribution gave to this database 42 educational products covering all the range of age of the project's target group. The most part of them (50%) is for students between 16 and 17 years old, but the users interested in educational products for other students' range of age will find materials as shown by the graph above.

After this quantitative analysis, Laura Capella took the floor sharing her experience. Nowadays many teachers knows that is necessary a different type of methodology, comparing to the past, to reach students and grasp their attention to vehyculate disciplinary contents. Traditional frontal lessons doesn't match anymore, even if in the past, the needs of today students. Many efforts and a lot of different metodologies have been developed to aid teacher teaching well and students learning well the same contents or whatever else.

When I firstly joined the project I did it because I believe in the strength of sharing opinions among colleagues, and indeed the project is useful even for this (it reaches many more colleagues than those nextdoor), but I didn't know what was going on.





I will not go deep in explaining that I was diffident if not suspicious in the Goerudio idea of models and why, at the very first time Pixel shared this methodology with us.

Then I changed my mind.

Let say: an image has the capability to transmit in few seconds, and in a deeper way, a concept, an idea. Advertisement and marketing stuff know this very well since a lot of time. (Even, I usually have tried to explain things evocating images to the mind of my pupils, but the problem is that they have to pay attention to my words!)

So, why not use an image for a scientific concept that often is difficult to explain in words.

An image for a scientific concept, but which image? An image chosen by the teacher, yes but...probably would be better an image chosen by a student! There would be some advantages.

- 1) it reaches more the students because come from peers
- 2) it reaches more the students because is taken from their daily life
- 3) it make them more involved and more aware of the subject.

I'd already used unconventional methodologies in my class work to make easier the teaching/ learning process, but nevertheless this new approach I think it helps a lot, with most of the students and sometimes more when there are learning difficulties. I don' have too many cases to say that for sure but it's a hint and I want to explore somemore this field.

I First tried with: organic chemistry (my favouriire subject) age 17-18. The work was good, you can see some of the pictures on the portal. Some of them were original and surprising.

The second experiment(I'm carring on it at the moment) is on general chemistry subjects like chemical bonds.

Very interesting are several things but expecially two that I am exploring in this moment: the discussion with class that can be done after the drawing and the emotional involving of the class during the activity.

Massimo Amato hired also for an intervention focused on the main models produced by his students. More than 55 physic products were created by my students, but only 5 experiences I would like to introduce quickly.

Newton's dynamic laws

An image of two judo students. This idea represents all the three Newton's laws. The principle of inertia (with the projection of the opponent boy that can't continue indefinitely in uniform motion because the gravity), the force of the athlete who throw the second boy in air, the action-reaction law (the equal and opposite force of the second boy on the first one).



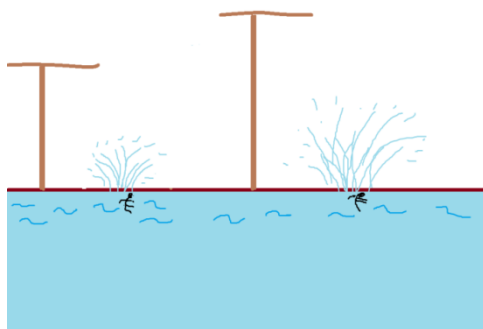
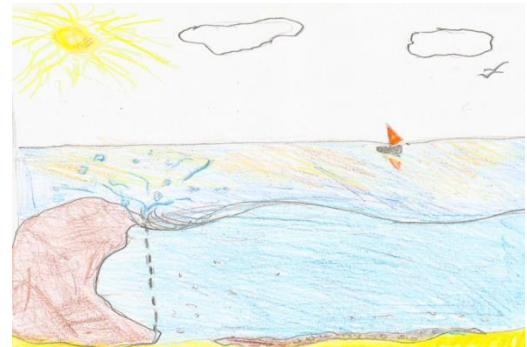
Center of Gravity

The tightrope walker crossing a rope: its body is balancing and he is keeping his center of gravity perpendicular to the rope trying not to fall; the center of gravity must stay in about 2 centimeters, the width size of the rope.



The conservation of energy

In the sea, there is a rock which is eroded by sea currents and all the little pieces of the rock doesn't disappear, but they turn into debris deposited on the seabed. At the same the energy can change continuously but don't disappear.

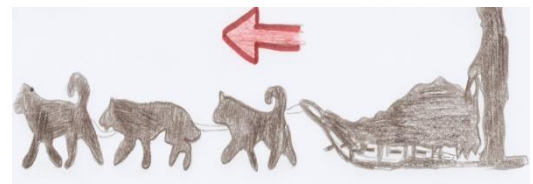


The moment of a force

Two guys of equal mass jump into a pool from two diving boards of different heights; the boy who jumps off the trampoline higher, makes sketches higher than the second, because the distances from the point of jump to water are different. In the same way, the moment of a force is higher when the distance from the force to the rotational point increases.

Vector

Some dogs are pulling a sled in one direction; there are the three entity that characterize a vector: the trajectory (the line followed by the dogs), the direction (the tip of the arrow used to indicate where dogs are moving) at last the modulus (represented by the number of the dogs).



The educational products are been made in two kinds of school: social and economic high school and scientific high school. Student's models are very different even if the physic arguments taught in the class were the same.

Simplicity, too much correspondence at what the teacher had described or what their books had represented and sometime the mismatch with the idea of the physics concept, are the products of the social and economic student; with fantasy, more focused and appreciate and more interesting are the models of the student of scientific high school.

Goerudio was a great opportunity to spend our energy to grow, change, propose and learn some educational aspects and new methodologies to teach science to our students. I hope we will be able to continue this sharing of knowledge.

After these speeches, Miglena Molhova from Bulgaria asked the following questions:

1. From your experience were students enthusiastic to work with the model method because it's new for them or you think they would appreciate this form, to support their learning also in future?

Massimo Amato from Italy answered as follows:

Yes, I think and hope that students could work with the method model to recognize immediately the aim of the lesson and, about me, I will use this approach to focus the target of the concept or content or idea of the lessons.

Laura Capella from Italy answered as follows:

I think, as I explained before, that students will appreciate this approach not only because it is new, even if that could be an extra point . I've noticed that for part of them this approach is not so easy because they



think they should be clever in drawing pictures, so they immediately refuse it, but when they understand that it isn't a matter of drawing ability they relax and do it, finding it more interesting going on in the project.

2. How would you estimate the level of difficulty of using the model method for students – did they find it easy or difficult? How important do you think the role of the teacher is in the implementation of this method?

Massimo Amato from Italy answered as follows:

Well, the model method is a big opportunity for students to translate theory in practice. But the teacher have to indicate or help to identify the right or the best model to permit to the students to improve their knowledge. In some class where students are not to prepared in science, this work will be more difficult, otherwise in high scientific school the model approach is easy.

Laura Capella from Italy answered as follows:

As for the majority of new methodologies, (it probably fit also older methodologies) the mediation of the teacher is important and is a good part in work/ as in learning success. You can't teach something in which you don't believe, it's very difficult if not impossible. A Positive approach is always due to gain some kind of results.

Personally I try several different approaches, not everything is useful for everybody but if it fit a good number of students, I appreciate it and try again.

I appreciate methodologies in which someone's creativity is enhanced, whatever it is. Goerudio method is one useful method for that.

Feedback of the Polish teachers (36,6)

Grzegorz Grodek (36,6 Competence Centre) started pointing out the main feedback received by the teachers during the analysis of the educational products. Polish teachers found interesting ideas to implement in their classes at school. Analysis of the work developed in the other countries enables to reflect on the teaching practice and introduce new methods in Poland. The overview of models created by students provides evidence of creativity and engagement. If students are given the right to co-develop the lessons, they feel more responsible for their educational process. Peer evaluation of educational models raises the comprehension of the scientific issues. Most of the Polish teachers' comments refer to products from the field of biology and mathematics. The ideas of models or lesson plans will be introduced at their lessons.

Teachers emphasize that students often question the sense of learning certain contents resulting from the programme, argue that the exercises are monotonous and not very interesting. The repository of products provides new concepts that can catch the attention and motivate the students.

With regard to the main feedback received by the teachers during the development of the educational products, Polish teachers focused their work on developing lesson plans and interactive science lessons. The lesson plans involve the students in group work through creating models and developing experiments. The interactive science lessons use computer programmes and multimedia resources, such as Stellarium (virtual planetarium), or SCRATCH (programming). Through the use of ICT and experiments the topics become more accessible and easier to comprehend.

The analysis of the subjects covered by the educational product show that mathematics was the most popular area (5 products created): area of geometric figures, geometric constructions (regular polygons), statistics, symmetry. Significant number of products was also developed within the field of biology (3 lesson plans): DNA, Human senses, Microorganisms. Interactive science lessons focus on technology/physics (electricity) and science (astronomy).

Feedback of the Romanian teachers (EuroED)

Elza Gheorghiu (Romania) presented the main features of the comments gathered in Romania.

With regard to lesson plans, Romanian teachers have found them:

- interesting plans stirring students' interest in geometry, chemistry, physics or biology through experiments or applied geometry/ science.
- appealing to different learning styles; involving students body and mind,
- captivating by making good use of games





- useful, connecting science with life: "I will take into consideration this plan and its ideas and use them in my classes. "
- applicable in real life: "They develop students' knowledge about how to live a healthy life."
- offering clear explanation and using simple language
- well-structured plans

From the other side, with regard to Goerudio models, Romanian teachers have found that they can be useful especially when abstract scientific concepts are first introduced to students. Students are asked to find similarities between the scientific concept and a familiar information with a view to integrating new information in their previous knowledge base. They use familiar information to explain unfamiliar information; and thus students build knowledge. The new knowledge is explored from different angles as students get actively engaged in finding explanations and applying the newly learned material to new situations related to their own experience. Thus, students get a better understanding of the scientific concept and make the learning process memorable and very personal. Goerudio models can make unfamiliar scientific concepts easy to understand, visualize and remember.

Romanian teachers have appreciated the Goerudio models as:

- interesting: "making connections between the theoretical concepts and what happens around us"
- innovative, intriguing, captivating: "A Goerudio model is an interesting exercise for the mind. It challenges students' mind."
- addressing all learning styles: e.g.: making use of drawings or pictures (visual students)
- very original, creative: "I think that Goerudio models offer plenty opportunities for students to exercise their creativity."
- a lot of fun
- memorable: " it helps students retain the scientific issue and continue looking for such examples and comparisons in real life." "an original way of retaining information"
- highlighting the importance of using examples from the reality students are familiar with whenever students are taught scientific issues;
- giving clear explanations offered by the association between an abstract concept and a common issue from real life;
- simple and easy to understand. "Students may understand better the main logic of this subject using this comparison.
- connecting abstract issues with familiar ones: "Science classes are full of abstract concepts, which are difficult to understand. Goerudio models help students understand them by relating them their everyday experiences."

Romanian teachers have expressed their intention to use Goerudio models in class.

"I am planning to use it because I find it interesting and useful."

"I am planning to apply this educational model to my students and after this I will ask them to explore and find another similar example for the concept."

"Students find it hard to make connections between concepts, definitions and reality. That is why I think this model is useful; it also captures their attention. The explanation is not very complicated with difficult words to understand; the language is familiar to them. I am planning to use this model with my students too because I find it useful."

"I believe teaching science using Goerudio models has changed my teaching. I have noticed how much it has enhanced my students' motivation to learn chemistry. Active learning makes knowledge lasting. It helps students get meaning out of their education."

The Goerudio educational models have been further used in a CLIL programme, where students have developed not only their knowledge and understanding of the world but also their language competences.

Romanian teachers have also appreciated the exchange of ideas over the uploaded models. "Goerudio models trigger new ideas and as a result generate new Goerudio models."

Feedback of the Slovak teachers (Transfer Slovensko)

Juraj Dubrava (TRANSFER Slovensko) presented latest Slovak activities within the project.





TRANSFER have been organized one workshop on 30 of March 2015 with the aim to guide the teachers through the creating models in scientific. This was second national workshop for our teachers. Workshop was focusing on:

- To strengthen cohesion this group of teachers and experts of this project for the better experts understanding of the project goals
- Motivate teachers and experts to use Goerudio modeling methodology by creating of the education materials for the next goals of the project Expert presentation and group activities
- Be able to understand other education products as models or lesson plans and create comments to this products

Vlasta Dubravova takes contact to Department of the Didactic of mathematic and physics and invite expert for inovative teaching methods doc. Demkanina PhD., with the aims that this expert should moderate this part of the workshop.

Expert presented your own expert approach to the connection of the innovation in teaching process in scientific topics. As member of commision which presented new concept of teaching scientific topics on primary and secondary schools in Slovakia, he support using methods which activite students and lead students to better understanding of the scientific topics. He underline needs of the teachers education in work new ITC technoligies that and underline that modeling methodology is not ver using in education process but this method can increase topics understanding by students. He realise with teachers some activities and commented materials and work wirh Goerudio models methodology. This all was very interesting for our teaches but they have more benefits and inspiration for modeling from Goerudio approach that are realise in Riga as from our expert.

Specific approach by the development of our educational products is that our teachers are from vocational secondary schools. what is our weekness and strengts together. That approach we will presented on our final conference in Riga.

From all 13 educational products teachers prepare 7 educational models and 5 lessons plans. All educational are focusing on vocarional secondary schools for 1 and 2 class and for 9 class in primary schools. Topics were 5 from maths, 2 physics, 3 chemistry, 3 biology. Content of our educational products based on slovak schools educational programmes and standards. Aims of this educationsl products are focusing on better understading of scientific topic , on more cognitive area and this cognitive aims are focusing on in some products on social skills and application in practice. In some educational product are not complete lesson plan but only example of models in this topics. Some products are very complex and some only in partial concrete analisys of all our educational products we have in separate material.

Feedback about teachers comments:

Quantitative analysis:

We are 24 comments from this are 14 teachers and 10 students commnets. 14 teachers comments are in following structure: 7 comments from mathematics, 2 from physics, 2 from chemistry, , 2 from methodology and 1 from ICT. Our teachers have done 5 comments from Poland, 2 from Spain, and 1 from Italy, Bulgaria and Romania.

We adapted questions in form WP3.E with the aim to have more detailed informations about educational products and about development of the educational products.

Teachers comments:

1.What do you think about of the hole pedagogical source created by the teacher from partner country?





- all comments of the educational products are positive, teachers appreciate that some of products are created as complex activity in which teachers cooperate from more scientific topics and working with models.
- models connected teaching for example (mathematics) with student experiences and with concrete topic. Teachers positively evaluate work with models, find inspiration in some finished models, which created teachers together with students
- teachers appreciate different forms of education processes such as excursions in shopping centres, in which can teachers involve connect in education process many different scientific topics, developed practical, skills, social skills, mathematics and financial skills etc.
- teachers appreciate methodological approach and initiative from colleagues from Riga and verify that this approach can more involve students to the educational process and can increase their effectiveness
- some critical remarks have teachers to educational products which are very short and can't be used in class

2. How can a proposed source (lesson plan, activity, model) help to overcome disinterest or lack of motivation for the study of natural science subject? (please write down your opinion as concretely as possible).

Student motivation for scientific topics can increase:

- when student can alone create some principles
- when scientific topic allows to understand that this scientific knowledge can be used in practical real life
- when teachers' initiative (models, example, text etc.) are interesting, easy to understand and with some humor
- when this approach is for student easier for understanding a supported interest for the topic with some secret (we will see what happens)
- modeling and their using in education process appreciate all teachers as way of increase interest for students

3. Are you planning to use this source? If yes, how will you adapt for needs of learning process in your school,

- for our in project involving teachers is this modeling approach very inspiring and interesting and will use this in education process
- some teachers find inspiration for our own adaptation for your own lessons and for school materials
- involving students to this project, teachers find out how students perceive their education process, what expected and what is the best way for understanding scientific topic

10 Students comments:

- all students are very positive and appreciate all education products in which student can see how things are working
- comments games and appreciate all products which are working with models, they believe that approach can help them to better remember and understand concrete scientific topic, they think that can create models from some topics
- appreciate videos from youtube and presentations from scientific topics from connections with real life in which they can see materials, processes, functions etc.





Feedback of the Spanish teachers (Alqueria)

Ignacio Pachés Giner (Spain) reported the feedback received by Spanish teachers by saying that their teachers have given different opinions on the several models, they have analyzed and even used. Most of the feedback has been positive in two directions:

- 1) The benefits of some very accurate and descriptive models which are taken from everyday life situations. They show the strength of the goerudio method and they pose a motivation to keep producing and pursuing good models.
- 2) The discovering of clever models for several concepts which seemed difficult to model in the first place. These models encourage the teachers to consider producing models for most difficult concepts from many subjects.

With regard to the main feedback received by the teachers during the development of the educational products, teachers have agreed on several opinions when dealing with model producing activities in their classes.

- 1) The progress made by the students from first day until finally getting full comprehension of the goerudio model.
- 2) The ability to accept good models or reject bad ones achieved by most students as a complementary activity to producing models.

Conclusion of the Virtual Meeting (RSTS)

Romans Vitkovskis from Riga State Technical School drew the conclusions of the virtual meeting.

He is glad to notice that teachers and partners all around Europe have reacted to the Goerudio method according to his expectations. Despite of some initial skepticism towards this methodology, it seems that the majority of teachers are accustomed to this new method. This new teaching way received the more enthusiastic feedback by the students and also this point was quite expected because of the newness of this method.

In spite of initial difficulties, partners, teachers and students found a way to work with the Goerudio method. What teachers and students need are a simple and easy-to-use resources and Goerudio models fit very well with this necessity. Above all partners and teachers found a way to simplify and customize the proposed methodology and this helped the diffusion of Goerudio proposal.

Other advantages arising from the activities with Goerudio method lay on the fact that the production of Goerudio models has also been funny for students and involved them personally. These aspects cannot be neglected for the positive when we evaluate the final balance of the activities

All the above aside. The main strongest points of Goerudio method to be highlighted after this testing phase are the following:

- Users quickly and easily become accustomed with the operation of the method;
- This methodology can be used on a wide scale with regard to the subjects it is applicable to;
- This methodology can use many channels starting from text up to videos;
- It does not need special equipment but it can be implemented within whatever environment;
- It goes beyond "one school walls";
- It forces students to think out of the box to know what happens inside-the-box (that is, how a specific scientific concept works).

Knowing the high quality of the results achieved by the partnership, Romans Vitkovskis pushed all the partners to spread them among the broader audience possible and looked forward to meeting all the partners in Riga for the final meeting.

