



518300-LLP-2011-IT-COMENIUS-CNW

Chemistry is All Around Network Workshop on "Student's Motivation" Gabrovo (Bulgaria), 21.09.2012

Minutes

Participants

The first workshop on the Chemistry is All Around Network Project, dedicated to the motivation of students to study Chemistry was held on 21.09.2012 in the conference room of the University Library of the Technical University of Gabrovo. It was attended by teachers of chemistry - representatives of all schools - associates of the Technical University - Gabrovo project, as well as representatives of universities and organizations as experts: Milena Koleva, project manager – Technical University of Gabrovo; Peter Rachev, teacher – Vocational High School in Electrotechnics and Electronics, Gorna Oriahovitza; Mariya Nikolova, teacher – Aprilov National High School, Gabrovo; Katusha Stancheva, expert – Regional Inspectorate of Education (Ministry of Education, Youth and Science), Radka Krasteva, teacher – Vocational School in Electronics and Chemical Technologies, Pleven; Daniela Petrova, teacher, Vocational School in Electronics and Chemical Technologies, Pleven; Krasimira Tomeva, teacher – Professional Mechanoelectrical High School, Sevlievo; Rossitza Dimkova, teacher - Professional Mechanoelectrical High School, Sevlievo, Sevlievo; Galina Kirova, teacher - Vocational School in Electronics, V. Tarnovo; Ilka Boyanova, teacher – Aprilov National High School, Gabrovo; Hristo Kolev, expert – Sofia University, Sofia.

Minutes

The meeting took place in accordance to the previously agreed **agenda**, as follows:

- Introduction of participants;
- Project "Chemistry is all around Network" - goals, objectives, ongoing and future activities;
- Presentation of reviews and opinions for the posts of the project partners concerning students' motivation for learning chemistry
 - Discussion: "Motivation - How to achieve it?"
- Presentation of reviews and opinions for the educational interactive materials for teaching chemistry
- Discussion: Using interactive forms of education as a tool to increase students' motivation for learning chemistry;
- Final remarks, conclusions

Each of the participants in the meeting briefly presented themselves and the school or organization that they represent as well as the process of teaching of chemistry in their school.

Milena Koleva, contact person for the project "Chemistry is all around Network" for TU - Gabrovo, presented to the participants the goals and objectives of the project achieved so far, the expected outcomes, and the future activities to be performed as well as the commitment of teachers and experts in them.

Through short presentations teachers and experts presented their views on the publications and articles on students' motivation, available on the project website as: "POPUCH - Popularization of Chemistry", "STUDENTS' MOTIVATION TO LEARN CHEMISTRY: THE GREEK CASE", "THE PROBLEMS OF CHEMISTRY AND SCIENCE TEACHING IN SPAIN", "CERP - CHEMISTRY", "STUDENTS' MOTIVATION IN SECONDARY SCHOOL CHEMISTRY TEACHING USING COMMON LIFE TASKS", "The motivation of students to learn Chemistry" etc.

The presented publications and the comments concerning them served as a basis for discussion 'Motivation - how to achieve it'. Some of the opinions expressed are summarized below:



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Peter Rachev: in order to motivate students to do something, you have to grab their attention. In this respect the personality of the teacher is of great importance. He or she must find the correct approach towards the students, knowing their capacity and interests.

Daniela Petrova: Chemistry is a specific subject and to achieve the necessary standard of assimilation of information you have to “visualize” things. In this respect the insufficient, outdated and sometimes even missing laboratory equipment is a major drawback of the contemporary teaching of Chemistry in Bulgaria. Yet another problem, concerning especially the young people, is their limited chance to succeed on the labour market. The Business is the missing part which fails to close the cycle “school – university – career” and having failed to do so, we can hardly talk about students’ motivation to learn Chemistry – something really important, especially for the vocational schools.

Hristo Kolev: demonstrations are of great help to visualization of the chemical phenomena and lessons, sometimes with available resources only - the important thing is that they should not only be attractive, but also should define their relationship with practice and life. The teacher should take the role of science communicator.

Katusha Stancheva: in order a process of teaching and training to be successful, students must become its focal point – that is the best way to motivate them. A similar opinion is shared in one of the publications on the site.

Mariya Nikolova: another interesting and effective approach to involve students in the learning process (presented in one of the posts) is bringing chemistry to them through the work of outstanding students as researchers in the laboratory, after which they are included in the delivery of lessons and serve as “ambassadors” of chemical science among their classmates. This is a way for them to be active participants in the learning process, which motivates them to study chemistry at school.

Krasimira Tomeva: this would work as an individual approach based on the students’ involvement and interests. Tasks related to practice help to increase students’ interest in the subject. That is why the topics for discussion in class and the homework must stimulate students’ interest – this will make students more active in class, which will finally lead to a better grasp and assimilation of the scientific content.

Daniela Petrova: the inclusion of the science in the process of teaching Chemistry at school is another way to attract students’ attention and motivate them. The e-magazine CERP is a fine example of that. The variety of information offered by the magazine online would stimulate the students to go further into Chemistry and would stimulate their inquisitive and innovative spirit.

During the second part of the workshop the teachers and the experts shared their opinions on interactive teaching materials on Chemistry available at the portal of the project and their relevance to the increasing of students’ interest in Chemistry: Chemoffice, Chemistry demos and activities for science 9 and 10, ChemsSketch 12 software, 50 Really Cool Online Tools for Science Teachers, A Química das coisas (The Chemistry of Things), ArgusLab, P-net – interactive simulations, Interactive Periodic System (University of Nottingham) etc.

Topic of the subsequent discussion was the use of interactive materials in the process of teaching as a tool to stimulate students’ interest and increase their motivation to study Chemistry.

Hristo Kolev: to be an internet - based product useful and to be used in class, it is necessary to provide sufficient scientific information and present it in an accessible and attractive way to the student. I recommend Chemistry demos and activities for science 9 and 10 especially to teachers, because they are user-friendly and have a wide range of tools for visualizing formulae, structures and processes.

Daniela Petrova: I was impressed by ArgusLab, via which the learning of Chemistry is just fascinating. The software tools are manageable for students of secondary schools. To use interactive materials in class, however, requires both time and proper equipment. The actual state of affairs in many Bulgarian schools, however, would limit its use as a textbook in class due to lack of computers, the time constraints of lesson periods and the different level the students have in English.

Maria Nikolova: a major disadvantage of present day Chemistry teaching is the extremely theorized course, which makes the subject incomprehensible and discouraging for students. It is necessary the offered





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knowledge to be supported by a real use in life and practice. I strongly recommend to my colleagues to learn about the opportunities offered by A Química das coisas (The Chemistry of Things) – the material is extremely useful as it introduces the application of chemistry in life. The understandable language, the looks of the presenter and the appropriate duration of the episodes (about 15 minutes), make the material interesting for students. The product is innovative not only for schooling, but can be used by people of different ages who are interested in chemistry in the world around us - thus the mission of lifelong learning is carried out.

Finally, participants in the meeting agreed on the following:

1. Motivation is an important factor in the learning process, as the teacher facilitates and underpins students' desire to acquire new knowledge. Key factors in the motivation of students are the teacher's qualifications, character, temperament, qualities, approach and attitude to the students.

The main reasons for the lack of motivation for learning chemistry can be identified as follows:

- Material is theorized;
- Lessons are monotonous and uninteresting;
- Knowledge is not practical and useful;
- Lack of understanding of the material and hence difficulty in learning it;
- Lack of laboratory facilities and possibilities for the visualization of processes, etc.

Possible ways to increase students' motivation could be:

- provoking students' interest by using more user-friendly and interesting materials, and solving practical problems associated with phenomena of everyday life;
- a more interesting and effective presentation of the material via multimedia lessons, games and exercises;
- teaching to become a positive emotion for students;
- Illustrate the material to its practical realization through industrial tours and visits to companies;
- A change in the teaching approach designed to encourage practical work on the problems of motivation, project work and networking.

2. Effective tool for the practical implementation of these guidelines can be multimedia products developed based on the modern Internet - technologies that allow to link the skills and interests of today's web – generation to Chemistry curriculum, updated with the achievements of science in this area.

Suitable for teaching, are these web - based materials that have been developed in a simple scientific language, do not hinder students in using them, allow independent teamwork and enrich the theoretical knowledge and practical skills of the students. Examples include products such ArgusLab, Chemoffice, 50 Really Cool Online Tools for Science Teachers, A Química das coisas (The Chemistry of Things),

