

Chemistry is All Around Network Workshop on "Successful Experiences" Limerick (Ireland) March 26th 2014

Minutes

Participants

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Grace Kenny, Ahane National School, Limerick
Peter Childs, CERG, University of Limerick
Angela Gammell, St Joseph's Spanish Point
Marie Walsh, Limerick IT
David Sutton, Limerick IT
James Ring, Limerick Civic Trust
Claire McDonnell (via Skype).
Ciara Ni Driscoll (via Skype)

Minutes

The agenda for the day was distributed to the participants. Two associate partners were introduced to the group.

The meeting was started by Marie Walsh who gave an overview of the project to date. This included a report on the conference and meetings in Limerick and the requirements for this phase of the project.

It was noted that website needs to be kept more up to date. Information relating to the meeting in Limerick is still on the homepage. Information should now be available for the meeting in Portugal.

There followed a roundtable description of resources reviewed by each participant. Where possible the items reviewed were displayed on the screen to illustrate their usefulness.

Report by Ciara Ni Driscoll (Skype report):

- Using videos in the Chemistry class: This initiative looked at the development and use of videos in teaching chemistry to help pupils who missed a class or wanted to recap a lesson. A batch of videos were produced. Pupils accessed the videos, it was reported that a large volume of pupils accessed these videos however no statistics were shown to back up the success of this project
- Activities using Hydrogen Peroxide: This paper focused on three activities using hydrogen peroxide. There were some useful ideas emerging from this paper. It was relevant to current coursework in Junior Cert Chemistry.

Report by Rose Lawlor: General comment: Translation caused some problems in interpreting the papers.

- Successful experience in Primary School Science Education: Primary science project, that looked at micro learning and marco learning in Science. To avoid the problems caused by the abstract nature of the micro

pupils took part in laboratory based activities instead. Activities looked at activities relating to solutions. The teachers acted as facilitator of learning. Pupils were encouraged to argue their ideas to come with an answer.

- Teaching Chemistry at school: A group fifteen of 15-18 year olds were involved in this project. They involved pupils who were interested in the arts and humanities. The context of the learning was the science in 'Granny's Chest'. The Chemistry, Biology and Physics teacher were involved in aspects that related to them. The Biology teacher looked at the natural dyes in threads, the physics teacher looked at the physics of a spinning wheel and the Chemistry teacher looked polymers and the composition of the threads.

Report by Mairead Glynn:

- Digital simulation and experimental activities in physics and chemistry. Pilot study on the impact of the resource "fusion and boiling points" with level 7 pupils from Spain: The paper looked at a virtual lab where pupils looked at various chemistry experiments. Pupils liked the simulations and felt that it made the Chemistry easier to learn. Results of worksheets showed pupils understood the concept. Initially the pupils were distracted and overly excited but this was gotten around by the facilitators. This paper initiated a discussion relating to the use of Virtual Laboratories and how they could possibly complement the actual laboratory experiences. There was a lot of discussion about virtual laboratories and simulations.

Report by Michelle Herbert:

- Planning and Realisation Concept of the Inquiry – Based Science Education in Science Education: The paper stated on a negative vein listing the problems associated with inquiry based learning. They felt teachers weren't prepared. It did state how useful inquiry was but did little to solve the problems they mentioned for the bulk of the paper.
- Pre-school science education in Portugal: teachers education and innovative practices from the Journal of emerging Science. This report looked at the state of science in pre-schools. It didn't state the resources they were using. The paper didn't state how they introduced scientific words. It was lacking in finer detail.

Report by Maria Sheehan:

- English for Chemistry: FILM BANK: English for Chemistry aims to provide materials for teaching English for specific purposes. The film bank includes a set of listening comprehension, complementary reading and vocabulary exercises based on a variety of chemistry subjects. One of the main objectives of the project was to improve the quality of specialist vocabulary by using authentic chemistry materials. The paper gives a sample of this material relating to the chemistry of Chlorine. Activities appear to be closed tests where pupils substitute in the correct work in a passage of text. A lot of work has been put into the development of these resources and they have potential to engage pupils and as a result help with the subject specific vocabulary.
- Fostering the use of ICT in Pedagogical Practices in Science Education: Fostering the use of ICT in Pedagogical Practices in Science Education (FICTUP) aims to create initiative training materials using ICT accompanied by a close tutoring process. It also aimed to test the impact of the initiative in novice teachers' use of ICT in the classroom. The training materials for this project were developed collaboratively by experience and novice teachers to help with the transfer of knowledge. The resources available are video clips and a pdf explaining the activities associated with each lesson. A large bank of resources have been developed for this initiative. The approach in this project aims to link the Resource Based Learning (RBL) approach with the use of ICT. The papers lists the following contributions as such examples:

Report by James Ring

- Chemistry Education – The Relevance of Innovative Pedagogical Practices in the early years, a paper by the Portuguese partners gave an insight to the Portuguese government approach to teaching science and chemistry from kindergarten onwards. The rationale is to make this part of the vernacular, and therefore a subject that grows with the children rather than being forced on them too late.
- Teaching Chemistry with a new cooperative model in the classroom – a paper by the Spanish partners – repeats the need for a constructivist approach as already identified by all partners. It also promotes the use of context as a means of making Chemistry more attractive to students.

Report by Michelle Starr:

- 3D visualization types in multimedia applications for science learning: A case study for 8th grade students in Greece: The introduction of this paper was really useful in discussing how pupils learn. This project developed a multimedia presentation on separation of mixtures. The control group used static pictures. Results indicate that an overall increase in the interest of pupils who were using the multimedia resources. The pupils using the static visuals gave the same correct answers, no evidence suggested that the multimedia activities helped developed understanding. There was cognitive overload for the experimental group as they got to grips with the new methods for presentation of materials.
- European ICT survey for schools: The ICT infrastructure in schools is good across Europe. It was reported that ICT was used to prepare lessons however not a lot of ICT is used during the lessons. Pupils use ICT activities at home more often than in school. ICT training is not compulsory for teachers. The report recommends the use of ICT in class, teacher training, and teacher incentives.

Report by Angela Gammell:

- Experiences in the laboratory for the gaseous media in the lower school: This paper looked at activities relating to the mass of air. It was targeted at upper primary or lower secondary. The paper was difficult to translate. Teachers reported that it wasn't feasible to spend so much time on that topic. No facts or figures were reported but students found the activities involved interesting.
- Cooperative work in Science lessons: A key but still underused strategy: This paper was very difficult to translate. It reported on an initiative training teachers up in cooperative teaching. The overall conclusion was that cooperative learning was a good thing.

Report by Grace Kenny:

- Activity approaches for teaching Chemistry: EU funded project relating to active learning methodologies in Chemistry. The translation of the paper caused problems. Pupils research their topics and returned to the classroom to take part in more informed debates. Cartoons were used to present chemistry topics.
- TALNET- Project for inquisitive youth: Challenges offered to talented pupils relating to Chemistry. No indication to how successful the initiative was. Concerns were raised that it might not encourage pupils to take Chemistry as it is targeting those that would already be interested in Chemistry.

Report by Claire McDonnell (via Skype):

- A Science Teacher Education Course in a Science Centre: A Successful Strategy to Empower Teachers to Master Museum Resources Exploration? This is a novel project. They developed a training course which counts professionally for primary teachers which relates to informal learning in science centres and museums. It consisted of four 4 hour workshops. Results looked at a number teachers and observed visits. It noted an overdependence on workshops, there was also a lack of pre and post work before the visit. The paper did not make clear how issues raised were addressed.

- Chemistry in the Kitchen: This looked at the context of cooking for teaching chemistry. They focused on acids and bases and looked at dilutions. They used historical models for acids and bases. It's a practice based model, pitched at primary school pupils.

Report by David Sutton:

- 'Earth belongs to all of us' – an interschool project on the impact of mineral fertilisers from Bulraian publications describes a unique approach to a research topic in that there are two separate study groups employed in the research from two different level schools. One school was involved with the theoretical aspect and the other with experiments. The publication suffers from a lack of Chemistry explanation.
- A paper from Greece 'Exploring the phenomena of 'change of phase' of pure substances using the Microcomputer-based laboratory (MBL) system is a very good clear and useful explanation of a project using a problem-based learning approach with a practical aspect. Particularly useful is the worksheet employed by the authors which clearly sets out the concept.

Report by Ciara O'Shea:

- Some strategies to improve performance in school chemistry, based on two cognitive factors by Eleni Danili & Norman Reid: This paper looked at two cognitive factors in the chemistry class. It looked at working space memory and their field dependency. They tested pupils for these. Teaching resources were developed to lesson to load on working space memory. These resources related to atomic theory and took a different approach to teaching atomic structure. They used models and dialogue boxes where pupils could clarify the concepts for themselves.
- Fluorescence: an Interdisciplinary Phenomenon for Different Education Levels. By Spanish authors J.A. García, J.M. Moreno, F.J. Perales, J. Romero, P.Sánchez, L. Gómez Robledo: This looked at how you could teaching everyday concepts using florescence. They looked at applications, health education and got pupils working groups. They worked with primary school pupils.

Workshop members broke into groups and discussed how they have used materials available on the portal:

Group 1:

School level – Primary

Area of syllabus: Changes of state.

Resource used: www.planet-science.com

How resources are used: The website listed above includes videos as stimulus to engage, interactive games relating to the concepts and suggested activities to develop the concept of changes of state at primary level.

Group 2:

School level – Upper secondary

Area of syllabus: Environmental Chemistry (water, pH, acids and bases, atmospheric chemistry)

Resource used: www.chemistry-is.eu (Chemistry and the Environment)

How resources are used: The website listed above includes videos, multiple choice question quizzes, useful links to other resources and instructions for practical activities to enhance the teaching of the concept.

Group 3:

School level – lower secondary

Area of syllabus: Atomic structure and Periodic table

Resource used: 50 really cool online tools for science teachers & www.scienceunleashed.ie

How resources are used: atom builder, sub atomic particles, uses of the different elements, Salk's periodic table on the portal is very useful.

Each group presented the resources they would use and put them in the context of a lesson sequence.

This activity was followed by a general discussion on resources and successful experiences. Once again the RSC Learn Chemistry portal was cited as being a source of a myriad of resources for all levels and teaching approaches. (www.RSC.org/learn-Chemistry). The precursor project Chemistry is all around us with its teaching units was once again praised for its content. The comparison in terms of attractiveness of the two portals was noted.

Some of the teachers spoke about the reactions of their students to particular resources. Marie Walsh has gathered surveys from students and teachers that will be summarised at a later date.

The meeting ended with the collection of the portal evaluation questionnaires.

The participants were thanked for their on-going commitment to the project.