EEPG Science and Math Network meeting in Warsaw, 19-20 April 2007

Participants:

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Wednesday, 18 April: Welcome dinner in Sobieski Hotel

Thursday, 19 April:
Morning session:

Welcome session, presentation of and by the participants

First topic: Which kinds of materials are being produced and/or planned to help students with learning problems (disabilities) in subjects like Science (Physics, Chemistry, Biology) and Maths

Wojciech Jedrychowski (WSiP) talked about e-assessment in the project ‘Mathematics 2001’- in the past, the present and in the future. He mentioned the different examination systems in Poland including the two levels of national exams in compulsory education. One exam is at the end of primary school (age 12), and the other is organised after secondary (age 15). Detailed description of the two exams can be found in the presentation (see below). The results of the second exam are decisive for entering the college (gymnasium), so it creates a lot of stress. The Mathematics 2001 project adds materials to the normal textbooks, i.e. 6 CD-ROMs: one for each grade (10 – 11-12 year-olds and 13-14-15 year-olds). In addition WSiP produce assessment materials (on the CD-ROMs) to assist the teachers in evaluating the maths level of the pupils. Then followed a presentation of the CD-ROM for the 1st grade of secondary showing mock exams, short diagnostic tests, homework tasks, and reports on each student’s progress (and weaknesses), also the overall level of the whole group or class [please click here to see the presentation].

Mare Herlevi (Otava Publishing Company) showed 3 cases of materials for disabled pupils/children with special needs covering the subjects Physics, Chemistry and Maths. There is an increased demand for materials for students with learning disabilities in Maths, foreign languages, native language, Physics and Chemistry.
Sometimes an individualised curriculum for disabled children is organised – but often the parents are against that their child should be disabled and different from the other children. Such materials have to cover the same topics as the national curriculum for that subject.
Differences to normal books in this kind of materials include:
Less subject matter, less text, simplified language, workbook included in the textbook, bigger fonts, and minimum hyphenation.
(In the presentation you can see example spreads first from the normal textbook, and on the following slide you will see how the easy version looks) For the series Pi Maths 7-9 Otava have produced a Pi Special Book for weaker learners, presenting one subject per spread and offering space for writing answers directly into the book [please click here to see the presentation].

Martin Nyman (Natur och Kultur) presented the series PULS (science for grades 6-9). This series has now been more than 20 years on the market. What is the definition of learning disabilities? There are two answers: Liber (the main competitor in Sweden) does it like this: less text means easier! So they publish the books for weak learners simply with half the text. Another way is to take out whole topics inside a theme and then widen the remaining chapters. This is what Natur och Kultur has done: There are two target groups for this special material: a) poor readers, and b) pupils with a different mother tongue. What makes a book easy to read? 1: the text in itself, 2: the layout, 3: conceptual support in form of maps and diagrams (high interaction between pictures and text), 4: larger text and line spacing, no words in bold or italic fonts, no hyphenation, 5: numbered lines (every fifth line is numbered – easier to find a chunk of text), 6: personalised voice of the text. In addition Martin Nyman showed a web page financed by the city of Stockholm (www.webbmatte.se) where people with non-Swedish mother tongue can choose between Arabic, Russian, Somali, Persian, Spanish and learn Math and Physics in their mother tongue as well as in Swedish [please click here to see the presentation].

Linda Zemite (Zvaigzne ABC Publishers) explained the situation in Latvia. The Ministry makes a competition for publishers (a tender), and the winner is allowed to produce the book which gets approved. There are special schools only for children with learning disabilities. Linda Zemite also presented some sample pages from a Maths workbook for the weakest learners which could also be used also in kindergartens and preschool learning for normal children. Zvaigzne also produce a series of workbooks for Maths for grades 1 to 6, all for weaker learners. A special book teaches time measurement (grades 7-9), and this is the only workbook not funded by the ministry. A brand new series for Maths grades 1 to 6 is going to be published soon [please click here to see the presentation].

Regimantas Baltrušaitis (Alma Littera) presented a textbook for students with learning problems for Maths (grade 1) and another similar ‘normal’ textbook for the same grade. The two books have exactly the same volume and size. He also mentioned the different types of learning disabilities (mental, hearing, corporal, social etc). There are only two or three special schools in Lithuania for such children. In general all learners – including the weaker ones - are now being moved into the secondary school, which poses a big challenge for publishers. Only 10% of all weak learners attend special schools, 90% attend the normal schools, and this is a very difficult situation. There is a political and social demand that all children should be together, and that there should be no marking of special problematic children. The authors of these special materials are experienced teachers who know the disabled learners from many years of teaching. The normal book is printed on 10,000 – 15,000 copies while the special book is printed in 1,000 copies only [please click here to see the presentation].

Second topic: How can/do educational publishers assist teachers in engaging and motivating the students especially for Math and Science (e.g. getting girls interested in Science and Maths)

Katarzyna Golimowska (WSIP) described different approaches to raise the interest for chemistry. The three textbooks in the series ‘Exciting Chemistry’ are all accompanied by a CD-ROM. This package presents a very comprehensive collection of different materials. Every chapter is put in question forms; there are specific modules to encourage students to learn on their own and to learn collaboratively. Extra features include experiment descriptions, many categories of photos, illustrations showing phenomena which cannot be seen (e.g. molecular structure), diagrams, outlines (structograms), tables etc. Furthermore there are specific modules on “Find out more”, biographies of famous scientists, and activity books on experiments students can do alone without any risks. There are also books specific for the teachers with didactic hints and inspiration regarding how to teach dyslexic and isographic children. The presentation contained numerous examples of the different types of tasks, games, exercises, laboratory experiments, films, puzzles, cosmic adventure games etc. on the CD-ROMs [please click here to see the presentation].
Martin Nyman (Natur och Kultur) described a new project on how to make Math funny: ‘Maths without calculations’. The main focus is on the poor learners, but in addition there is demand for stimulating the gifted learners (which is not politically correct in Sweden now!). There are 8 types of tasks and 12 tasks in each type [please click here to see the presentation].

Tivadar Szabo (Nemzeti Tankönyvkiadó) explained how one can increase interest in Maths (age group 10 to 14) by focussing on skills where numbers are used in everyday life, and by presenting visual experimental tools, practical explanations, tasks for differentiation, and interactive animations (on the company web site animations are free for download!). Elements of motivation include illustrations, games, interesting subjects and problem solving. There are also examples of how to combine Biology and Physics with Maths. The concepts were chosen with regard to the interest and motivation in the pupils. The animations are really free. The presentation included a government funded web site with free stuff for teachers, but the access is rather old fashioned and difficult (www.sdt.sulinet.hu). Here Hungarian teachers can find among other things more than 5,000 animations and hundreds of exercises for all subjects [please click here to see the presentation].

In the evening the participants attended a special event where the young and very gifted piano player Pawel Filek played several pieces of Chopin during a highly impressive hour. Later WSIP organised a dinner in the Old Town area of Warsaw.

Friday, 20 April

Third topic: Successful and not successful stories of books/series for Biology and Chemistry (presentations by the participants)

Regimantas Baltrušaitis (Alma Littera) talked about an unsuccessful story about chemistry. The company had not received the official approval in time at the end of March (2 years ago). Therefore they made a small print run and gave the Chemistry book for free to a number of schools. It was a success, but the next year the author (a professor at university) lost interest in the project and did not follow up the success. Consequently the teachers lost confidence in Alma Littera, so the lesson learnt is that it can be dangerous to depend exclusively on one author. Now they are planning a brand new series with a group of well selected authors. This year they cover science, history, Lithuanian language, Lithuanian Literature; this integrated series will hopefully be a success. The books have the same layout, the same format, same structure with spreads [please click here to see the presentation].

Maruta Kusina (Zvaigzne) showed a successful book for grade 5 which integrates the subjects biology, chemistry and geography. However, some teachers complained that there were too many practical tasks. Interestingly the Ministry said that biology is too complex, and that the children should only learn it so they can appreciate and enjoy nature. Therefore the book had to be simple, the book was for grade 8, but there is too little text (the teachers said). So now Zvaigzne have made a new biology book with a new author who added many things to the old book and made it much more comprehensive, so now it is a clear success. Maruta Kusina presented the structure of the whole new biology book (the Ministry says there are too many pictures, but still the book was approved) [please click here to see the presentation].

Thor-Atle (Gyldendal Undervisning) talked about a Math series, a truly successful story. The project started 4 years ago with a plan to produce Math books for grades 1 to 7. They had to be innovative to conquer the market and they got inspiration from New Zealand and USA. They used to have 10% market share before the new curriculum started in 2006. The idea has been to begin every topic with very concrete example, then go to a semi-concrete level, then to a semi-abstract and finally to a completely abstract level. The teacher’s book was very important and comprehensive to assist the teacher in planning. The market share grew last year from 10% to more than 50%. The book series also has its own web site (www.gyldendal.no/multi).
Wojciech Jedrychowski (WSiP) described the history behind the big project 'Mathematics 2001' that covers 6 grades in total. The starting point (14 years ago) was to make something really new for Maths. A small team of 2 persons were responsible for all aspects of the books from planning to producing, marketing and selling (new approach!). This start was successful and later the number of responsible persons was increased to 5 persons. The project was invented and led in academic circles, but they worked closely together with teachers. The series was written by a team of 10 persons, led by three chief writers, two from the university and one distinguished teacher. The chief writers received monthly salaries (negotiated every year with WSiP). Every part of the books has been trialled in classes (about 1,800 pupils in total in the first trial). 54 teachers were testers, covering different types of schools (large towns, villages, countryside etc.). In addition a group of consultants monitored and assisted the testers (in total 40 consultants). Furthermore they organised a series of workshops for testers, teachers, and consultants. The second testing trial covered 10,000 students, and this edition was paid for by students. Each package per grade has one textbook, two workbooks, one additional exercise book (for weak and for good learners) and teacher's guides, and for each grade there are CD-ROMs. The series now covers 20-25% of the market [please click here to see the presentation].

Tivadar Szabo (Nemzeti Tankönyvkiadó) presented textbooks which integrate chemistry, biology and physics. Each subject has its own book, but the cover, layout, and overall structure are identical in all three – so the look makes the coherence between the subjects clear. The three books are for age 15-16 (i.e. grade 9, the first year in High School). There are many different varied types of tasks in all 3 books (graphs, puzzles, readings, true-false, sentence completion etc.). The presentation shows many pages from the books describing the layout and content in detail. Not so successful was a textbook for Biology for primary. The book turned out to be rather a handbook than a textbook – it was too heavy, too loaded with content. It is very much used in school libraries, but it is not a success as a textbook [please click here to see the presentation].

**Fourth topic: Learning objects in Math, Physics, Biology etc. Discussion of the possibility to set up an EEPG internal pool of so called learning objects to be used by all members of the EEPG.**

Paul Tarábek (Didaktis) presented ideas of professor Brockmeyer and her thoughts about didactic communication in physics. He presented the various phases in the process of didactic communication. Between each phase the knowledge undergoes a didactic transformation, a shift between analysis and synthesis. As an example Paul Tarábek described when the atom model should be presented to learners; some countries already do it in grade 6, others in grade 9 or even 10. Question: Can children in grade 6 really understand this model? Maths concept levels include 1: empirical level with a word and a semantic image), 2: an icon level (e.g. five dots as an icon for 5; word + icon), 3: symbolical level (word + icon + symbol), 4: formal level (the core is now fully separated from the set of semantic images; core=word + symbol + (icon); and it is possible to have various interpretations of the core into reality) [please click here to download the presentation].

Preben Spåth (EEPG) presented various definitions of the concept of Learning Objects and gave hints about web site and literature to learn more. The background for this issue was a decision at the meeting of this network in Stockholm 2006 that it should be discussed if there is an interest among (some of ) the members of the EEPG to build a pool of Learning Objects where such digital objects could be accessible for other members – either for a fee or for free. In the discussion that followed some problems were raised, e.g. is the pedagogical approach behind given Learning Objects the same in all countries? Also there should be defined standards as to the platform used in producing such objects. On the other hand several participants expressed interest in the idea, and as a conclusion it was decided to let a small working group prepare a paper describing the idea in more detail. This paper will be presented to the Management Board and later put forward to the members for discussion at the general Assembly in Frankfurt 2007 [please click here to download the presentation].

**Fifth topic: Has the use of ICT and Internet and smart boards led to changes in the teaching methods practised in the classroom? If so, what is new in the methodology and what are the consequences for the
teaching material required? Does this lead to changes in the teaching methods which are reflected in the textbooks and supplementary teaching material that we produce?

It was decided to postpone the topic of ICT, Internet and Smart Boards and their relationship to teaching and learning methods to the next meeting. This also makes more sense because the issue of Learning Objects is directly related to this topic.

Other suggested topics for the coming meeting of this network were:

1) The problem of copying CD-ROMs, i.e. which strategies are in use in the member companies?

2) Integration of different subjects into interdisciplinary material

3) Learning objects

4) Didactic communication (how is the knowledge we want to teach the pupils transformed in a didactic way – and are there methods for this which are better than others?)

Hasselager, 8 May 2007
Preben Späth