CIDREE Expert meeting, Tartu, August 28th – 29th, 2014

Digital learning materials in science and mathematics for basic education

Participants: experts in science education, learning materials and ICT from OPH (Finland), ENS de Lyon (France), OFI (Hungary), The Norwegian Centre for ICT Education, Education Scotland (UK), UT (Estonia), Estonian Ministry of Education and Research, Information Technology Foundation for Estonia, Estonian Physical Society.

The main topics presented and discussed during the expert meeting were:

1. The policies of each country represented, concerning designing and use of digital learning materials.
2. Actual conditions in schools, teachers' and students' attitudes on using digital learning – overviews of results from recent investigations.
3. Pedagogical, technical and organizational aspects of creating and using digital textbooks and other learning materials.

On the first day the topics were presented by each participating country and discussed further.

In Norway and France development of digital learning materials has been a longer process. Scotland had developed a variety of materials in connection with the Curriculum for Excellence. For every country there is a problem how to find better balance in using traditional and digital materials. Estonia has legal obligations to prepare digital learning materials but several authors (incl. teachers) have already done it before on commercial basis. Now the cooperation with Finland is in progress. Hungary is relying also on the international cooperation and use of international materials.

The second round was dedicated to demonstrations of examples of digital materials in use and ideas about new digital textbooks. Each showed and commented some examples used in his/her country. Kaido Reivelt, senior researcher on didactics of physics at UT discussed the issues on the example of his current work on digital material of school physics – problems to solve, how to organize texts, video-clips, hyperlinks for the best usage of students and teachers; how users could organize their own study material on the proposed digital textbooks.

Between the discussion rounds a guided tour in Education Innovation Centre of Tartu University took place to demonstrate technology and equipment for the use of learning and teaching in digital environment.

On the second day the brainstorming on opportunities and obstacles in the field of digital learning was carried out.

Main conclusions:

1. Pedagogical categories:
   Why do teachers use/do not use digital learning materials?

- Provide continuous support to teachers (human technician)
- Teacher training to provide teachers with ICT knowledge and skills
- Market and advertise material to education stakeholders

- Teachers may be overloaded by the time commitment to use/learn/generate new digital learning materials
- Ensure that teacher trainers are competent and up-to-date in their ICT knowledge and skills
- Provide evidence-based research to justify the advantages of using digital resources
- Research the barriers preventing teachers from using ICT in the classroom

  How to quickly apply new devices in learning (e.g. smartphones)?
  - First, ensure that all students have access to these new devices
  - Provide examples and guidance to teachers for designing learning activities around these new devices

  2. Technical:
  How to ensure the sustainability of digital content?
- Allow flexibility in contracts for acquiring content so that the content can be sold/re-used by other companies when the expiration date of the content seems to be approaching

  3. Organizational:
  How to balance the commercial publishing industry needs with the sharing of open access resources?
  How to make it easy for stakeholders to find digital learning materials?
- Suggest common metadata fields so that learning materials can be efficiently searched for

The presentations are found:

http://www.curriculum.ut.ee/en/CIDREE-e-textbooks

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