

The different curriculum innovations from Finland for preparing our students for the twenty-first century

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I. BACKGROUND

This article is a collection of different approaches how to use new technology and social media to answer coming needs of modern society. The school is changing, the teaching is facing a new era, and the old paradigms of pedagogy are falling. Students and pupils are using more and more ICT-tools (smartphones, laptops) especially outside the school. In general, ICT- tools are used for different purposes in everyday and working life. The working and learning environments are complex and there is new dimension: virtual environment and augmented reality. Moreover, we have to find out how we could make visible and useful the formal, nonformal and informal learning. The new era demands to empower students to think critically, communicate widely and work collaboratively with new tools. Therefore, these changes in everyday and working life and, moreover in learning and working environments are forcing teachers to learn how to use ICT tools in teaching and learning.

Teachers' collaboration and learning is analysed in the context of a Finnish Viikki Teacher Training school located in the metropolitan area of Helsinki. This school consists of elementary school classes 1 – 6, lower secondary (middle school) classes 7-9 and upper-secondary (high school) classes 10-12. There are altogether 900 pupils and students and 100 teachers at the school. The school building is 10 years old and quite well equipped. The classrooms and teachers working rooms are located in small communities inside the building. All teachers are qualified teachers and they participate also to the mentoring of student teachers. An important characteristic of a school is research based development of the use of ICT in education and operations of the school. This development work is well directed and distributed. Almost all teachers participate the activities. The author of this chapter is chemistry teacher and, therefore, most of the examples are in the context of science education. However, the ideas could be applied in the teaching of several school subjects.

II. CREATING THE TWENTY-FIRST CENTURY SKILLS BY USING SOCIAL MEDIA TOOLS

It is widely accepted that four C:s; **Collaboration, Communication, Critical thinking** and reasoning and **Creative** thinking and problem solving; are among the most essential twenty-first century skills. In this article I handle collaboration and communication mainly when I talking about **blog pedagogy and wiki**

pedagogy. Of course these skills are also in an important role in other functions but to focus on something I choose this approach.

Critical thinking and reasoning is a crucial skill. We are living in the information world where we are choking with data and we have problems to find the real and accurate information for our use. With this we also have another kind of problem. Only fraction of research papers are published and fewer of them are shared. For teachers and especially for those who use research based approaches, this situation is alarming. If we are concern about critical thinking and reasoning, there is a question about do we have tools to make that possible to pupils and students.

Creative problem solving is a part the inquiry based learning. Some might call it problem based learning, but it is not only that. In my science teaching there is always at least one choice to make: do you use **theoretical approach or experimental approach.** Sometimes the concepts are important or the process is invisible to human eyes, so you need tools (language) to understand what is happening. But always you can make a hypotheses and try to prove it or collect data to create a better view or theory what was happening in a test tube (or somewhere else).

New technology and new thinking about assessment brings new tools to teaching and studying (and learning). We talk about **creating conceptual knowledge** and different ways to support this process. Now we can use new tools like CmapTools (tool for concept map creation) and FreeMind or Mind Manager (tools for mind map creation). In the flood of information it is important to have a skill to make connection between different concepts and find out what is relevant what is not. (Attachment 1, Example 1)

All these new tools for studying needs **technology and information literacy** skills. It is not just reading and writing any more. Ability to use hyperlink navigation to jump to other www-pages or multimedia (video, photos, animations, 3d-models) content means that the environment is non-linear. Texts and material is not arranged and meant to be read in certain order. Kress said, that "There is no pre-given, no clearly discernible reading path, either of the home page or of each individual page, or of the site as a whole" (Kress, 2005). And Kress continues: "There are revealing changes in vocabulary: for instance, from write (and read) to design; from reader to visitor, from page and/or text to message-entity; and others no doubt. And there are

equally revealing changes in the principles of representation and organization: from the densely printed (relatively) mono-modal page to the multimodal screen and the new pages; from the conventions of page production to the mode of layout; from writing as dominant to image as dominant." (Kress, 2005).

III. VIIKKI APPROACH: Research and inquiry based perspective to the working and learning

In Finland the use of ICT – Information and communication technology – in teaching and learning has been emphasized since 1994 curriculum. There was a strong recommendation to use "information technology" as an aid in instruction when the curriculum is interpreted at the local level. The teachers were encouraged to make the fullest possible use of "information technology" in teaching any subject. After 20 years we are writing the second version after the 1994 curriculum. However, it is still challenging to engage teacher to plan their lesson in order to emphasize the use of ICT with pupils and students and how to use it in a pedagogically relevant and reasoned way in daily practice? Research-based teacher education and the teaching profession challenge teacher educators to stay at the forefront of work practices, experimentation and development alike. We have some research how much Finnish teachers use ICT, Sipilä (2014) for example have studied teachers from the basic education. Sipilä writes: "This study gives indications that half of teachers consider themselves to be both unqualified and unprepared to use ICT in education in a way that would add value to teaching and learning" (Sipilä 2014. p. 237). To put this result upside down, a half of teachers consider themselves qualified or prepared to use ICT.

So the teacher's role on taking ICT as a part of learning is crucial. You can find several technological gadgets, social media services for teaching and studying. To find real use and pedagogical reasoning to take those as a part of your daily work needs **a process and a holistic view** and **new kind of teacher education** (pre-service and in-service). In our school we have a strong research – inquiry based perspective to our work. New gadgets or services comes mainly through a development project as a part of large process. In-service training is crucial part of the process. Earlier we had IT-person and a pedagogical support person (a teacher with a little compensation for the time spent in these tasks). Understanding and research of the process (the diffusion of innovations) is based on views of Rogers and Fullan. And **new model of teacher's in-service**

training (Norssiope.fi) is based on these ideas (Muhonen & Myllyviita, 2014). All innovations rise from the teachers will to change his/her teaching traditions or models. They are based on teachers own level of subject knowledge. Teacher´s in-service training should be focused on creating new levels of the subject knowledge (technical – or ICT-based technical subject knowledge). The diffusion of new innovations is according to Rogers’ (1995) innovation theory “a communication process in which the speed of the process depends on, for example, the possibilities offered by the operational environment, the actors’ motivation and the features of the innovation itself. Teachers’ notions of learning and supporting pupils’ learning processes affect the usefulness and functionality of the innovation. The compatibility and complexity of the innovation, in turn, limit the progress of the process.” (Muhonen & Myllyviita, 2014) The modern idea behind this Norssiope.fi –training were to make teachers create a project of their own, change their earlier working methods giving them new ICT-tools or –programs. One result among others was that teachers felt htat this project improved the participants’ ICT competences. At the same time their attitude to the ICT changes to more positive direction.

The next picture shows all the issues to be notified when planning the change.

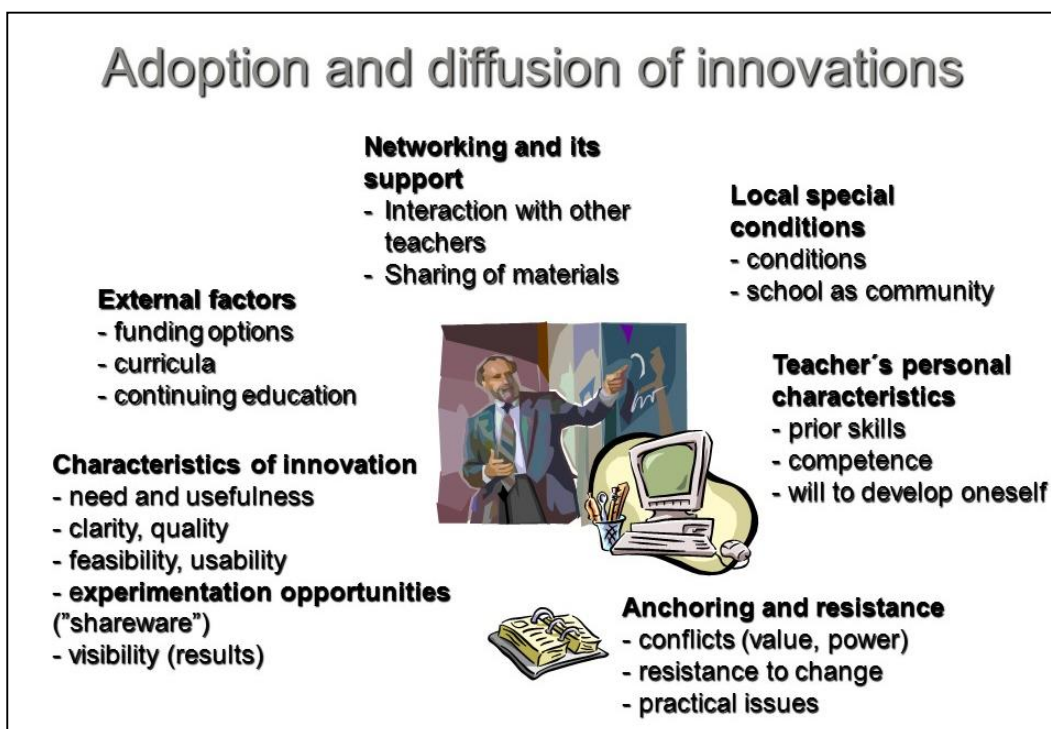


Figure 1: Adoption and diffusion of innovations (Myllyviita & Uusikartano, 2005, adapted from Fullan (1991) & Rogers (1995)).

To point out some of crucial issues mentioned in the figure:

- networking (the project is common for more teachers) and supporting networking (school's leadership is supporting via giving resources and creating new structures of activity)
- idea of sharing materials (social media tools make this easier)
- teacher's personal willingness to develop oneself (contextualized project to support learning), focusing concrete and practical issues
- special funding by Finnish National Board of Education and Ministry of Education (ICT-policy at the national level)

IV. BLOG PEDAGOGY

Weblog or just blog –concept was launched by Jorn Barger (1997) already at year 1997, so the tool is over fifteen years old. It is a question about simple web-page – nowadays blogs are created through special blog service like WordPress or Blogger. Blogist tells his opinions and taught via articles – or post as they called them – on chronically order. New communication technology allow the use of online (synchronize) or asynchronize type of interaction between peer students and between students and teachers. This make possible – called **blog pedagogy** – reflection between peers and between students and teacher. Also for assessment you fund new tools. Basically you can use blogs as:

- **as a diary**, where writer tells about his experiences, happenings to the public, in my teaching practice like a course diary with authentic photos from the lessons and outcomes are for several purposes: some snapshots for absent pupils and students, repetition of ideas and happenings from the lesson, teacher's own reflection of the lesson
- **as a web journal**, for example delivering news and information for certain target groups, place where you are sharing your thoughts and outputs
- **as a pamphlet**, where the idea is to create discussion about actual themes and issues
- **as a portfolio**, where blogist shows his artifacts, products and ideas under certain topic;
- **as a reflection tool**, where blogs has tools for making comments – that is one basic idea of blogs; there is opportunity to give feedback (or feed forward as I like to say); reflection can happened also

in a closed blog (blogs are open only to certain persons, or possibility to comment belongs only to registered persons and so on)

- **as a discussion forum**, where idea is to keep discussion going on about certain topic (hobby, politics, ...)
- **as a tool for knowledge creation and delivering and a tool for assessment and evaluation**
- **as documentation tool** – materials and output should be uploaded to services (cloud services, blog services) and they will be archived; documents can include different kind of materials like texts, videos, photos or animations, from novels to concept maps or from poems to abstract graphics
- **as a organizer**, where web community gather around certain topic to discuss and to plan future actions. See more ¹

The most important idea about blogs is the opportunity to make readers interaction possible. They can comment and give their point of views to the discussed matter. Chang and Chang (2014) have studied how blogs can be used in higher education in encouraging interactions between students, for example the reflection process during and after lessons held by student teachers.

If you compare blogs and wikis, the main difference is: blog texts are for comments and wikis are more for collaboration, creating texts together. In wiki all are participants (not audience or just readers).

Important features in blogs are among others possibility to use feeds (RSS, e-mail notifications), large enough space for pictures and even for videos to have an archive for dealing those and an easy to remember www-address. The world of blogs is also called as a blogosphere, which give picture of the own culture and community of bloggers and blogs. It means that it is a virtual world as a part of creating concrete actions and view of the physical world.

What makes this all to be called a **new pedagogical approach**? First of all, this is (point 1) teacher's own **reflection after** the lesson. We practice this during the teacher education and this is one useful way to

¹ Bennett, W. L., & Segerberg, A. (2012). *The logic of connective action: Digital media and the personalization of contentious politics*. *Information Communication and Society*, 15(5), 739–768. doi: 10.1080/1369118X.2012.670661 [Taylor & Francis Online] or Gerbaudo, P. (2012). *Tweets and the streets: Social media and contemporary activism*. London: Pluto.

continue it. Writing 5-10 minutes and downloading photos is enough. When you combine reflection and documentation you have a powerful tools to develop your teaching and pupils learning. (Attachment 2, Example 2)

Secondly (point 2) especially when it is question about artifact (material, immaterial), which needs a process, you can **create a documentation** all the phases and the final artifact. There is a possibility to reflect these phases or the collections of final artefacts (like **portfolio**). It is about to make your artifact visible to your future employers, probably show your way to work and to create (and to be creative). In Finnish school we have opportunity to use a specific tools this – <http://www.kyvvyt.fi>. A blog could partly do the same tasks, but this service is designed for portfolios, making a certain kind of portfolio for different purpose. One example is Art course. (Attachment 3, Example 3)

Thirdly (point 3) blogs are useful in the school-home communication or should I say in **interaction** between homes and the school and creating **transparence** to daily lives in the school. In our elementary school blogs are commonly used in this way. Parents get more information from pupils daily toil through photos and videos placed on the blogs. Parents get also opportunity to make comments or questions. The old “reissuvihko” (finnish, meaning kind of pupil’s notebook for home work and parental information) have got an electronic substitute, web-based tool. The class blog is also for delivering information to parents and at he same time giving opportunity to make comments or ask questions about theme or issue mentioned in the blog page. In the high school here you use virtual learning environments like Edmodo, Yammer, Moodle or Edu2.0.

If and when teaching and learning (learning – teaching – studying) is happening in a formal, nonformal and informal environment, blogs are there and they are powerful tools. Roughly you can categorize these three areas:

- 1) a formal: teacher gives you a task to build a blog, to use it as a portfolio; to make readable for teacher and perhaps to other students (for peer review) or even to own parents; blog can work as an official channel between the school and parents (homes).

- 2) a nonformal: they support your studies outside the school; blogs support home tasks and give more learning opportunities
- 3) an informal: using blogs creates new ways to express yourself and take part to your hobbies (and networks); blogs connect all.

V WIKIPEDAGOGY

The knowledge creation in a group (a virtual group), supporting collaboration, and sharing knowledge as a peer are crucial ideas behind wikipedagogy. Wiki is an excellent tool for collaboration, not only between your own students and pupils but also between others from other school and communities. It is borderless and not dependent of time and space.

Basic useful ways to use wikis are:

- as a **own “Wikipedia”**; students **are creating** their **own learning materials** (in their own language) and **sharing** their knowledge
- as a **documentation tool**; who is “doing” is also creating the content (decentralize content creation)
- as a **group writing tool**; the writing process is done together, always in real time and with the latest version of article
- as a **joint archive**; it can be open or closed just for members (Attachment 4, Example 4)

The knowledge creation is a part of modern pedagogy. It is not enough, students need some scaffolding, some support. Wikis are great **tools** for that. Another important point is, we are dealing with the idea of sharing each other’s knowledge with common tool.

All modern wiki platforms (like www.wikispaces.com) gives opportunities to construct a real learning environments with discussion areas, calendars, notifications, embedded videos and archives.

VI. HOW STUDENTS ARE PREPARED FOR NEW TECHNOLOFY AND NEW SKILLS

Preparing students to use new technologies is done with

- 1) testing their skill levels
- 2) arranging focused extra courses in ICT; how to use learning platforms, cloud services, special programs (like Excel)
- 3) creating a peer support network; we arrange a special ICT-supporter course for 1-year student who are acting as ICT-supporters for newcomers next year

As a part of normal subject courses there is some lessons dealing with special program, like in chemistry:

Avogadro, ChemSketch, ChemSense Animator.

VIII. REFERENCES

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Example 2

Name for the practice: Teacher's blog supporting learning/teaching and teacher's own reflection

Summary: During certain courses I keep teacher's blog for students. Those who are absent can focus better on lesson's issues, for the others the blog collect ideas risen during discussions. Sometimes with photos, useful links and summaries. The blog makes possible to reflect teacher's own actions and helps to improve lessons for next courses.

Description:

Photo of the blog (right). There is an article from every lesson, sometimes with photo, like here.

Use and application:

Teacher's blog is used like a diary of lessons. It gives a modern way to student, who were absent from the class, get some ideas and topics from the discussion risen during the lesson. It is also a short repetition for the others.

It gives a possibility to give some authentic images (photos, stories, slogans) from the lesson.

For teacher this kind of use of blog (pedagogy) gives opportunity for quick reflection on the lesson (made immediately or quite soon after the lesson). This working style gives a good base for further development of the lesson and/or for the way to handle current topic. Sometimes you find new ideas for next lessons.

Needed resources: WordPress –program (own web site) or any kind of blog-service, used by web browser.



The screenshot shows a chemistry blog page. At the top, there is a search bar and a navigation menu with 'ETUSIVU' and 'KEMIAN OPETUS VIIKISSÄ JA TVT - 21.8.2014'. The main article is titled 'Daniellin kennoa, lyijyakkua, korroosion estoa, KI:n elektrolyysi ja veden hajotusta - 5.9.2014' and is dated '12 days ago' by 'admin'. The article text describes a practical experiment involving a Daniell cell and corrosion prevention. A photograph of the experimental setup is included, showing two test tubes in a rack, one containing a pink solution. To the right of the article, there is a section for 'Viimeisimmät artikkelit' listing recent posts and an 'Arkistot' section with a search bar.

Example 3

Name for the practice: The Art blog (course blog) to support students' own reflection

Summary: During certain courses students keep their own blogs. The blog makes possible to document the process and give to the others to see and perhaps comment the process and the result.

Description:



Photo of the blog. Documentation of the process with photos.

NAAMIOITA

Rakennamme kaupunkitaideteoksen Viikin norssin edustalle Tilanhoitajankaarelle Taiteiden Yöksi ja Juhlaviikoille. Teemanamme ovat tunteet: ILO, TYYNEYS, ÄRTYMYS, VIHA, SURU JA KAIPAUS.
<http://www.helsinginjuhlaviikot.fi/fi/taiteiden-yo/ohjelma/1361>

perjantai 26. elokuuta 2011

Perjantaina aamusta alkaen ripustettiin. Hieno sää! Ja kaikki saatiin aikeiseksi hyvissä ajoin.



Lukijat

[Liity tähän sivustoon](#)
Google-käyttäjäraati

Ei vielä yhtään jäsentä.
[Ole ensimmäinen!](#)

Oletko jo jäsen? [Kirjaudu sisään](#)

Blogiarkisto

▼ 2011 (13)

- ▶ syyskuu (1)
- ▼ elokuu (12)

[Avajaisia - kuvat Tytti Suhonen 9b](#)

A V A J A I S E T

Perjantaina aamusta alkaen ripustettiin. Hieno sää...

NAAMIOITA-KAUPUNKITAIDEOKSEN AVAJAISET PIDETÄÄN P...

Torstaina tehtiin teoksen mainosta koulun sisälle...

9.luokkalaisten kuvaavat naamioitaan näin:

[Lisää hienoja naamioita 9.-luokkalaisilta ja kiinn...](#)

Tänään ruokatunnilla Helmi teki laminoiteja ja ki...

8.luokkalaisten kuviryhmä teki upeita naamioita!

<!--StartFragment--> RYHMÄ VIIKIN NORSSIN LUOKIO...

Tässä on kuvia suunnittelustamme ja jo muutamia na...

Needed resources: WordPress –program (own web site) or any kind of blog-service, used by web browser.

Example 4

Name for the practice: Wiki as an archive

Summary: Collection of high school chemistry materials. Everybody can use and deliver their materials.

Description:

Photo of the the wiki. Here is a collection of questions and answers to matriculation test in chemistry.

The screenshot shows the 'Lukion kemian wiki' interface. The main content area displays a table of matriculation test materials, organized by year and season. The table has three columns: 'vuosi tehtävät' (year tasks), 'pisteitykset' (graded tests), and 'huomioita' (notes). Each row contains a PDF icon, a filename, a 'Details' link, a 'Download' link, and the file size.

vuosi tehtävät	pisteitykset	huomioita
2014 syksy KEMIA_syksy14_kysymykset.pdf Details Download 1 MB	Kemia_pisteitysohjeet_syksy2014.docx.pdf Details Download 747 KB	
2014 kevät KEM_YO_K2014.pdf Details Download 1 MB	Kevaan_2014_Kemian_pisteitys_2014031... Details Download 334 KB	
2013 syksy KEMIA_syksy13_kysymykset.pdf Details Download 1 MB	Kemian_pisteitysohje_syksy_2013.pdf Details Download 479 KB	
2013 kevät kemia_yo_kevät13.pdf Details Download 624 KB	KEM_Pisteitys_kevät2013.pdf Details Download 238 KB	
2012 syksy kemia.pdf Details Download 1 MB	KEM_YO_syksy_2012_FINAL_2109.pdf Details Download 237 KB	
2012 kevät kemia_yo_kysymykset_k2012.pdf Details Download 473 KB	KEM_YO_K2012.pdf Details Download 212 KB	
2011 syksy kemia_yo_kysymykset_s2011.pdf Details Download 831 KB	Kemian_pisteitys_syksy_2011_v2.pdf Details Download 198 KB	
2011 kevät kemia_yo_kysymykset_k2011.pdf Details Download 825 KB	KEM_K_2011.pdf Details Download 181 KB	
2010 syksy kemia_yo_kysymykset_s2010.pdf Details Download 310 KB	Kemia syksy 230910_korj.pdf Details Download 608 KB	
2010 kevät kemia_yo_kysymykset_k2010.pdf Details Download 896 KB	KEM_Pisteitys_k_2010.pdf Details Download 613 KB	

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Use and application: Finnish high school students do matriculation tests and also some of them do it in chemistry. The page in the photo shows materials just for preparing students to this big test. This wiki-service (Wikispaces) gives possibility to collect any kind of files (embedded photos, videos, pdf-files) to this archive. It is not a basic feature for wikis. This kind of wikis can be used also as a student's own electronic notebook.

Needed resources: web browser.