The Paducation project involved teachers representing a variety of disciplines from two upper-secondary schools in Germany and Sweden. The teachers used iPad on a daily basis to explore and evaluate the possibilities and challenges that this technology could bring to their profession.

The use of iPad was discussed in relation to different knowledge cultures and subject traditions. Collaborative work within and between the two groups took place offline in workshops and online through a mutual blog.

This report describes different aspects of the project and the process that unfolded including eight articles written by project participants. The report also presents some over-reaching outcomes from the project as well as some critical thoughts.

The findings are a compelling read for anyone engaged in teaching or teacher education providing practical know-how and should be read in relation to the on-going digitalization of education.
An EU-based method-advancement project by German and Swedish teachers working with iPad

Edited by Michael Forsman

Södertörns högskola
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1. Introduction

Michael Forsman

This working paper from Södertörn University entails a report about an EU-based method-advancement project for teachers working with iPad. The aim of the Paducation project was to support a group of teachers to use iPad as a pedagogical device in their daily work in order to explore and evaluate the possibilities and problems that the IPad-technology can bring to the teacher profession.

The Paducation project has been financed by the EU-fund for the “Lifelong Learning Programme” (LLP) under guidance from the EU-branch for Education and Training. One dimension of the LLP-programme that ran between 2007 and 2013 (it continues from 2014 to 2020 within the Erasmus+ programme) was to stimulate learning experiences and development of education and training across Europe. This has been done by financing exchanges, study visits, and networking activities. One group to consider in this context was of course teachers working together in cross-national projects. For example projects concerning changing conditions of teaching following the ongoing digitalization of the educational system.

The Paducation project ran from the fall of 2013 to the summer of 2015. It has engaged ten Swedish and ten German teachers. The Swedish group came from Rudbeck High School (henceforth Rudbeck) which is an upper secondary school (gymnasium) situated in the municipality of Sollentuna in the northern region of the wider Stockholm area. The German group came from


Georg-Christoph-Lichtenberg-Schule (henceforth Lichtenberg) in Kassel in the Kassel/North Hesse region. Lichtenberg is a gymnasium (high school) but it also includes lower level compulsory school. Including the project managers and external observers almost twenty-five people have been engaged in the project.

In the application to EU (from 2012) three objectives were mentioned as being the basis for the project and for the partnership between Rudbeck and Lichtenberg.

- Bridging the gap of the digital divide between teachers and their students and their different pre-understandings and experiences of digital devices in teaching.
- Teacher training and competence enhancement by using iPad (a product and trademark from Apple) in the daily pedagogical work and not least the visual possibilities that this touch-screen and app-based technique for online connection has to offer.
- Changing ways of teaching in a collaborative manner by comparing teaching and grading systems in Sweden and Germany, and through continuous exchange and collaboration between the two groups, online and offline.
- Research the benefits that teaching with iPad can bring.

Framing the project

One important background to the application for the Paducation-project was one-to-one ventures (abbreviated as 1:1) that within the context of education refer to a technological and pedagogical model where each student and teacher gets one digital device each. Typically 1:1 refers to laptops or tablet computers (such as an iPad). A shift to 1:1 includes not only new devices but also a transition to a netbased and interactive learning environment. When the Paducation project began neither of the two schools involved had gone over to 1:1 (Rudbeck shifted to 1:1 in the fall of 2014). Therefore the focus from the start was on teacher’s profession and teachers’ learning processes, not the
students, this is an important distinction to have in mind when reading this report.

When the project started all the teachers involved received an iPad together with some initial instructions. Beside this they had to build up their own competence mainly by personal trial and error (a lot of this taking place during their free time) and through mutual exchange and collaboration within the project framework and its groups. In relation to the above mentioned the following three questions can be said to encapsulate what became the central themes of the project.

1. In what ways can iPad be used in preparation, realisation and evaluation of different sequences of teaching in a variety of school subjects?
2. How can practical know how and good practices be exchanged, disseminated and developed in a collaborative manner in order to reinforce innovative, reflective and excellent teaching?
3. Which are the preconditions, benefits and drawbacks when using iPad (technologically, professionally, personally)?

Question number one is mainly addressed and answered by the articles presented in chapter 4–11 where teachers that were involved in the project describe and discuss their different experiences and ways of working with iPad within their own discipline. Question number two is answered by the project as a whole and by how it was organized, this is primarily described in chapter 2. Question number three is mainly answered in chapter 3 with the help of the material produced through the evaluation process.

These questions and their answers reflect the Paducation project and also the content of this report. The report should to be seen as a documentation of the project as well as a platform for continuous work, both for the persons and the schools that were involved, as well as for other teachers. Another main addressee
for this report is students and educators within Teacher Education.

Together the twenty teachers that were involved in the Padu-
cation project represented a great variety of school subjects: German, Swedish, English, History, Politics, Mathematics, Biology, Music, Arts, Media etc. This wide scope made it possible to discuss iPad in relation to different subject traditions and knowledge cultures as well as exploring ways to create common ground and mutual sharing points – and this report has a lot to offer in terms of practical know-how. For example there are a lot of suggestions for “useful apps” and scenarios for how to organize iPad-based learning.

During the project period four workshops, each of them two days long, were organized. One important aspect of these workshops was the so called Show ’n’ Tell-sessions where the teachers showed and shared apps, net-solutions and learning scenarios. Another key point in the project was the working group sessions where the teachers met in smaller groups to work with their iPads and share their practical knowledge from using iPad in their teaching. In addition to this every teacher had meetings with their project partner meaning a colleague from the other country working with the same or a similar school subject.

Another important aspect of the project were continuous on-
line contact on the project-web platform where the participants had the opportunity to share practical advices learning scenarios and write entries on the project blog. These entries covered every-
thing from useful apps to more principal questions concerning teaching and the role of the teacher.

Three project managers guided the project, all of them well experienced both as teachers and from long-time work with media production and organizing. The project also included two researchers; one media researcher from Södertörns University in Stockholm, and one educational researcher from the University of Kassel. Together they were commissioned to follow and eval-
uate certain aspects of the project. They took part in the work-
shops, followed the project online, and did focus group interviews. Their main intention was not to do regular research but to support the project members in their reflections about the relation between the iPad and their professional development.

Outline of the report

Based on the background given here the report has the following ambition.

- To describe the design of the Paducation project and how the exchange programme and collaborative set up was organized in order to stimulate explorative and cross-national work with the iPad.
- To voice the experiences made within the project by offering eight original articles written by teachers involved in the project.
- To summarize some findings from the observational work done by the two researchers.
- To present some critical thoughts concerning the shift to 1:1.
- To give some advice for future work with 1:1 pedagogics and iPad-technology, not least in relation to the context of teacher education.

In what now follows you will encounter articles written by the project members, i.e. the teachers, researchers, project managers. The first entry concerns the organization of the project as such. Here the project managers Ted Weisberg (SWE) Angelika Jae- nicke and Nicole Mahlke-Harms (GER) give an extended background to the project and its design. They also share some of their learning outcomes from the project, and their thoughts on how to organize collaborative learning amongst teachers from different countries.

Then follows an article written by one of the two researchers that followed the project, Michael Forsman who is an associate
professor in media studies and also engaged in teacher education at the School of Culture and Education at Södertörn University in Stockholm has followed the Paducation-project together with Oliver Emde, a doctoral student at the Department for Didaktik der politischen Bildung at Kassel University and long time youth worker. Forsman describes the explorative and collaborative design of their evaluation work and brings forward some empirical material and results. The article also summarizes some of the major findings from the project.

Then we enter the heartland of the report, with eight original articles written by teachers who were involved in the project.¹ This part of the report starts with an article by Nicole Mahlke-Harms (Maths, Chemistry, Swedish) and Eva Lorenzana (Arts, Biology) from Lichtenberg. They describe three cases where they have used different visual options that the iPad technology offer and argue that by using visual and creative methods you can make otherwise abstract matters relevant and engaging for the students.

Ulrika Molin teaches English and also Swedish for immigrants at Rudbeck. She writes about her transformation from being an iPad immigrant to becoming comfortable with using her iPad on an every day basis. She also emphasizes some of the many advantages that she has found when using iPad, not at least in relation to immigrant students with substantial limitations in their abilities in Swedish and from working with students with different cognitive (dis)abilities.

Gabriel Hund-Göschel teaches Religion, Politics, and Economics at Lichtenberg and describes how apps can be used for visualizations, for example for making mind maps or concept maps that can help the students organize and develop their knowledge.

¹ Michael Forsman has revised and formatted the material from an editorial viewpoint. Ted Weisberg has made grammatical corrections. All images used in this report have been taken within the framework of the project and the members of the project have approved of the use of these in the report.
Ylva Sanner teaches Art and Media at Rudbeck. She is also very positive about iPad and apps like Sketchbook or Inkpad, two apps designated for artistic work with digital means. Otherwise she argues that the iPad must be understood in relation to online services such as Google Drive that allows users to store and share files “in the cloud” as well as editing documents, spreadsheets, drawings or presentational materials. Sanner also describes her experiences from working with her project partner Martin Fiola who teaches Arts, Media and Politics at Lichtenberg. Together they had their classes exchange and comment on each others pictures online during a joint project about Identity.

Pernilla Hammarström teaches History and Swedish and describes how she and a colleague at Rudbeck used iPad, iTunes U and an app called iBook in a tailor-made collaborative online course in Swedish 2. Their course dealt with the history of literature, grammar and argumentation and their online material included professional film clips, newspaper articles and excerpts from books. The course also included that the students used their still newly received iPad to create material to share online.

Anna Oldner Bengtsson teaches Swedish, Rhetoric and Media at Rudbeck. In the fall of 2013 she decided to stop using textbooks in her rhetoric course. Instead she built her whole course on iPad-related concepts. One part of this was that the students were requested to use the built-in video camera in their iPad to document themselves while giving speeches. They also shared these videos online. All of this was done in order to make the students more reflective about their personal performance in order to improve it. Based on some more theoretical outlines Oldner then argues that iPad is best used in pedagogics that advocate “formative learning”.

Lena Norée teaches Swedish and English at Rudbeck. At the beginning of the project she was somewhat reluctant to iPad. Not least due to the risk of a decrease in concentration and an increase of disciplinary problems in class; as students become absorbed by their iPad and different online distractions (gaming,
social media etc.). After two years in the Paducation project Norée is much more positive about iPad and uses it for writing assignments in class and for commenting and grading.

The last article in this section of the report comes from Andreas Heuer. He writes about his experience from using iPad in his History classes (Heuer also teaches French and Philosophy) and discusses different ways to make history become more relevant to students in a globalized, diverse and differentiated network society where immigration and ethnicity contributes to a new complexity. The question Heuer asks is how iPad and other Internet-related technologies can be used to open up the classrooms for diversity and a plural of “histories”.

Then in the final article Forsman and project manager Ted Weisberg summarizes the main outcomes of the project in relation to its original aims and questions. They end by giving some advice about iPad use in relation to Teacher Education.
2. Paducation project design, realisation and deductions

Ted Weisberg, Angelika Jaenicke & Nicole Mahlke-Harms

This chapter describes the background and the build-up of the Paducation project and how it has been organized, as well as its different components (workshops, blogs, etc.). This will lead up to some conclusions concerning how to best organize this kind of project. We also comment how to go about to implement new technology in a structure meant for collegial self-learning, in a process involving teachers from two schools, in this case also from two countries.

Background to the project

One immediate background to the Paducation project was the application to EU program Comenius Regio, a context already commented on in the introduction, but there is also a longer history of exchange and mutual interest between Rudbeck, the Media Project Center Open Channel and the Media Authority in Hesse and Lichtenberg to take into account. This long lasting contact between these partners deserves to be described in some detail here since it is part of the explanation to why the Paducation-project came out so well for the two schools involved.

“Open Channels for Europe” was the title of the 4th annual meeting of Open Channels. In November 1997 the German association of Open Channels invited representatives of community media from all over the world to Berlin. Ted Weisberg was among the guests. Weisberg was teaching media in Rudbeck
and his students were in a program for media education including internships. On the sidelines of the meeting in Berlin we agreed on a future liaison. Already the next spring Ted Weisberg organized so that eight of his students could come to an internship at the Open Channels in Kassel, Gießen, Offenbach/Frankfurt and Fulda. These internships lasted several weeks and were also part of their final exam. The students internships was financed by the EU-fund LEONARDO which was a programme for transnational placement for young people in initial vocational training.

This “test run” in 1998 came out very well and the exchange became a tradition. Young Swedes came to Kassel and stayed in the families of Lichtenberg-students but from 2002 the placements of students were only at the Open Channel in Kassel and the cooperation shifted more into a student exchange with the Georg-Christoph-Lichtenberg School. Students from Lichtenberg came to Sollentuna for intensive three-week video courses, staying in the families of the Swedish media students.

In 2007 we began to look for ways to develop our cooperation with the Regional Media Authority (LPR) in Hesse. Heaps of e-mails were exchanged and a first meeting took place on the sidelines of the international local-TV-festival in Košice in Slovakia. There were conference calls via Skype and at the end we had a plan. We initiated an ambitious project together with a Community Radio station in Aberdeen Scotland within the framework of the Transition of Innovation category of the EU Lifelong Learning Programme (WORK-TV – Internet Broadcasting for European Youth). The intention of this project was to develop methods for training young people in Germany, Great Britain, Ireland and Sweden for future careers in television production. The application was submitted in Sweden but failed. A second application also failed.

Then “The Media Program” was removed as a program for vocational training, as a consequence of a fundamental reformation of the Swedish school system at large. For Rudbeck this
blocked the possibilities to continue with the student exchange with Lichtenberg but the three old partners Rudbeck, Lichtenberg Schule and Open Channel did not give up the idea of continuous collaboration. The two teachers Ted Weisberg and Andreas Rehner decided that teacher training could be an area to develop for a new exchange program. Around this time there were only a few tablets around in each of the two schools and no efficient or elaborated pedagogical concepts on how to use the tablets in classrooms. Ted and Andreas made some inquiries and found that all over Europe there were small start-up projects with tablets as well as some more advanced pilot projects for teaching with iPad (a product that Apple launched in 2010).

Around 2010 Rudbeck already had a comparatively progressive orientation towards using information and communication technologies (ICT) in their general pedagogic work, and Lichtenberg was quite early out with testing iPad in the German context. Both schools started to seriously explore the use of iPad around 2011. This soon led to the idea to create a collaborative project for method advancement for teachers interested in developing digital pedagogics.

Here the EU-program COMENIUS-Regio for lifelong learning seemed like a source that could support a renewed and revised exchange program, this time with teachers in the center.1 The EU-program COMENIUS-Regio was structured as a program for bilateral partnerships between two local or regional authorities with a role in school education. The idea with this fund was to support projects with a potential to develop an innovative approach for sharing best practice in the continuous professional development of teachers at local, regional and international community level. Part of the conditions was that the application had to involve at least one school and “one other organisation” situated in the region or municipality (like a museum, youth club, NGO, association, training institute, library or

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local company etc.). (In 2013 the COMENIUS-Regio program was incorporated in the Erasmus+ program.) \(^2\)

![Image](image.png)

**Pic. 1. Funding for Paducation came from the EU program COMENIUS-Regio**

During a two-day working session in Kassel the work on a joint application started and the project title Paducation came up. Paducation of course alliterates to Education; education with iPad. Then it turned out that it was not that hard to attract the interest of the institution responsible for teacher training in Hesse. The plan came to implement the results of the project into the future plan for teacher training and school development in both countries.

Cross-national cooperation always entails a lot of work, not least with filling out the demanding applications that the EU-office requires. We had application-texts going back and forth for comments and many changes were done in the last minute. The application was ready in 2012 but then we were unable to get the final signature from the German side in time and we lost the chance to apply. Since we had spent so many hours putting the application together we decided (after a mourning period) to turn in a revised application the following year. Then after five years of determinant work and with our previous exchange as a fundament, our cross-national cooperation finally paid off and we were approved to start the Paducation project in 2013.

The Partnership

The Hessian Media Authority (regulatory authority for commercial broadcasting, LPR Hesse) signed a cooperation agreement with the office for teacher education already in 2011. Their main objectives were concentrated on the education of active teachers, teachers-in-training, and teachers and instructors within teacher education. To certify the links to teacher education we decided to get in contact with one university offering teacher education in each country.

Regarding “the other organization” it came naturally that it was to be The Regional Media Authority in Hesse (LPR) since there already was a long-term relationship and LPR is not only a producer of local audiovisual and multimedia material but also works with media literacy. Beside action-oriented practice in schools and other youth institutions LPR Hesse work with media and media literacy training for educational facilitators.

Pic. 2. The five organizations involved in the Paducation project.
About the schools
At the core of the project were of course the two schools Georg-Christoph-Lichtenberg-Schule (Lichtenberg) and Rudbeck High School (Rudbeck) therefore some facts about the two schools are in place here.

Georg-Christoph-Lichtenberg Schule
The Georg-Christoph-Lichtenberg Schule is a gymnasium (high school) but also includes lower level compulsory school. Lichtenberg Schule is situated in Kassel which is a town in the Kassel/Northern Hesse region (the whole region has around 200 000 inhabitants). The Lichtenberg Schule has around 1 300 students and 120 employees. Lichtenberg is a school with special opportunities and competence in media education, mathematics, computer science and the arts. The school is providing expert teacher training and delivers an experimental environment for developing new tools in education.

For many years Lichtenberg have had a reputation of being a modern and media oriented school with several pilot projects in the field of media literacy. The school was also early out in testing and enhancing the educational possibilities of tablet computers, while building an ecosystem for contemporary educational purposes. These ideas were strongly promoted by the computer science/media teacher Andreas Rehner, who later went on to work in a similar manner for the German School in Madrid.

Rudbeck High School
Rudbeck is an upper secondary school in the municipality of Sollentuna, one of 26 municipalities in the county of Stockholm, with 65 000 inhabitants. Rudbeck is the only public high school in the municipality and has approximately 2 000 students and around 220 employees.

Rudbeck’s profile is to offer the students the chance to choose and influence their own curriculum and the school is one of the
top picks among teenagers in the entire Stockholm County. Rudbeck offers many different courses and these can be combined individually. Rudbeck also works a lot with formative assessment (BFL).

Sollentuna has the ambition to be an ICT-intense area generally, with an emphasis on education. Since 2010 the school authority in Sollentuna has initiated and pushed forward 1:1 solutions with the ambition that most schools in the municipality should be 1:1 schools in a near future. Rudbeck, being a forerunner in this area, still had to wait until the fall of 2014 before becoming transformed into a 1:1 learning environment.

The teachers and the team

The first task we had to fulfill when we got the message from EU that the application had been approved was to find and select the teachers that were to take part in the project. The funding from EU would cover a maximum of 10 teachers from each school. So how were we supposed to pick them out if the interest exceeded the number of seats?

Lichtenberg composed a group of teachers from different sectors and school subjects. Rudbeck went out with a general invitation for interested teachers to attend an informative presentation regarding Paducation. In both schools the ambition was to get as mixed groups as possible both in relation to teaching subjects and digital competence. Still Rudbeck wanted as much as possible to match the variety of subjects already established in the German group. At Rudbeck the headmaster would not allow a reduction of teaching hours or any other kinds of compensation for those participating in Paducation. Due to this restriction several prospective teachers backed out. This confirms the thesis that those who chose to join the Paducation project had a strong commitment to explore new ways of working.

The management group for Paducation was already established when the application was handed in. Two of the managers (Ted and Angelika) knew each other well from the long period
with students from Rudbeck coming to visit the Open Channel.³ Angelika was joined as project manager by one of the ten teachers in the German group, Nicole Mahlke-Harms, who came in when Andreas Rehnér left to Spain. This was very helpful, not least since Nicole is fluent in Swedish.

Already in the application it was stated that Södertörn University and Kassel University would provide one researcher each for a limited commission, to follow and evaluate the project. These two became Michael Forsman, Phd. and Associate Professor in Media and Communication Studies, School of Culture and Education, Södertörn University; and Oliver Emde, doctorate, and scientific collaborator in ”der Didaktik der politischen Bildung” at the university in Kassel. In addition to this one teacher from the German team Thomas Maxara was willing to set up a web page and a project blog for the members to use for continuous comments, reflections and exchange of work. During the project period one member left the Swedish group due to other responsibilities and was replaced. The entire project has engaged 10 teachers from each school (including Ted and Nicole).

Below is a list of the project members 2013–2015 and their position and teaching subject.

³ Ted was working with the Media program at Rudbeck, and had a background as a filmmaker and producer in the context of the Stockholm Open Channel (local tv for associations). Angelika was/is the executive director for the Open Channels in Hesse.
As you can see the teachers in the group came from many different disciplines, although with some emphasis on the humanities.
and social science rather than on natural science or technology. The fact that there has been an orientation towards language, media, and arts among the project members has probably had some effect on the selection of apps and the themes for the learning scenarios etc.

The formation of the project

So how can you organize a project for collaborative learning and exchange with 20 teachers working with different subjects and who mainly are engaged in the project during their free time? Even though net-based technology was at the heart of the Paducation project we could appreciate the importance of meeting physically. Therefore we had workshops every six months, with the groups coming to visit each other.

The Workshops

Four workshops were held during the project period. There were two seminars in Kassel and two at Rudbeck. Already from the start we had settled on having some permanent points in our schedule. One of these were the Show n’ Tell-sessions. The term signifies a particular format of public presentation where you briefly (5–10 minutes) show your audience something and tell them about it. In our case the focus was mainly on demonstrating a certain app and how it can be used for teaching or presentations of so called Mobile Learning Scenarios. A Mobile Learning Scenario is a framework for presenting positive results in the project to more easily enable integration into the school curriculum. A third re-occurring point was to arrange collaborative exchange in smaller groups, as well as to give time for dialogue between the project partners teaching the same or a similar subject. Beside this we knew from before that it is of vital importance to also allow time for informal contact and some common activities such as visits to a museum. Since we regard our way of formatting the project as one of the explanations to why the
project came out so well we would like to describe somewhat more in detail what took place during the four seminars.

**Workshop I: Lichtenberg, 29–30 October 2013**

Preparation for the first workshop began with the visit to Sollentuna by the German project managers Angelika Jaenicke and Nicole Malke-Harms in September 2013. They met the newly selected Paducation teachers as well as two members of the Swedish steering committee. Together with the Swedish project manager Ted Weisberg they then discussed many ideas and reached an agreement on a structure for the upcoming workshop that were to take place in Kassel in October 2013.

The first workshop began at the Open Channel TV-station with the project managers introducing the goals for Paducation, where we were at the moment and where did we want to be in two years. The representatives from the Regional Media Authority LPR and the Public Education Authority for the county and city of Kassel then officially welcomed the members of the project. Then the members got to meet their project partner and some examples of pedagogic uses of the iPad were shown.

Already at the onset of this project it became apparent that social relations were an important part of cross-national cooperation. Our first lunch together set the tone for how involved and intense conversation can become when a positive environment was provided for.

After returning to the Open Channel office, the Paducation web-based project platform was introduced. This site would provide general information about the goals of our project as well as information regarding the participating organizations. It would also be the platform for our communication within the project. Thomas Maxara who created the home page guided us through the site, and we were able to register ourselves and learned how to use the platform and blog. The Swedes were then welcomed to the Lichtenberg Schule and invited to a German style barbeque dinner.
Despite all the earlier planning there had to be some improvising when the headmaster suddenly insisted that the German teachers hold their classes the next morning instead of continuing with the planned programme in the workshop. The decision was made to allow the Swedish group to attend their project partners’ lesson. Being able to look into on-going classes in a different country was an impressive experience for the Swedish group. To directly observe both the differences and similarities between the two educational systems confirmed the concept of added value when participating in a European project. Common goals were agreed upon and commitments to certain tasks were made, such as implementing iPad in the classroom and describing the results in a blog. The changing role for teachers was to be a theme to follow for the coming two years.

The visit to Kassel was crowned with a walk from the famous Hercules monument down through the World Heritage Bergpark Wilhelmshöhe. Here we were guided on a Photo Safari where everyone documented the surroundings with their iPad.

Pic. 3. iPad to document the views Kassel October 2013

Workshop II: Rudbeck, 28 March 2014
Due to a labor strike with Lufthansa we had to adjust the 2nd workshop to only one day in Sweden. This created a very intensive program and certain activities needed to be cut. Rudbeck’s
new headmaster Per Frithiofson attended the opening and addressed the group. Then we had an extensive “Show n’ Tell” session and this was filmed and later made available on the Rudbeck homepage. Several members of both groups made presentations and showed what they considered as good examples of what they had accomplished since the first workshop. We reviewed the use of blogs for communication within the project and encouraged all members to increase their engagement. The Swedish group took their German colleagues around on a tour of Rudbeck.

Andreas Rehner who attended from Spain presented a lecture called “iPad and the impact on teaching and learning”. Here he demonstrated various available apps with an emphasis on those applicable for natural sciences. This was also filmed and made available for all teachers at Rudbeck and Lichtenberg as well as for other interested viewers. Peter Sandberg and Anna Older Bengtsson from Rudbeck gave a talk on “Assessment for learning” which is a method that had been emphasized at Rudbeck recently. There was consensus about the use of iPad fitting very well into this context. Michael Forsman from Södertörn University introduced thoughts regarding the evaluation work he and Oliver Emde were preparing.

The day ended with the revelation that the headmaster at Rudbeck had decided that iPad would be the digital device to be used for Rudbeck’s upcoming transition to a 1:1 learning environment. This breaking news was met with cheering and applause from the entire group. We realized that our Paducation project had been one factor in helping to bring about such a decision. We also realized that there would be an enormous challenge ahead for us in the upcoming school year.

Workshop III: Lichtenberg, 2–3 October 2014
The program kicked off with a speech by the new headmaster at Lichtenberg Klaus Riedel who showed a much more positive and understanding attitude towards our project than his predecessor.
The project managers presented summaries of the progress made in both schools. Lichtenberg had begun to use Mobile Learning Scenarios and Rudbeck had completed equipping teachers and students with iPad. The Paducation work would now have a profound shift in developing new learning and teaching processes.

Project partner tours were arranged so that subject specific groups could see certain classes and sections of Lichtenberg. Several Show n’ Tell-sessions were done in smaller groups, instead of in a plenum session. Both researchers had their own track, planning focus group interviews and the final questionnaire. The project managers dealt with finding a date for the last workshop as well as planning a structure for the final seminar.

After lunch the different work groups presented what they had learned from each other. They especially focused on tools like Google Drive and apps like Explain Everything and iTunes U. These groups went back to work one more time before discussing what they had achieved, difficulties and what they felt was missing. The first day concluded with a presentation of various initiatives from the EU Commission to enhance digitalization of classrooms in Europe including websites Open Education Europa, Digital Agenda 2020 and Open Discovery Space.
The second day began at the Open Channel. Volunteers at the station filmed the proceedings. Our guest speaker was Andreas Hofmann who, besides being a teacher, also is IT-manager and Media Coordinator for schools in the Lower Saxony region. Hofmann has been working with 1:1 projects using iPads in schools for over two years as part of a nationwide project called Mobile Learning-21. His message was that the change in teaching and learning that the iPad brings inevitably goes hand in hand with the need to also change all work processes. He related examples how students help train fellow students to use different apps effectively. However the economic reality in German education is that it is the students’ own families who need to agree to pay for leasing an iPad. This is a major difference between the two countries, since the local politicians in Sollentuna granted extra funding to Rudbeck to make the shift to 1:1.

The workshop ended with the researchers presenting some results from their first survey. They also defined some project objectives and assigned the upcoming deadlines for the report to follow. The group got a home assignment that included blogging about “critical incidents”, “professional dilemmas” or a “major change”. The researchers went on to introduce an outline for the final report and met with respective national project group to plan and discuss upcoming focus group interviews. After the lunch break a former employee of the Open Channel group gave the group a guided theme tour of Documenta (the international exhibition of modern and contemporary art occurring every five years in Kassel). Again our social activities definitely helped strengthen the work climate in the group. We met one last time to summarize the workshop and there was unanimity on the following points:

- Everyone had learned a lot
- The many hours in small groups were useful
- Cooperation now works better
• The workshop was a great step forward in gaining perspectives on the work we were doing and understanding more the role of the evaluation as another goal in the project’s sustainability.

Workshop IV: Rudbeck 23–24 April 2015

All the responsible institutions for upper secondary education in Sollentuna were represented when welcoming the participants to the final Paducation workshop: The Sollentuna School Authority, the Education and Labor Market Board as well as the headmaster of Rudbeck. It is important that this type of developmental project stays in touch and has support from city officials, politicians and the school management. That was also why our workshop began in the City Hall. We even had one principal from the Lichtenberg School in attendance, Eckhard Müller. His participation was an indication of the growing interest from the school management at Lichtenberg to seriously explore the value of 1:1 learning environments for their education. Nicole Mahlke-Harms confirmed this interest when reporting from the “Pädagogischer Tag”. This event was initiated by the German half of the Paducation group and came to involve the entire faculty.

An entire day was set aside to discuss the use of iPad in teaching and learning. Involved students who began to help their peers were being called “digital heroes”. A similar development had occurred at Rudbeck, for example some students had developed an app by students for students called “ETER 1:1 at Rudbeck”. Ted Weisberg demonstrated this application to the workshop, showing how basic information for using iPad was structured in an easily accessible manner. Pernilla Hammarström presented how far Rudbeck had come in using iTunes U (c.f. ch 8). It felt like our quest of searching for tools to revamp our way of teaching with the help of iPad had been successful. Pernilla also showed how she and a colleague had created their own teaching material by using the app iBook.
Educational strategist Kristina Björn was the next speaker in the workshop and she gave a personal reflection on her own development of working with digitalized education, which had led her to understand the advantages of using iPad. She quoted some statistics saying that Apple products are present in 75% of the Swedish schools, with four iPads to every Mac computer. Kristina Björn also talked about the teacher as a leader in contrast to being boss. She presented a tool called *Technological Pedagogical Content Knowledge (TPACK)* which is a framework to understand and describe the kinds of knowledge needed by a teacher for effective pedagogical practice in a technology enhanced learning environment. Her presentation was filmed as well as the entire opening of the workshop. This was made available on the Rudbeck home page.

We then took a scenic walk to the Edsvik Art Gallery to have lunch and to look at the student exhibition “Identity” which included works done with iPad. A final group photo was taken at the Rudbeck Vevax statue symbolizing the “driveshaft of knowledge”.

*Pic. 5. Final workshop with the Paducation-group*
We continued with an intensive Show n’ Tell-sessions in interdisciplinary groups. Then Anna Oldner Bengtsson guided us through the concept of Challenged based learning, which also was a basic theme in the Paducation project as a whole. We then summarized the day’s activities and had a final dinner on the boat Patricia docked by Lake Mälaren in Stockholm.

The second day began with visits to on-going lessons at Rudbeck. We then discussed the observations made and concluded that 1:1 had firmly begun. We continued with a dialogue regarding the sustainability of Paducation. Finally the following plans to end the project were made. First to present the project at a conference in Kassel in June 2015; secondly, to arrange a seminar with Sollentuna kommun and Södertörn University in the fall of 2015; thirdly to make general distribution of the final report to all participants, partnership organizations and others via the Paducation web as well as through Södertörns distribution channels. A German translation of the final report was also mentioned.

After lunch Michael Forsman and Oliver Emde presented some data from their focus groups interviews and handed out their second and final questionnaire to the participants. An outline of the evaluation report was presented and there was a discussion about how teachers in the group could contribute with short essays about their experiences from the project.

The headmaster at Lichtenberg, Klaus Riedel appeared in a humorous video message and a Declaration of Intent was presented to the group. The purpose of this was to reaffirm that both Lichtenberg and Rudbeck would be committed to encourage a continued cooperation. This intention was taken by acclamation and signed by representatives of both schools.

Then there was a closing ceremony whereupon two circles were made so that everyone could say something individually to everyone involved. Emotions were strong as we all bid farewell for now.
The Blog

The idea of keeping a blog came up early and already during the first six months of the project several entries were uploaded. The pace of entries from the fall of 2013 to spring of 2015 was somewhat uneven and not surprisingly you could notice some extra activity in and around the time of the workshops. To be honest the blog did not come off as being as heavily trafficked as we had hoped for but still many entries were published. Many of them concerned apps and sharing of good advice or just reflections about a newly tried concept for a lesson with iPad.

I also got bad conscience today when the e-mail from Ted arrived in my mailbox. My goal of this project is to feel comfortable using the iPad in the classroom. To tell you the short version I just say that I want the students to use it for filming, writing, presenting and searching information.

In Kassel I learned about many apps that could be used for having a bit more fun than what’s possible with an ordinary computer. Before Kassel I was not so sure about using the iPad instead

Answerphone messages created with Garage Band

Hey, today’s strike gives me the chance to upload something I found out about this week. In my year 7 English class we were talking about answerphone messages last week. Just in time I found out about a feature of the app “Garage Band” which makes it possible to add effects to recorded voices - a telephone effect is one of it.

The kids had a good time recording it. I chose the example below because of the wonderful
of the computer but all the presentations of what can be done conscience them that this is the devise of the future and we must learn how to use it otherwise we will be looked upon as ancient teachers. I want to be modern. After Kassel I have used the iPad for filming my student’s speeches and having them make trailers in iMovie to get to know each other and give a presentation of themselves in the new group that I have just started.

See you all soon,
Jakob

Fig. 2 From the Paducation blog, December 2013

Fig. 3. From the Paducation blog, November 2014

Mobile learning scenarios

During 2014 the idea of using Mobile Learning Scenarios (MLS) to register and share iPad-based scenarios for class came up (thanks Nicole!). The idea of using mobile learning scenarios came from a ComeniusRegio project called “Mobile Learning” (a project aiming to develop, implement, evaluate and disseminate scenarios for the use of mobile technology for teaching and learning). The MLS concept was imported to the Paducation project and transposed into a format with some headlines and holding points: title, subject, level, description of the assignment and its performance, planned learning outcomes, level of preparation and realization. The role of the iPad was then included in the closing section containing reflections on the opportunities and challenges that the concept contained.
Conclusions

During the fourth and final workshop we had a short appraisal of the project. Everybody confirmed their learning outcomes and a feeling of a new level of security in handling the iPad was apparent. All involved also asserted how happy they were that they had been a part of the Paducation project, and when asked about what they saw as the foremost explanation for the positive outcome of the exchange it was the workshops with its Show n’ Tell-sessions that came up. Being able to interact informally was also stressed as a positive factor. The participants also appreciated the possibility to meet with one’s project partner to discuss matters directly related to the didactics of one’s teaching subject. The problems that were mentioned had more to do with what went
on beside the project in the ordinary work zone, where you hardly ever have the time and space to experiment with the iPad and different learning scenarios. The importance of routine contact and regular meetings, also within the respective groups of both two countries, was also mentioned.

Another aspect of the positive outcome for us as project-managers was that the two schools had a pre-history of exchange. This was really an advantage when we started Paduca-tion. We can also see that the strict format that was kept throughout the project was beneficial; with the Show n’ Tell-sessions as a permanent post, as well as having scheduled time where the project partners could interact. The fact that many had apps and the use of the mobile learning scenarios to share online made the blog and on-going online contact meaningful. The fact that we had a “built in” evaluation system thanks to the two researchers and their interventions and activities was also something that contributed to the success. All of this we see as part of our formula for a prosperous project of this kind. In hindsight we should maybe have allowed even more time for the meetings in smaller groups and for dialogues between the project partners. We can also see that we maybe did not spend enough time on more critical reflections in relation to iPad and 1:1 ventures.
3. The pros and cons of iPad: the evaluation process and its results

Michael Forsman

In this chapter the evaluation-process of the project is summarized together with some of the main findings. (Due to practical reasons Forsman has written the chapter but the results are based on collaborative work between Forsman and Emde.) We also make some preliminary links between our findings and other more extensive studies about 1:1 ventures. It is once again important to stress that the German and the Swedish group had very different technological preconditions. The technological level and ambition at Rudbeck was quite high already from the start of the project. While almost the opposite was the case in Lichtenberg (c.f. Ch. 2) even though Lichtenberg had a very good technical level compared to other German schools. This has of course colored the process and the results.

The main question that this chapter addresses out of the three questions presented in the introduction is *Which are the preconditions, benefits and drawbacks when using iPad (technologically, professionally, personally)?* We approach this question with a compilation of data produced from questionnaires and focus group interviews. The model we chiseled out was unique for this project but we have also glanced at previous research about 1:1, mainly taken from Sweden.
Some previous findings

Swedish pedagogue Tomas Kroksmark (2013:61) has shown that 1:1 can be observed on different levels and questions asked if 1:1 replaces faulty and inefficient ways of working with more efficient ways (time saving, self organized work, scale advantages etc.). Or if 1:1 modifies and redefines the way that teaching is conducted and formatted, how assignments are given, and the what kind of knowledge that is considered as important and legitimate.

Tallvid (2015:125) has also followed several efforts with 1.1 and concludes: “The results showed evidence that ICT is frequently used in teaching and challenges the existing classroom practice, but also that fundamental elements of teaching and learning have remained largely untouched. These findings run counter to expectations of change in teaching methods due to the technology investments”.

The changes that do occur are most likely to take place on the micro level in the classroom framed by the interaction between teachers and students but Kentsdotter Persson & Kroksmark (2013) argue that a certain fixation with technology comes with 1:1 and that present data show that tablets can be experienced as “time-thieves” due to technological problems and the time investment needed from each teachers to learn how to use it. Although generally the teachers experience 1:1 as something very positive, and a majority feel that the students become more engaged. Even though the possibility to reach the postulated goals do not seem to be substantially effected by a shift to 1:1.

Grönlund (2014) stresses that for a 1:1-venture to be successful it should not be regarded as an ICT-project where “new technology” is incorporated in order to solve old problems. Grönlund argue that the important thing is that 1:1 is implemented as a long term and decisive effort meant to change the way that teaching is organized and conducted, and also how the school works in general. Thus 1:1 should be about changing perceptions and ideas among the ones involved (teachers, students, parents,
administration, authorities) and the main concern (for the principal) should be to arrange learning that helps develop the teachers “digital literacy” by sharing (for example by creating a local bank with digital pedagogical resources).

As you will notice the data presented below is to a large degree in accordance with what this previous research has shown.

Some methodological considerations

Before we go into the results in relation to the overarching question of pros and cons, circumstances and the differences between before and after iPad, a few words must be said about the perspective and methodology we used.

We did the evaluation work without any ambitions to make theoretical advancement. Nor did we have the prerequisites for extensive or elaborated empirical research, and we did no classroom observations or individual interviews with the teachers in the project. Otherwise these methods are often used in studies of implementation of new educational technology (ICT, gaming etc.) in schools (Lantz-Andersson 2009). Often it is the students learning that is in focus (Arnseth et.al 2013) also when the teacher profession is debated (see Lantz-Andersson & Säljö 2014).

Our focus has instead been fully on the teachers and our role is best described as observers in an evaluation process, without ambitions to value or judge outcomes or qualities of the project, nor to measure the level of or progression in the teacher’s ability to use their iPad professionally. Rather we tried to develop a model that could support a process of reflective self-evaluation among the teachers. Early on it was decided that at least one of us would take part in each of the four workshops. We also decided to do focus group interviews and to use very basic questionnaires: one handed out in the beginning and one at the end of the project. In addition to this we did some observations during the workshops and followed what the group members posted on the webpage and the blog. Later we decided to invite the
teachers to contribute to the final report with their personal reflections (see chapter 4–11).

Questionnaire
After some initial contacts with the project management and around the time of the first workshop in Kassel in October 2013 we constructed a basic questionnaire mainly containing questions about access to digital devices at work and at home, profile and habits as media user, and estimations of personal competence in handling digitals professionally. (We got 8 answers from the Swedish group and 9 from the German group.) Some of these questions re-appeared in the second questionnaire that we distributed during the fourth and final workshop at Rudbeck in April 2014; although the second questionnaire included more open-ended questions. (We got 7 answers from the Swedish group and 10 from the German group). Thus the two questionnaires were not identical and not meant to determine similarities or differences between the beginning and end of the project. They should rather be seen as complementary.

Focus groups
The other methodological route we choose was to do focus group interviews in the Swedish and German group respectively. Two focus groups interviews were made “on each side”. The main thing with focused conversation is that they give you data from a group that discusses a certain topic (Barbour 2007, Stuart et. al 2007). When you do focus group-interviews the ambition is not to generalize, nor to make psychological conclusions about the individual member’s. Instead it is how the participants filter their reality through the intersubjectivity of the group that is in focus. In this case the teachers talking about their experiences from using iPad in their schools and in relation to the Paducation project.

We designed an interview guide for both countries. As things turned out the German interview guide had a little bit more
detailed questions while the interviews done at Rudbeck had a more semi-structured character (see Appendix) but in principle the same themes were covered in both countries.

The super themes
A couple of almost unavoidable “super themes” influenced both the questionnaires and the focus groups. These concerned “The pros and cons of using iPad” and “My job before and after iPad”. What we also could notice was what Gitlin (2000) called “the double bind of teaching” meaning that teachers feel obliged to be both “researchers” and developers of new methods and at the same time must be efficient and present in their daily work with students. We could also notice something that we here have called “the dual mode of being a teacher”. By this we mean that teachers tend to understand and value their own actions and motives in relation to the signs of learning they get from their students: our questions concerned the teacher’s perspective on their own profession, but many of the answers we got had to do with the teachers perception of the students (re)actions.

About the results
What we bring forward in this chapter is qualitative data from the teachers involved. It is their descriptions, opinions and reflections we present. We have arranged these answers thematically and by combining material from the questionnaire and the focus groups. It is once again important to bear in mind that Rudbeck was better equipped with digital technology from the start and also went into 1:1 during the project period.

Access and abilities
One factor behind how well the teachers valued their abilities to use digital technology has to do with their access to digital technology and their previous know-how. Therefore the first questionnaire included some questions about digital standards, both in office and privately. Almost all the respondents said that they
were frequent users of digital tools in their teaching (lap top, power point etc.). To send e-mails, go online to search for material etc. was something natural to do on a daily basis for everybody, although almost half of the respondents (8 of 17) had to share a computer with a colleague in their office. Privately all the project members had their personal smart phones and computers and almost everybody had mobile Internet access. More than half of the respondents (9 out of 17) had a private iPad already when the project started.

When asked to estimate the level of their professional digital skill (when using computers and mobiles) all except for one answered “Very good” or “Good enough”. One person deviated from this by describing the personal skill as “Inferior”. In the second questionnaire even more respondents classified themselves as “Very good” and no one picked “Inferior”. It is reasonable to see this as a sign of a feeling of personal advancement in handling digital technology due to the use of iPad and the Paducation project.

Motivation to enter the project

One way to interpret these answers is that most of the teachers already had a personal interest in using digital technology professionally. Maybe you could even call them “early adopters” (c.f. Rogers 1962/2005) at least in relation to their own work setting. In the first questionnaire we also asked for the three main motives for applying to the Paducation-project. The two top ranked alternatives were “I want to develop as a teacher” and “I want to created new situations for learning for the students”. These were followed by “I want to engage the students more in the lessons” and “I want the students to learn from each other.” However, no one marked the alternative “I want to improve my career opportunities” (although being part of the Paducation project very well could be an argument in a wage negotiation). One conclusion from this is that the teachers that entered Paducation had a strong personal interest to develop as a teacher.
3. THE PROS AND CONS OF iPAD

The pros and cons of iPad-technology

We asked about the main advantages and disadvantages when using iPad as a teacher, and here many of the answers we received were related to “the dual mode of the teacher”. The two “most popular” alternatives were: “Using iPad increases the student’s motivation” and “The students are able to comprehend more information”. Whereas “It makes my teaching more efficient” or “I can work more paperless” did not rank very high. Here it is interesting that the teachers in the German group choose the same main alternatives as their Swedish colleagues although Lichtenberg were far from 1:1. It is also interesting that the Swedish respondents showed the same pattern as in the German answers, both before and after Rudbeck made the shift to 1:1. Once again, one possible explanation to this could be that being (an engaged) teacher is about having “the dual mode” and generally being more committed to your students learning than to your own personal convenience.

When asked about the main disadvantages or problems following the use of iPad two alternatives dominated: ”The students get involved in other activities (gaming, surfing etc.)” plus “There are technical problems”. In the second questionnaire the questions about advantages and disadvantages instead were formulated in an open-ended fashion, and this gave us a wider spectra of answers. Below you can see a compilation of some keywords that are meant to summarize what came up as advantages respectively disadvantages when using iPad.

Only three in the Swedish group and no one in the German group top-ranked the alternative “iPad is a good tool in helping students with (cognitive or physical) disability”. No one chose the alternative “iPad is a good tool for students with language problems” Another thing worth commenting on is the contradiction we can see in the figure below between “Engagement” and “Distraction”. As you can see you get both. This means that iPad can stimulate some student’s (and teachers) interest and at the same time be a distraction to other student’s (and teachers).
Similar answers came up in the questionnaire as in the focus groups considering the pros and cons of iPad technology. It should be stated that our questions about advantages and disadvantages may have occurred as a bit unclear to the respondents since they both could be interpreted as referring to the teachers experience (which was what we actually wanted to know about) and the student’s results.

<table>
<thead>
<tr>
<th>Ipad technology</th>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>−Time saving</td>
<td>−Stress, frustration and bad atmosphere due to technological hassle</td>
</tr>
<tr>
<td></td>
<td>−Quick, Instant</td>
<td>−Storage problem on the servers</td>
</tr>
<tr>
<td></td>
<td>−The mobility</td>
<td>-Hard to transfer some data between different units and platforms</td>
</tr>
<tr>
<td></td>
<td>−Easier to start up lessons and assignments</td>
<td>−Problems with Google Drive</td>
</tr>
<tr>
<td></td>
<td>−You don’t have to use paper</td>
<td>−Confusion when there are different domains</td>
</tr>
<tr>
<td></td>
<td>−Creative</td>
<td>−Difficulties with keeping an updated network</td>
</tr>
<tr>
<td></td>
<td>−Good for presentations and documentation</td>
<td>−Bugs and flaws in iDrive and Google Drive</td>
</tr>
<tr>
<td></td>
<td>−You can connect your classroom to “the world”</td>
<td>−A lot of potential distractions</td>
</tr>
<tr>
<td></td>
<td>−You get new interactive possibilities</td>
<td>−Technology tends to come more in focus than content</td>
</tr>
<tr>
<td></td>
<td>−There are options for individual variation</td>
<td>−The leadership rewards use of iPad and new Apps, not good teaching</td>
</tr>
<tr>
<td></td>
<td>−You can reach different materials, and sources instantly</td>
<td>−The school leadership might hide their incompetence behind grandiose ventures with new technology</td>
</tr>
<tr>
<td></td>
<td>−Unlimited options</td>
<td>−Students come with uncharged iPads</td>
</tr>
<tr>
<td></td>
<td>−You can make visualisations that were impossible to do before</td>
<td>−Students come with uncharged iPads</td>
</tr>
<tr>
<td></td>
<td>−You can change and develop the content of a lesson</td>
<td>−Technology tends to come more in focus than content</td>
</tr>
<tr>
<td></td>
<td>−You can link to diagrams, photographs, audio- and videofiles with maps, e.g. from different epochs in history</td>
<td>−The leadership rewards use of iPad and new Apps, not good teaching</td>
</tr>
<tr>
<td></td>
<td>−Students can find different sources online</td>
<td>−The school leadership might hide their incompetence behind grandiose ventures with new technology</td>
</tr>
</tbody>
</table>
– Students have overloaded and “dirty” iPads where the students keep too much material
– Students enter the wrong networks
– Documents disappear when students don’t remember on which platform they dropped them
– The winners are the ones “in the middle” whereas low achievers lose, and the traditional high achievers were better of before

As you can see time saving, efficiency and increased mobility and flexibility are among the major things for the teacher together with increased engagement among the students. The number one negative factor seems to be technological problems. The number one thing mentioned and described in detail in the focus group interviews had also to do with the gains in efficiency that iPad brings. We also asked the participants if there were any areas where they preferred their laptop or home computer to their iPad. The one area that stood out was: “Typing and writing longer documents”. Nor did the iPad rank very high as “a tool for more complex things” such as visual editing and sound editing. Many also preferred “my ordinary computer” to do presentations, administrative work, printing, evaluation and comments on student’s work, exams and assignments. There were comments on the smallness of the screen when working with moving images or texts.

Before and after iPad

One particular dimension of the pros and cons of iPad was the transition from an analogue and paper based production circuit to a digital file based system.
Before iPad                                       After iPad

− A lot of paper
− Making copies for the class
− You have to plan every lesson well
− You used to run around
− You were stiff standing by the white board
− When they had mobiles you did not know what they were doing
− Students always “forgot” their papers and exams

− Less paper
− Going online or projecting
− Start with the perspectives of the students
− Now you can have everything with you
− Now you can move around in the classroom
− It is easier to check the screen of the iPad
− Students don’t forget to bring their iPad

As we can see the time saving aspects comes up again, together with new options for student engagement. It is also interesting to note the argument that iPad makes it easier to keep the concentration, focus and discipline in the classroom.

**Engagement**

Our mapping of pros and cons can be broken down to several sub-themes, for example how iPad affect the students participation and involvement and your own engagement as a teacher is one of them.

**Pros**                                    **Cons**

− It is more fun to be a teacher now
− You can pick up on things that the students bring up
− You can shift direction in an ongoing lesson when things come up: Ok then, let’s find out more about Pussy Riot!
− You can give unprepared assignments for online search in

− It is harder to engage the students in “slow learning” or reading.
− Students expect you to entertain and engage them in their own learning
class: “Who was Rosa Park?”
− Students can use their previous knowledge and you can pick up on their references “Have you seen this”
− Students are more motivated and engaged and they really want to use their iPad
− The students are empowered and confirmed when they can see their own results and process
− Weak, silent, or shy students get a chance
− The Students becomes responsible for their own learning
− Students perform better
− Students improve their study techniques
− Students are more satisfied

There were several testimonies (in the focus groups) about how the iPad culture has made the teacher job more fun and instantly rewarding. At the same time a new role for the teacher evolves, the teacher as coach and entertainer.

Presentations and documentation

As can be noticed below in the section about apps some of the major apps are used for presentation and documentation. That was also the two areas that the teachers mentioned most. As you can see there were no real negative aspects of how to use iPad and the network for presentations, neither when you do it as a teacher nor when your students present material and assignments.
Presentations and documentation

<table>
<thead>
<tr>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td>– It is easy to do photo-documentation</td>
<td>– You must have 100% concentration</td>
</tr>
<tr>
<td>– You can document the students work during lessons</td>
<td>– You must always come up with new ideas</td>
</tr>
<tr>
<td>– You can go through things afterward</td>
<td>– You have to be entertaining</td>
</tr>
<tr>
<td>– You can follow group discussions online</td>
<td>– iPad time must be meaningful time</td>
</tr>
<tr>
<td>– Students perform better</td>
<td>– Students expect you to be available 24–7</td>
</tr>
<tr>
<td>– Students do more engaged presentations and enjoy their work more</td>
<td>– Students expect your to be updated about the latest apps</td>
</tr>
</tbody>
</table>

Communication and feedback

With iPad aligned to the networks of the school a lot of possibilities opens up for communication and feedback, but this new structure also has its drawbacks.

Communication and feedback

<table>
<thead>
<tr>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td>– More communication and dialogue on how to go about</td>
<td>– You must have 100% concentration</td>
</tr>
<tr>
<td>– iPad boost collaboration, participation, teamwork</td>
<td>– You must always come up with new ideas</td>
</tr>
<tr>
<td>– You can go through things and give instant feedback</td>
<td>– You have to be entertaining</td>
</tr>
<tr>
<td>– The teacher see students on Google Classroom and can give instant</td>
<td>– iPad time must be meaningful time</td>
</tr>
<tr>
<td>feed-back</td>
<td>– Students expect you to be available 24–7</td>
</tr>
<tr>
<td>– You can suggest extra material to extra engaged students</td>
<td>– Students expect your to be updated about the latest apps</td>
</tr>
</tbody>
</table>
Discipline and focus

One thing that can bother many teachers when 1:1 and different tablets come into the classroom is how to keep the focus on learning and uphold the focus and the discipline in the classroom when many students are online and thus in the two worlds of here and there, now and later; what American psychologist and MIT-researcher Sherry Turkle (2011) tried to seize with the concept “the tethered self”.

<table>
<thead>
<tr>
<th>Discipline</th>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>– Seldom disciplinary problems</td>
<td>– Sometimes you don’t know what they do when they ’work freely’ elsewhere</td>
</tr>
<tr>
<td></td>
<td>– The rowdy ones and the ones with concentration problems are calmer</td>
<td>– They surf around randomly</td>
</tr>
<tr>
<td></td>
<td></td>
<td>– They get immersed in YouTube</td>
</tr>
<tr>
<td></td>
<td></td>
<td>– New immigrants switch language and go on Skype to talk with friends in their country of origin</td>
</tr>
<tr>
<td></td>
<td></td>
<td>– Some go porn-surfing</td>
</tr>
</tbody>
</table>

Learning practices and main learning outcomes

When we asked the teachers how they had learned to use their iPad the two alternatives that most of the respondents choose were “Through personal trial and error” or “By asking colleagues”. In the German group there were more teachers that mentioned the Paducation-project and the workshops as being important to their learning process. Since the teacher group from Lichtenberg did not have the context of 1:1 they had to be more engaged in self-organized learning, where they helped each other out, which they, according to the focus group material, did both in “informal learning processes in the faculty room”, through “private consultation” with each other or “in Georg Cybercafé in Kassel”. For the Swedish teacher group the condi-
tions were different with special workshops arranged at Rudbeck and the daily work in an environment on its way to 1:1.

During the focus groups we asked the groups how they had learned to manage their iPad and what they had to suggest to others.

| How did you learn to use Ipad? | – From colleagues
|                              | – Not from students
|                              | – Within the project
| What were the conditions, pre-settings for this? | – Relevant technology in all classrooms
|                              | – BFL (formative assessment)
|                              | – You need a “battery guy” to help you out with the technology
|                              | – You need a media curriculum in your school
|                              | – Supportive management and principals
|                              | – Designated time
|                              | – In service-training
|                              | – Understanding and involved IT-service
|                              | – Differences between different topics and teams

When asked in the questionnaire about how they had learned to handle their iPad very few in both groups choose “Following instructions online”. This was a bit unexpected as previous research (in Sweden) have shown that teachers have to devote a lot of their free time in order to develop their digital skills (Grönlund 2014).

When we asked the groups about what they saw as the main learning outcomes after two years in the project the following came up.
3. THE PROS AND CONS OF iPad

<table>
<thead>
<tr>
<th>My main learning outcomes from the project</th>
<th>What I have missed in the project</th>
</tr>
</thead>
<tbody>
<tr>
<td>− I have better abilities and wider references now in:</td>
<td>− Enough time</td>
</tr>
<tr>
<td>− how to handle the iPad</td>
<td>− More about iTunes</td>
</tr>
<tr>
<td>− how to use the iPad pedagogically</td>
<td>− To develop everything</td>
</tr>
<tr>
<td>− giving direct response</td>
<td>− Professional training from certified Apple personnel</td>
</tr>
<tr>
<td>− finding solutions in a flux</td>
<td>− More qualified discussions about the reasons for using the iPad</td>
</tr>
<tr>
<td>− separating between situations when the iPad is useful/useless</td>
<td></td>
</tr>
<tr>
<td>− collaborative work</td>
<td></td>
</tr>
<tr>
<td>− non-traditional lesson planning</td>
<td></td>
</tr>
</tbody>
</table>

I have gained insights about:
− the many possibilities to do things differently
− the importance of reliable technique
− a re-definition of my role as a teacher
− that I do not have to be the expert all the time

What others can learn from Paducation

As already mentioned one important aspect of the Paducation project was to explore and share good practices. Therefore we decided to include an open ended question about this aspect in our second questionnaire so we asked: What would your main advice be to principals, schools and teachers planning to start using iPad or shifting to 1:1?

<table>
<thead>
<tr>
<th>Advice to principals and others</th>
</tr>
</thead>
<tbody>
<tr>
<td>− Make sure the teachers can gain enough competence</td>
</tr>
<tr>
<td>− Make sure the platforms and networks are in function</td>
</tr>
<tr>
<td>− Establish one central platform</td>
</tr>
<tr>
<td>− Avoid technical problems</td>
</tr>
</tbody>
</table>
– Stick to a long term plan for development
– Arrange proper and continuous workshops for the teachers already from the start
– Work in pairs and small groups
– Don’t rush it
– Make sure you meet regularly
– Make sure everybody can take part
– Take notice also of the skeptical ones
– Make space for creativity
– Just get going
– Implement mandatory training
– More formal training in using particular apps
– Get professional training from Apple
– Discuss the motives: Why do we use iPad?
– Don’t think that iPad can solve everything or replace all previous practices
– Learn from each other

As we can see there is again a strong emphasis on the importance of having well functioning technology but also on collaboration and an open and inclusive work climate. To have a well developed program for in service training with workshop is also something that is stressed by the teachers.

Some of the respondents, mainly from Rudbeck, also brought up what they considered as essential for a teacher to bear in mind when working in a 1:1 classroom.

<table>
<thead>
<tr>
<th>To bear in mind in the 1:1 classroom</th>
</tr>
</thead>
<tbody>
<tr>
<td>– Be open minded and playful in the classroom</td>
</tr>
<tr>
<td>– Let the students work in groups</td>
</tr>
<tr>
<td>– Synchronize iPads in the classroom</td>
</tr>
<tr>
<td>– Use trial and error</td>
</tr>
<tr>
<td>– Mix the serious and the fun to stimulate learning</td>
</tr>
<tr>
<td>– Stimulate creativity</td>
</tr>
<tr>
<td>– Develop models for peer-assessment</td>
</tr>
</tbody>
</table>
What Teacher Education can learn from Paducation

Another major idea behind the Paducation project was to explore iPad in a way that Teacher Education can profit from. Here we also used an open-ended question, where we asked for suggestions on how Teacher Education can go about in this area. Unfortunately many of the respondents did not answer this question, but we did get some advice from the Paducation group.

**Advice to Teacher Education**

- Make sure new technology becomes an integrated and given part in the program
- It is important that the teacher students get the chance to enhance their pedagogical competence
- Make use of available research
- Discuss what consequences iPad can have on different forms of exams
- Paducation shows the importance of working in partnership
- Paducation stand for the future of education in the 21th Century

We also asked what aspects the project members thought should be included in a curricula for iPad-training designed for teachers in other Upper Secondary Schools, or for educators and students within Teacher Education. Then the following came up.

**Checkpoints and goals for an iPad curricula**

- Mandatory courses in *iTunes U*
- Mandatory courses in file sharing
- Show n’ Tell session about apps like *Keynote* and *Pages*
- Courses in how to develop and use cloud services
- Be able to handle built in functions in the iPad such as the camera
- Be able to handle tools for sharing and publication
- Work with students about the implications of participatory culture
- Knowledge in how to handle different platforms such as *Google Classroom*
- Create links to theories about teaching
- Don’t build everything on 1:1
Apps, apps, apps

iPad technology is strongly associated with apps (applications) than can be downloaded and installed. Some apps are for free, others you buy through an App-store which is an online marketplace for apps. Apple and their third parties have over half a million apps to offer online (according to Wikipedia). A substantial number of these are designated for educational purposes such as presentations, multi- or mono-media production, storage, dissemination and sharing, commenting, monitoring, evaluation, administration, communication etc.

Already in the first questionnaire and when the project still was in its beginning we included questions about apps and the level of familiarity that the project members had with different apps. Everybody was already familiar with or had used *Keynote* (for presentations).1 Several had tried *Pages* (lay out) or *iMovie* (video editing). Still the project members had not really started to explore “the app world” yet. By the time of the final workshop, when the second questionnaire was handed out, all the participants had worked with iPad and apps for almost two years. So when we asked an open-ended question about apps we got lists with dozens of apps. Here are just a few examples. *iMovie* and *iStop* are two editing-apps. *Stop Motion* is an app for animation.2 We also found some differences between the German and the Swedish Group. For example *Good Reader* which is an app that helps you organize PDFs as part of research was more commonly used in the German than in the Swedish group.3 One app that there was some buzz around in the beginning of the project was *Book Creator*, which is an app that makes it pos-

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1 Learn how to use Apple’s Keynote for iPad in less than 3 minutes (Youtube), https://www.youtube.com/watch?v=7MT_GExNGos, download May 25 2015.

2 Creating Stop Motion videos With an iPad (Youtube), https://www.youtube.com/watch?v=2MaajG8jEYw, download May 25 2015.

sible to create your own books with the easy touchscreen technique offered by the iPad. As things turned out this did not become one of the major apps used in the project, instead iBook was the app that was used for “book production” (c.f. ch. 8).

As there are so many apps available it is interesting to notice that also in the second questionnaire Keynote and Pages still were the two “major apps”. This can probably be explained by the fact that presentations in Keynote (by students or teachers) and assignments formatted in Pages belong to the most frequent use of iPad. This correlates with the fact that the teachers said that their number one area for iPad use was to do rundowns and presentations (together with internet search). This may indicate that in spite of the multimodality and multi-literacy of the iPad it is not unusual that you are somewhat stuck in the idea of the book and typography as the main signification system for knowledge production (c.f. Kress 2010).

Conclusions and discussion

So how can an answer be formulated in relation to the questions posed in the beginning: Which are the preconditions, benefits and drawbacks when using iPad (technologically, professionally, personally)? As the above result show there are a lot of different and also somewhat contradictory pros and cons following the use of iPad. Thus the overall result of the project in relation to the questions posed in the introduction to this report seems a bit ambivalent. Probably many of these pros and cons can be related to the fact that iPad is still a reasonable new technology in the context of teaching. This means that a lot of the frameworks and tacit knowledge concerning how things are supposed to be done

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4 How to use the Book Creator App for the iPad (Youtube), https://www.youtube.com/watch?v=llJfb_1pAhg, download May 25 2015.
5 How To Create A Flyer in Pages (Youtube), https://www.youtube.com/watch?v=qFh2EC2YMDM, download May 25 2015.
in the classroom has to be reconsidered and tried out new. As we can see iPad technology puts the question on how to motivate the student more in focus. iPad also contributes to a logic where the role of the teacher is changing to more and more become: an administrator of technology and results; an innovator of formats for learning: a commenting coach and collaborator; an entertainer and motivator. Still the traditional questions of grading, discipline the time-space framework of “the classroom” are upheld.

Our focus has been on following how teachers learn to adjust to new conditions and share their understanding of ICT. In this case iPad technology. Still a lot of the results and reflections that we got had to do with students learning and thus the “efficiency” and outcomes of the teachers work, more than reflections about how the job and position of the teacher changes with tablets. A reoccurring theme was the importance of a very well prepared and well functioning technological infrastructure, needed to make iPad-use and 1:1 ventures successful. There was also a strong interest for in-service training given by external personnel (from Apple) and a strong belief in collaborative exchange between colleagues.

To a large degree these results is in accordance with what previous research has shown.

References


For us as teachers in Mathematics and Chemistry (Nicole) and Biology and Arts (Eva) iPad has a lot to offer. Especially when it comes to visualizations and creative ways of producing and reflecting knowledge processes having to do with abstract matters. In this article we want to show some of the possibilities that the iPad offers. Our reasoning is based on three cases taken from level 7 (Secondary School, age 12) and level 11 (High School, Gymnasium, age 17) each related to different school subjects with a particular theme and connected to a specific iPad function or app.

<table>
<thead>
<tr>
<th>Case</th>
<th>Subject</th>
<th>Theme</th>
<th>Aspect</th>
<th>iPad function or App</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Mathematics</td>
<td>Geometry</td>
<td>Construction of triangles</td>
<td>iStopMotion (trickfilm)</td>
</tr>
<tr>
<td>II</td>
<td>Biology</td>
<td>Ecology</td>
<td>Outdoor Experiments, home based</td>
<td>Keynote (presentation)</td>
</tr>
<tr>
<td>III</td>
<td>Chemistry</td>
<td>Natural Materials</td>
<td>Lab Experiment (producing soap)</td>
<td>Camera (short film)</td>
</tr>
</tbody>
</table>
Background

We would like to begin by giving a short general background to why we felt a need to further develop our way of working within our disciplines by using iPad.

Every day in school, as a teacher in natural sciences, you have to deal with the difficulties that students have with terms and equations as well as with non-visible molecular structures and processes. It is difficult for students to develop their own ideas about things that neither can be watched nor touched; especially for visual and haptic learners, (that means persons who need pictures to learn, or need to touch or produce something to understand). It is important that abstract topics are not only presented correctly but also visualized within their whole complexity. Such difficulties in understanding increase if the students have missed some lessons. Then they often don’t know how they should fill the gap on their own. Here the iPad can be helpful, because it gives a great variety of possibilities to rework, repeat, or deepen content.

The iPad with its integrated camera is also a great help when working in experimental lessons, as experiments easily can be documented with film or photos. As we will see in the following examples the iPad is especially useful for long-term experiments that can be documented and followed. This applies as well for experiments that need special chemicals and only can be carried out by a few students at a time. The documentation with the iPad also makes it possible to share results and to repeat contents.

Case I: iStopMotion in Geometrics

How to construct geometric figures by using a compass and a ruler is something that has been taught in lessons in mathematics for ages. Such drawings have to be carried out carefully and in accordance with clearly established rules. In this manner both 3-dimensional imagination and minute motor activity is trained. Before you can start drawing you have to figure out in a sketch in
which order to draw the different parts of your geometric figure. To get a good result you have to work carefully with the drawing equipment and develop your minute motor activity. In our region (Hesse) the task for “constructing triangles” is even more important because it is part of an annual regional competition in mathematics that all the students must pass in their 8th grade. In this test several different topics are included, for example solving equations, calculating and constructing triangles. Part of the problem is that there might be a gap of more than a year between when students learn the relevant content and the time of this test. Thus their knowledge and strategies to solve these mathematic problems somehow must be stored over time.

First students train and learn how to construct triangles in a conventional way. Here they use paper and a sharpened pencil together with a compass and a geometric triangle. In addition to this they learn to describe the different steps, which have to be done in a special sequence. The iPad is used only during the second phase. The construction process is documented step by step with the help of the app iStopMotion together with the in-built camera in the iPad. With iStopMotion the pictures come together in an animated film. Then a voice over is added. Thus the visualization is completed with narration.

Pic. 7. Filming with the iPad without tripods
By producing an animated film the students can deepen their abilities regarding both 3-dimensional imagination and minute motor activities, since they must think before they start drawing and do the drawing meticulously. This is a good practice and the students work in teams so they can help and correct each other. In the first phase one person should focus on taking pictures with the iPad while the other person does the construction. In the second phase the other person gets to operate the iPad while the first person reads the text describing the construction for the voice over.

Because there are not enough tripods in our school we had to improvise the setting. At this point the students excelled in creating great ideas. They improved the suggested solution so that non-shaky, well-focused films were generated. Pic. 8. shows nine screenshots that gives an impression of the animation. The verbal description that accompanied the film is below.

1. Draw a straight line and name the top point C.
2. Draw angle gamma.
3. Draw side a of the triangle.
4. Construct the bisector of angle gamma.
5. Draw a circle round C with radius 6.3 cm.
6. Measure angle beta at the bisector, ...
7. ... so that the Zeno of the geometrics triangle is at the crossing.
8. Continue the straight line up to side a.
9. Continue clearing the straight line on the other side up to side b. Name all points.

Pic. 8. Making a triangle with iStopMotion
The presentation of these films first took place in the classroom and the students gave comments about the films and corrected a few mistakes. Then some selected films taken from other classes were shown to support the work. Finally the parents and the math-teachers were invited to watch the films. This made the students proud and they received many compliments for their work.

After some months of preparations for the math competition the films were presented in the classroom again. The students remembered the films very well as well as the rules for constructing a triangle. After the test it turned out that the knowledge about construction of triangles was higher than the knowledge about other topics. So this effort was definitely worthwhile.

Case II: Keynote for presentation of outdoor or home-based experiments

One of the essentials of lessons in Biology is to do experiments. Experiments are performed in every grade but especially in grade 7 and grade 11 under the topic “Ecology”. Here the conservation area Dönche, which is next to Lichtenberg, is often visited. Here experiments can be conducted in an outdoor laboratory.

In middle school, that is grade 5 to 9 (10–16 yrs.), students learn how scientific insight is gained through experiments. They have to document their experiments with paper and pencil. Usually this takes a long time and the drawings differ very much in quality. In grade 7 the students learn to do presentations with Keynote. The introduction of Keynote for presentation in middle school is revived in upper secondary school when the students in grade 10 to 12 (16–18 yrs.) work in the conservation area.

Working with iPad in the field of science can be linked to doing experiments in class or outdoors, or even at home. Students should be allowed to choose what experiments to do from a list or figure out their own experiment. After a short technical introduction based on what the students already know, iPads are used
for taking pictures, making short movies, or for transferring written notes into a digital form. It is important that these images are meaningful and have a decent quality. The students should work in pairs, because it is too difficult to take pictures and do the experiment at the same time. This kind of work is fun for the students. They take care when they document their pets, for example, and also when they prepare their presentations.

![Pic. 9. A presentation about pets](image)

The teacher should not steer this process too much. There must be space where detours of thinking is allowed and the students should be allowed to work in accordance with their own experience. In middle school it is often difficult for students to restrict themselves to one variable when they plan their experiment. They often try to get it all in at once. Often they get nothing in the end. So it can be quite time-consuming to allow them to follow their own way but still they gain a lot of experience by making their own mistakes, to then rethink and correct. Help from the teacher is needed however, especially when it comes to photography and the composition of pictures.
When the presentations are finished they are shown in front of the class. Now the students are proud to present their work and other students may ask them questions, and then the presenters must explain and thus reflect upon their own strategy. Alternatives are discussed and then the next step towards “becoming a research scientist” is planned. Here you cannot speak of timesaving in general. The time that is saved by documenting the experiment with the camera is needed for deepening the content or creating interdisciplinary competences.

When reviving the presentation skills in upper secondary school the experimental setting is different. Now the students do not work inside the laboratory or at home anymore but outdoors. This means that there is no table or chairs where they can sit down and take notes, and writing on a paper is difficult when you are outdoors. The advantage of the outdoor work with the iPad, besides that it is time saving, is that the sphere of action gets wider. The easy management of the iPad makes filming and documenting of experiments easy.

The finished presentation can either be shown in the classroom during the next lesson, or outdoors on the iPad in smaller groups immediately after the experimental work is concluded. If the students should complement their presentation with information taken from Internet it is better to let them show their results briefly during the next lesson. If the presentation is just about the experiment it is better that the students rotate from one group to another and look at the results and comment on what is presented. The older students also have a lot of fun when working with iPad and often they like to put some of their personality into their presentation.

Case III: Using the camera in lab work

Soap-making is an old technique that can be used to explain chemistry in a school context. This experiment is easy to do for the students but you need at least two lessons to do it in and it is
best that only a few students participate in the experiment at a time, for example during optional laboratory work.

![Making soap](image)

*Pic. 10. Making soap*

Here the iPad is used to film short parts of the experiment. These films can then be presented during the next lesson. The learning scenario is that students who have worked in the laboratory explain to the others what they have done and then present the product they have made based on the chemical reaction. The other students give feedback to the presentation and ask questions about the experiment. This way the students get some practical familiarity with soap making. This is not so time consuming, so there is time left to discuss the chemistry theory behind the soap experiment.

A deeper insight to the chemical principles is gained by linking the theory with the photos and films as well as the reports from the other students. Another advantage is that you can reduce the amount of chemicals because you don’t have to do the experiment over and over. It is enough that you have done it
once with a few students. The time you gain can be used for additional experiments.

Summing up

It is obvious that iPad can support individualized learning and be very timesaving and also stimulate collaborative and reflective learning. In this article we have shown how the students’ abilities can be used, and that students get help when they need help. An internal differentiation arises automatically during the preparation of lessons and students become more motivated because they are allowed to follow their own questions and challenges. If students produce something with success this leads to a reinforcement of their self-confidence. The satisfaction that comes from producing something relevant is combined with the pride that follows if your product looks professional. Students do not only appropriate new content by working with the iPad they also learn how to work with technical devices. Even if the students do not succeed they can learn a lot because the failed ideas also become visible with the moving images and then their products can be corrected. Thus a reflection is provided by a combination of thinking and action.

By working with the iPad in a creative way the students not only acquire new information, they can also construct knowledge and competence, and their solving of a problem is put into a wider context. By working creatively several levels of learning gets activated and a deeper understanding is gained, whereupon not only learning but also communication and presentation skills are trained. It was amazing to see how much better abstract content in parts of Science and Mathematics were understood when they were visualized and explained in a creative way. Here the iPad is a great tool to use because it offers an incredible variety of creative possibilities.
Nicole Mahlke-Harms teaches Maths, Chemistry and Swedish, Eva Lorenzana teaches Arts, Biology. Both work at Georg Christoph Lichtenberg Schule Kassel.
In the mid 1990s a computer was set up in the teacher’s lounge at the school where I worked. I used it as a typewriter and even at that I always printed everything first and then anxiously sat down to type it in. Amongst the teachers at the school we had constant discussions about wasting energy. If the computer stood on overnight, what would the cost of electricity be? Others claimed that it was more efficient to leave it on overnight and then charge it up again in the morning. People were scolded.

Years later when I had started working at Rudbeck a teacher received funding to introduce computers to a single class. A group of young men in their first year in a vocational program got MacBooks and so did I along with the other teachers who taught that group. The directive was to use MacBook as much as possible and then assess how it could be implemented as part of the learning experience.

One of my topics was sex education so I was somewhat limited in what I could do with MacBook. I did use it for some surveys and that was good enough. It also gave some insights into the potential of portable digital devices.

When I first read about the Paducation project on Schoolsoft (a widely used platform for school-administration) I did not think of myself as proficient in technology. Still the invitation to join the Paducation project caught my attention. I liked the design of the small and portable iPad and it gave me the idea to use it for the vocational education in workplaces. What made me
eligible to participate at all in the project was that I teach English at the grammar school level where learning is integrated and where the iPad can complement the style of teaching and learning.

We all met in the Paducation project for the first time in the fall of 2013 and I felt positive about the members of the group. It was a flexible and comfortable learning environment and the expectations were realistic. I received my personal iPad and I began to explore the device by figuring out apps and so on. At that time none of my students had an iPad so there were limits to how much I could use it. I let some kids play with the camera and we made some short films in *iMovie*.

The work with iPad really began when our Paducation-group went to Kassel and Lichtenberg Schule for the first time. In the workshop sessions in Kassel some of the more experienced members had some Show n’ tell-presentations in front of the entire Swedish-German group and we had the opportunity to ask questions and discuss the pros and cons of iPads. I must say that the workshop was successful, and now we were all ready to start learning how to use an iPad at our own pace.

When I returned to Rudbeck I borrowed a couple of iPads to hand out to a group of students. We used them during some lessons and gradually we got more and more comfortable with them. Thus we built confidence in both the technology and ourselves. I also felt a responsibility towards the other members and the project managers to further develop my own competence with the iPad in order to be able to share what I had learned in collaboration with my colleagues.

All of this was inspiring. Another “engine” in my personal development was that I, from time to time, wrote entries on the project-blog. The project-blog was set up to keep up an ongoing contact between our group of ten teachers from Rudbeck (including project manager Ted Weisberg) and our ten colleagues in Kassel (including project manager Nicole Mahlke-Harms). In Rudbeck we had already 200 students who had their own iPad.
and around 40 iPads that the other 1800 students and 175 teachers could borrow on occasion.

Little did I know at that time that Rudbeck in the fall of 2014 would shift into a full scale 1:1 environment with iPads for all the students and teachers. After a year of experience with the iPad I was better prepared for this next step that my school was now undertaking.

I have come a long way with digital technology in the classroom since the days when I used my first computer as a typewriter. I teach psychology at the high school level and English and Swedish at the grammar school level for newly arrived refugees among other students. Throughout the Paducation project I have had time to figure out how I as a teacher, who interacts with a wide variety of students, can use iPad. My considerations mainly begin with this question: What is the content and purpose of the lesson I am about to prepare and how do I communicate that content? Here I can look to my iPad for answers, inspiration and support.

With my iPad I can stream educational films as soon as I need them. Before I had to turn to a printed catalogue with films that I could order, and that often would arrive long overdue. Or else I would have to roll in a big TV with a DVD player to show films, and that took up a lot of valuable time in class. With the iPad I can store all my teaching material in apps. This allows me to rearrange my lessons in a heartbeat without leaving the classroom. The iPad also replaces the need to use any old-fashioned language lab. I have been able to vastly reduce the time, energy and expense associated with maintaining an entire room full of tapes, books, maps, dictionaries, photos, films, and overhead projection sheets and the related equipment that I relied upon before the iPad.

I could go on counting the general advantages that having this well-designed and portable digital platform gives you in the classroom, but there are some specific benefits of the iPad that I would like to elaborate on. I teach English and Swedish in a
group of 16–20 year olds that have cognitive challenges. We can all work at different levels in English or Swedish without pulling up a book that enhances the differences in the pace of learning, some students do exercises at the level of a third grader and others at a ninth grade level. These differences have led to comparisons, teasing and embarrassment, but when they work in digital books with apps no one knows what level each individual is at.

I also share their weekly individual study plan on Google Drive where I can follow their progress. Most work in this group is motivational and sometimes the iPad becomes a distraction for them. So I am more restrictive in my use of the iPad in that group. At the moment I am in search for an all-around educational app that makes games and Facebook unavailable during class. I am currently also exploring Learnify (www.learnify.com) which is a platform that gathers material at a price of 6 € a year per student.

I also advise students in vocational training, and in their efforts to find jobs in the community. I am striving to use the iPad in my work with vocational training as well. A few years ago we used to talk about getting academic teachers into the workplaces where students do their internships. Instead we can now bring the vocational settings to our classroom. For example, let’s say that a student uses the iPad to record a video of a person who is experienced in changing tires. Then the student records him- and herself doing likewise. Later the two of them can watch the video together and talk about what differs and how to improve the task. The same small clip can also be brought into the classroom and we can write about it in Swedish, or make an oral presentation in English, or use that one clip as a launching point for learning opportunities in any number of disciplines. This could be motivational for students that experience work as important and worth learning, while school subjects feels less meaningful.
I also teach Swedish as a second language for groups of newly arrived immigrant students. Some of these students are almost illiterate when they arrive, while others in the same classroom have attended university or medical school in their former countries, before they were forced to flee. Here I use Puffin browser to open a platform called Safir for Swedish as a second language. Safir provides exercises on different levels and students can work at their own level and speed. I also use Evernote which is an app in which we can record and share voice notes. Usually I pick a short clip from a children’s show and then I make a voice recording of that and share it with my students. First we listen together and then we watch. After that the students listen repeatedly to it with their headphones. As they listen they write down what they hear, and then in the end we write it all on the whiteboard. This makes it possible for students without skills in written language to participate successfully in a writing assignment. Let me give an example. I have this one boy who loves this technique. He does not write anything down at first but he memorizes it all. So when it is time to work together he recites and then when we are done he writes down what he sees on the whiteboard. The iPad provides him with a positive learning experience. I appreciate this possibility to provide equality in the classroom.

The possibility to find and share information comes naturally during almost every class. So I do not feel the need to write it in my lesson plan or make a big deal about it. I can even see advantages in some of the non-academic activities in this group. Some of the newly arrived students use Skype behind my back, when they are supposed to be focusing on their schoolwork. That sort of behavior can frustrate me but I try to remind myself that having a friend, or in this case maintaining an old friendship from far away, has an importance given the fundamental life changes that these students have gone through. Remember, first and

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foremost they are teenagers and their sense of social belonging is essential to their learning.

I would like to conclude by stating that the way we worked in the Paducation project has suited me better than the way the implementation of iPads has been done at Rudbeck. Now, in Rudbeck, the iPad is expected to be used in all lessons and many perceive it as a pedagogical method in itself. To me an iPad is not a teaching method but a great tool that gives me enormous possibilities to expand my own teaching methods.

Ulrika Molin teaches English, and language intro at Rudbeck.
During the last decades there has been a growing use of visual methods within different areas of education. Most of these methods for visualization are easy to use for both teachers and students and they offer an easy way to create your own products. One of the most classic methods for visualization is the mind-map which is used also in non-educational settings. The other prominent method for visualization is the concept-map which may not be so well known outside of the school world and the universities.

On the basis of my own experiences of being part of the Päd-ducation project and from my work as a teacher in Religion and Politics/Economics at Georg-Christoph-Lichtenberg-Schule in Kassel I will describe and reflect on both methods in a more general sense (what they have in common and in which aspects they differ from each other). I will then say something more specific about the experiences I have from working with mind maps and iPad.

Three methods to extend your thoughts

Building bridges between islands of singular information and “making a real brain out of your head instead of purely saving 1 and 0 like a computer” will only happen if knowledge is shared and connected in new ways. This may happen during an ordinary conversation between students, but probably this potential
for learning will be more sustainable if you can visualize the acquisition process. The easiest way to do this is probably to put the ideas down on paper but if you would like to share these ideas and reconnect them, or work on them together with other learning partners, you need a more technical solution. All of this may start with brainstorming, followed by a mind map or a concept map. Let me first explain some differences between these two methods.

**Brainstorming**

Brainstorming can be described as an “anarchical mapping method” because it often relates to things that happen in the beginning of a learning process. Brainstorming is based on a subjective process and the pre-knowledge the persons involved have. This can open up new associations and lay tracks for new forms of knowledge. When you use this brainstorming pedagogically you should start with an easy assignment, such as: “Think about the United Nations”. Then the students will begin to think about terms that they associate with the UN and they will do this without a deeper understanding, but something happens when they visualize their associations through cloud-like formations.

**Mind maps**

Basically the classic mind map takes more time to create than “to do a simple brainstorm” and it often develops in several steps. One possibility can be to work together on a single mind map but to complete this may take many hours. Then you can use a mind map over time to show connections between different parts of knowledge or you can connect them with other mind-maps, or even put it in relation to mind maps concerning different topics.
6. MINDMAPS AND OTHER FORMS OF VISUALIZATION

Concept maps
A “concept map” is a method where you re-connect your learning content and build new connections. That means that if you want the students to save and expand their knowledge about the UN for example, you give them cards with keywords like: Security Council, General Assembly, Veto-Power etc. These concepts form the basis on which the students then will work. The students are asked to create a big map where they visualize structures, relations and processes; thus enriching their own knowledge.

All the three above mentioned methods can be used also without an iPad and they can be used by individual students, but I have chosen to focus on collaborative learning supported with the possibilities provided by iPad. Nowadays there are good technical solutions available in the AppStore where you find apps such as SimpleMind or iThoughts HD. There is a great variety of apps around, some of them you get for free, or you can pay to get hold of more functions, have a nicer surfaces etc.. I will now conclude by saying something about my experiences from working with mind maps and iPad.

Doing mind maps with iPad
I have used mind map programs on computers for years to advance my own learning, and mind maps have helped me to organize my learning and look for connections between different fields of knowledge. These personal experiences led me to the question if students could use the same processes successfully. That was the background to why I began to work with apps like Popplet, Bubbl.us and iThoughts. I have used all of these apps in the same course and also made sure I have had time to reflect upon my own use of these apps.

Let me present an example. It was in an upper grade course in Politics and Economics and we were just starting our work around “The ideal state” and we were to continue with this for
more than three weeks. At first the students started to think, or brainstorm around their own ideals. Then they got more and more “professional” in showing the other students their products. They also practiced taking a position and maintaining an opinion. All of this was supported by the use of iPad and the apps I mentioned earlier, for example Popplet which is a tool for the iPad and web that you can use to capture and organize ideas in a mind-map for learning, thus helping the students to think and learn visually. With these apps students can capture facts, thoughts and images, and learn to create relationships between them. But there is no function for folding the branches. That means that you always see the whole product and if you use a projector you cannot be sure that all of the students will be able to recognize the terms in the frames.

Final words
So what are the general benefits of using apps for visualizations?

A)  Organization; these apps help the students to organize their knowledge.
B)  Usability; these apps are easy to use but saving results and continuous work the next day can be problematic, or not even possible, depending on whether the students have their own iPad or not (in Lichtenberg that is not the case).
C)  Showability; some apps do not allow you to zoom the result and this means that you cannot really use them in the classroom because you cannot screen the result with a projector.
D)  Time; as mind-maps are easy to produce and if you use them in an appropriate learning environment you will gain, not lose time, because these apps help the students learn better and faster.

Using mind maps and concept maps may enrich your education and if you start using iPad you will find a lot of usable apps.
Then your students will find their own way to comprehend them. Still the main question remains, what are the most essential pros and cons when you compare app-based visualizations (mind maps, concept maps etc.) to paper-based solutions? I cannot give you a final answer to this. So check it out for yourselves.

Gabriel Hund-Göschel teaches Politics, Religion and Economics at Lichtenberg.
As a teacher in Arts and Media I have had a strong and positive experience of using iPad. I have been using it for a couple of years now and it really works well in combination with analogue practices such as drawing, sculpting and painting. I have also noticed that iPad work well for documentation as well as for creating photos and in production of film and audio. It is hard to reflect upon iPad without bringing up aspects having to do with platforms such as Google Drive. This article consists of some reflections on how to use iPads in relation to Google Drive when working in art classes. I will also describe the contact and collaboration that I have had with my project partner Martin Fiola who teaches art in the Georg-Christoph Lichtenberg Schule in Kassel.

iPad and the creative process

When working with art the process is as important as the result, at times even more so. This holds true also in the context of a mandatory education. Here iPad can be a useful tool for documenting, sharing and commenting and this is something that adds on to the student’s experience of their own studies.

In the beginning of an art project I always ask the students to share their ideas with me on Google Drive. This enables me to follow their work and to read and comment all the written parts of their projects – when they write down their own thoughts they have begun their learning process. By using Google Drive I
can easily communicate with the students and get them “on the right track” by asking them to write something about their own project. This aspect of my teaching goes smoothly since all of our students now have their own devices.

One example of a very successful project was when I, in addition to written comments, asked the students to take photos of their drawings every now and then during their work process. When the work was finished I asked them to reflect on their own creative process by using iMovie, commenting on the images and by writing comments. This resulted in several beautiful films, many of them with quite a poetic tone. The premises for the documenting/reflective film were the following questions. What was I supposed to do? How did I do it? What was the result? How could I have made it differently?

I also let the students use iPad as a tool for making art. The Apps they used were SketchBook and InkPad. With these apps you can make illustrations by using tools that resembles the ones you find in software such as Photoshop or Illustrator. Of course the opportunities are limited but you can still do exciting art. It is interesting to compare work done on the iPad with work done with traditional art material. When you are using an iPad you work much faster and you don’t have to hesitate in taking risks that may destroy your image since it is always possible to make a copy and do another version. iPad allows you to be playful, exploring, fearless and humoristic; and you always get a second chance.

Another aspect of using an iPad is that the students can share pictures and links that they have found on Internet. This means that they can show me where they have found their inspiration. Or they can take a photo of a sketch they have made themselves. All these forms for sharing are worth a lot to me since it gives me the opportunity to give the students almost instant feedback. They post and share then I read and comment.

As I wrote in the beginning of the article there is a natural link between an iPad and Google Drive, because Google Drive is
a perfect way for me to share all kinds of (mainly visual) materials, such as photos, paintings, design, architecture and drafts with the students. With Google Drive I can also “flip the classroom” and make keynotes and documents available online for students who missed class for some reason. Also material is available online as a reference for reflection and analysis.

Even so what I really love about teaching is its now-ness and immediacy and to just be immersed in the learning situations together with the students. That means that teaching or feedback given online is more of a complement. I still prefer the conversation face to face. But there are situations where it is easier for the student to express their personal thoughts in written form and make them available for me on Google Drive. Another advantage with the iPad and online contact is that it is easier for me as a teacher to be personal and well formulated when I give feedback than when I am surrounded by students in the classroom.

One obvious risk with the extended or unlimited classroom is that your workspace and working schedule becomes limitless. I mean, when your students can reach you everywhere and anytime, and when you can work wherever and whenever you want, this can become too much. If you really love your work and your students it is very important for both your health and your private life that you are able to disconnect after working hours. Otherwise you might end up in a situation where the students expect you to be online and available night and day. There are also some risks to be aware of when you flip the classroom. The students might think that it is not necessary to devote themselves whole-heartedly to the lessons, and they might assume that they can check out things on Google Drive whenever they feel like it.

I also want to mention something about how I have worked with the iPad within the introductory Media Production course for 16–17 year old freshman high school students. Here the iPad has replaced the more complicated and hard to handle digital photo-and video camera and its accompanying software and equipment for photography and film and sound production.
When you use iPad the story you want to tell can be the main thing instead of being locked up with complicated and time-consuming technology. To work with film, photo, sound, and graphics in an iPad is to a large extent self-instructive and it is easy to get a good result that even resembles professional products. This has a fundamental and empowering effect on the students. By using iPad on the basic level the students are much better prepared when they start working with “professional tools” in the more advanced courses in Media Production.

Cross-national

I want to end with some comments on the collaborative and cross-national aspect of the Paducation project. My “partner teacher” in Lichtenberg Schule in Kassel was Martin Fiola. We decided to work with the theme “Identity” simultaneously in our respective classes in Kassel and Stockholm. We exchanged pictures of artworks and had the students respond to each other’s art pieces. First I received 18 interesting artworks from Martins class. My students got one of these pictures each. Then I asked my students to make an artistic response to the picture they had received from their German counterparts. The students were free to respond in any media of their choice as long as the iPad was used in an adequate manner. For example to take photos, film, video, work in Sketchbook or Inkpad etc. If they chose to make a drawing, painting, or sculpture they had to document their work with their iPad. My students worked for a couple of days in order to respond to their “partner student” in Kassel and finally we sent all of the artworks back to Germany together with selfies taken by each student in the Swedish group.

It was really touching to see the respect and curiosity displayed for the task and there were many warm smiles and happy faces in the classroom when we looked at the material from the German students. My students were all very happy to see the photos where the German students presented their artworks and they were really excited about seeing the creator and to read
about their intentions. They received a message from someone and tried to create an answer as personal and interesting as possible. This reminded me of the pen pals I had as a child. I remember how a friendship and understanding grew through the letters.

The Identity-project was easy to make with iPads and the iPad made the distance between our schools short. With just a touch on the screen we were in contact (next step could be to communicate via Facetime during lessons). Since all of the students now have “their partner” in Kassel we will be able to develop our collaborative project and continue communication in our art dialogue with the help of digital technology. This is one example of how we can use iPad in creative processes and how technology can be used for immediate communication and to be in touch and work together although we located in different countries.

Ylva Sanner teaches art and media at Rudbeck.
8. iTunes U for me

Pernilla Hammarström

Just a little shy of two years ago an iPad was the perfect tool for me to wind down with after long working hours. I watched movies and I played games. I used social media, documented my surroundings with its camera. I drew and painted in creative apps and I looked up things I was curious about. In other words, iPad was my digital theme park. That was the level of my pre-understandings and know-how when I as a teacher in History and Swedish entered the Paducation project to later become part of the 1:1 venture in Rudbeck. After two years in the Paducation project and now working in a full-scale 1:1 environment I have a different comprehension of iPad. Now it is mainly a learning tool for me.

What I will focus on in this article is more indirectly related to the iPad as I will discuss platforms for creating courses, more specifically iTunes U. In the following I will explain why and how iTunes U has revolutionised my teaching and argue for us to continue working with iPad in combination with iTunesU.

iTunes U

iTunes U is a platform developed by Apple which facilitates educational materials. The material ranges from lectures open to the public and from preschool to Ivy League courses (Ivy League schools are generally viewed as some of the most prestigious and are ranked among the best universities worldwide). iTunes U is also a platform where teachers can create their own courses for students to enroll in. It was in this capacity I first became inter-
ested in learning more about iTunes U. iTunes U is as Money-crashers.com explains:

A completely free medium through Apple iTunes applications where colleges and universities can offer courses at no charge, to anyone who wants to take them. There is also a new section of iTunes U that focuses on K-12 education, where state or county education departments provide content for both students and educators. Currently, over 800 colleges and universities from across the globe provide content to iTunes U for post-secondary learning, and 15 states in the US offer K-12 learning tools.¹

So how come I started using iTunes U? As it happened a few colleagues and I were fortunate enough to participate in a workshop on the subject of iTunes U held in my school by Abdul Chohen from Essa Academy in Bolton, Great Britain (www.essaacademy.org). This workshop became a turning point for me in relation to the Paducation project as well as in relation to the 1:1 implementation at Rudbeck. With iTunes U I all of a sudden found a workspace where I could use iPad without the kind of problems that I had experienced with Google Drive – the platform that both the municipality of Sollentuna and our leadership at Rudbeck had promoted. In Google Drive documents failed to sync, students were having trouble finding shared documents, and various media had to be configured before being uploaded. For me it is now evident that iTunes U is the way to go for schools that choose iPad as their device.

Developing the course

Inspired by Abdul Chohen’s workshop my colleague Hedvig Holmberg, who teaches English and Swedish at Rudbeck, and I decided to try using iTunes U as a cooperative tool. What we

wanted to do was to create a course together and share teaching materials. The course we chose as our first project was Swedish 2. This is a course that the students take in their sophomore year in high school. The course focuses on four main modules: history of literature, grammar, argumentation and how language affects society and vice versa. We decided that this was a great course to start with because there is no National Testing involved. This means that cooperation would also create a natural ground for comparing assessments and through that ensure equality and quality for the students. It was also the ideal course because we felt, as many of our colleagues, that the existing resources for this particular course were inadequate and that we could use this opportunity to create improved materials together.

For each module we created four or five sub-modules including the different tasks and examinations every module needed. In every sub-module we uploaded instructions, resources created by students and us, and of course professional film clips, newspaper articles, excerpts from books etc. This in turn made our course tailor-made for us, and we could involve the students by pushing them to create substantial materials they were meant to share with each other and use as source material when writing essays, creating presentations and so on.

Developing the material

In order to create our course materials we turned to iBook which as indicated by the lower case “i” is yet another program from Apple, and yet another program that works beautifully together with the iTunes U application on the iPad. The one major downside of iBook is that you (up until recently) need MacBook to create your material. If you do have access to this you have the possibility to create professional textbooks with interactive elements specially designed for your courses. Or at least that was what Mr Chohen told us during the aforementioned workshop.

Hedvig and I decided to try iBook to create a textbook for our module on the early history of literature. We agreed on a theme
– Death – and looked for texts from ancient Babylon, Greece and Rome up to the Swedish Renaissance dealing with that subject (not that hard to find really). We compiled the chosen excerpts in one of the iBook themes available to users, added our own writing to explain the periods, and some authors and what to look for when studying the texts. In addition we embedded pictures, film clips from movies re-enacting the periods visually and Keynote presentations from in-class lectures. We noticed when using longer sections of texts that “scrolling widgets” added to the user experience while making the materials easier to follow for students not familiar with reading older texts. Once completed, we simply uploaded our new book into iTunes U and a new course was born. I will not go into more details but the pure fun that we had as teachers when we were creating the book and then the successful reception with our students led us to immediately create a grammar book, more or less styled in the same fashion but this time including interactive exercises.

The Master Course concept

When you develop a course in iTunes U you should create what is called “a master course”. That means a course that can be copied and then modified by each individual teacher. The concept of the master course is that it is the backbone of the body of the course. If a teacher wants to dress its body a bit different it is fine but underneath the garment it is still the same spirit, and that should ensure equality and quality in education.

When we created our course we also presented and kept on presenting our modules to each other so we always could ask ourselves how the module represents the syllabus and requirements of The Swedish National Agency for Education (Skolverket).

Our method in our first endeavour was basically a trial and error approach. In hindsight this maybe was not the best method, partly because our mutual over-enthusiasm caused us to overlook a few things that aren’t optimal in iTunes U and partly because we didn’t foresee how long it would take to set up a
course together. With this experience in mind I suggest the following when collaborating with a colleague in usage of iTunes U.

- Bring your vision to the initial meeting but be open to all suggestions.
- Share your ideas and listen.
- Decide together which ideas to go forward with and divide responsibilities for your course.
- Create a master course together and copy the course for each individual teacher, but remember that you can only be up to six co-creators in one course and only one can own the course.

If you keep the above in mind you will be provided with a powerful tool when creating a course together, but also when creating your own. It is important to remember that only 50 students can enrol in a course on iTunes U. That means that you usually cannot have more than one school class enrolling in the same course.

**Google Drive v/s iTunes U**

With a few courses up and running in iTunes U and a few still on Google Drive I have noticed that my courses in iTunes U appear as a lot more structured than the ones I do in Google Drive. I have also noticed that my students very seldom are confused when I set up courses in iTunes U whereas Google Drive often prompt questions about where to find materials etc.

From my perspective this relates to the structure of the platforms themselves. At first Google Drive, that is produced by Google, and iTunes U, which is produced by Apple might appear as equivalent. Google Drive is a file storage and synchronization service and just like iTunes U, it allows the user to store files in online clouds. Through Google Drive you can share files, edit documents, spreadsheets and presentations. It permits collaborative writing in real time as well as editing of documents, spreadsheets, presentations, drawings, forms etc. But there are some
differences. Google Drive is folder based. Whereas iTunes U provides content based structure where a table of content presents every module of the course as soon as you enter the “digital classroom”. This means that when using iTunes U you don’t have to enter a course folder and navigate your way to yet other folders or finding the right document among something like 25 other documents. Instead you enter a digital space where each module has its own clickable link in the table of contents that greets the user.

But perhaps the most important difference is this. Before we started to use iTunes U I struggled to get the students to actually work on their iPad, and I noticed that students constantly ended up in games such as Candy Crush, Hearthstone and Modern Combat (online or in an app) instead of focusing on the teaching material. This was not necessarily due to of lack of interest in my lessons but because of the allure of the fun the tablets displayed. With iTunes U this becomes different. When you link an app within the framework of an iTunes U course the students enter that app directly without leaving iTunes U, and when they close down the app they end up in iTunes U again. If the students haven’t got the app installed they automatically get directed to the App store. Thereby I, as a teacher get a confined space where I am in control, without losing the perks of what an iPad can provide. Finally I want to point out a few benefits worth exploring in the future when working collaboratively with iTunes U.

- You and your colleague(s) can save an enormous amount of time as teachers by using iTunes U although it takes a lot of initial “investment time” but in the long run it will be very time efficient.
- You evaluate your own work continuously.
- You can create a master course that assures that the students get the same level of education regardless of which teacher they have.
- Teachers new to the profession and /or to the school can get a much more in-depth and less stressful intro-
duction to how courses are structured by copying the master course.

- Teachers get base materials for their continued careers.

Final words

I am aware that I have come across as very positive about iTunes U and of course there are things that aren’t optimal with this platform but I do believe that we can use the structure of iTunes U and its compatibility to most media to move some of our teaching outside of the confinement of the physical classroom. We need to enable students to interact with society by creating a bigger stage with a wide variety of impressions and/or learning experiences for the students to connect their learning and knowledge to the outside world, both socially and academically. Then perhaps the iPad can reach its full capacity being both an educational and recreational tool.

For the time being there is something with the “squareness” of school that doesn’t sit right with the “roundness” of an iPad. It might be that plain walls of schools do not encourage creativity. If we cannot use the creative benefits of the iPad then maybe iPad is not the best tool to use in school but I do hope that something will change our traditional view on what a school is, and realise that for our educational system to develop and challenge its students we need to adjust to how society is evolving.

Two years ago my appreciation of an iPad matched the one that many students can have, that is iPad equals funPad, but today most students at Rudbeck, just like myself, have a different comprehension of iPad. Not the least thanks to the connection between iPad and iTunes U.

Pernilla Hammarström teaches History and Swedish at Rudbeck.
For me as a teacher in Swedish, Rhetoric and Media and Communication iPad together with different online functions has meant a great difference. Based on my own experiences from Rudbeck this article focuses first on how iPad can be used for documentation and communication with students, and secondly on how iPad can be used as a tool for multimodal production in history classes. I then relate my examples to my acknowledgement to some theories on formative learning and multimodality.

Documenting for feedback

In the fall of 2013 I decided to stop using textbooks in my course in Rhetoric and instead go all in with the iPad, at least when working with rhetoric and speech-training. Using film for documentation is in most cases preferable, and especially when it comes to coaching speeches and presentations. It all started with me filming my own teaching to coach myself. I understood my hands lived their own life gesticulating and my body language was much more active than I thought. After recovering from my first chock after seeing myself this way I introduced the method to my students. I asked them to reflect upon their progress in dialogue with me over the web, where I could read and give feedback to each student individually. During class we explored the cornerstones of rhetoric, using presentations in Keynote, clips from YouTube, text excerpts from famous speeches etc.
Everything was shared with the students on the web via cloud computing and it was accessible throughout the course. During the course the entire group of students made three speeches each and one presentation. All these speeches where filmed with the iPad. Then the files were saved in each student’s personal digital folder. At the end of the course they looked at their “performances” and made an analysis of their own progression.

Many were doubtful and they all felt quite uncomfortable when watching themselves on video. Still every single student emphasized the fact that they had developed their skills faster and with greater quality than they would have done without the filming. Now the students could study their own rhetoric delivery over and over again and find strengths as well as areas to develop. These aspects can be hard to formulate through traditional feedback, as reflected in these two quotes, by two girls in their senior year of their Upper Secondary School education (taken from the students’ course-evaluations).

In the beginning I was quite dubious about being filmed but it was great because I could see what I had to improve. I don’t think I would have made the same progress if I hadn’t seen what I looked like while making my presentation.
(Student A girl aged 18)

Though I hated to watch myself performing the speech, it gave me a clear and real picture of what I look like, what I sound like and how I act. And that has been the best feedback ever, though it did hurt from time to time. I have been able to develop and strive for a new appearance at the next speech. It has been very good for me but I didn’t enjoy it.
(Student B girl aged 18)

You can say that the students “performed” their speeches in front of the others, i.e. their “audience”. This audience gave them instant feedback as well as suggestions for improvement. I arranged this through a digital questionnaire that registers the responses in each speaker’s digital folder. The student performing
the speech was then supposed to look at the filming of their performance, take part of the response from their peers and form their own written reflections on what they thought they could develop further, i.e. the factors for success and different developmental areas.

A successful way to create this ability is to allow the students to give feedback to each other and then let them process and reprocess their assignments a number of times; all in accordance with the principle that the best way to learn is to become aware of your own mistakes. Teachers have always assessed and commented students’ texts but few have given the students the opportunity to work further to improve their assignments. When my students write analysis and essays they share their texts with me digitally and I use the annotation function in Pages to give them feedback. After my feedback the students reflect on my comments and revise and rewrite.

I really appreciated the chance to submit a text a number of times to get feedback and then retry. Thanks to the teacher’s merciless comments and my rewritings I became aware of my weak points and could improve faster. Now I can write in a more mature language and I am more aware about structures. (Student C boy aged 17)

In a lecture in Stockholm about two years ago one of the “big names” in formative learning Dylan Willam (c.f. 2011) presented formative learning and stated that you can only talk about feedback if the student is given a chance to apply it. To collaborate with the student in an on-going process until the student has reached the learning goals and the text has come to its final version is the very heart of formative assessment. This might seem like a lot of work for one teacher; to read, comment, and assess many versions from each student. But it is not. I don’t have to read all of it on each occasion, just the parts that have been modified. Here I use the track changes function that helps me to easily find what has been added to the text and focus on that.
Digitalized formative assessment through multimodality

Another area where the iPad has turned out to be very useful in my work is in the history of literature which is an essential part of the Swedish courses that I teach. This is an area well suited for digital and multimodal ways of learning. In these courses we work with literature from different eras but already from the start I leave it up to the students to choose a historical epoch for their specialization. Then the course begins with an inventory of authors, philosophers and opinion-makers as well as the social aspects of each epoch. Thereafter the students work in groups with research, seminars and discussions in order to prepare a lesson or workshop to convince the class their epoch is the most interesting.

I have never thought highly of Swedish as a school subject, but now I have a changed my mind completely. I have REALLY improved myself when it comes to Swedish.
(Student D boy aged 17)

During the course the students write notes about facts, reflections and progress. They store this in a digital folder that is open for me to read, and then they continuously give feedback to each other. Through the folder I can follow their on-going creation of texts, scripts, clips, facts and presentations. I can also survey their working process and follow their knowledge progress “live” while the students are working and nothing can be misplaced.

The student’s appreciation of this method becomes very clear when you follow them during lessons and in their workshops. Here I have seen imaginative and versatile debates, dramatizations, presentations and even rap music with very well composed lyrics. All of this prepares the class for fruitful discussions and analysis.
This is the only course where I have been working with digital folders this much and it makes things much easier. It’s all gathered, over-viewable and cannot get lost since you can reach it from any computer or tablet.
(Student E boy aged 17)

When the students gather, chose, process, and present the material they are in charge of, it is their own learning process and they feel responsible, and when a student has conquered the ability to evaluate the quality of his or her own work, they have come a long way.

Another interesting thing is that students who find history of literature boring can gladly edit a film to do a presentation. Some students do not dare to give a speech but here they can gladly record a radio show about how to perform the perfect argumentation. Maybe you do not want to write a traditional analysis but you are happy to present your thoughts in an interactive e-book. Working with film both for documentation (as in training rhetoric speech) and for presentations (as in history of literature) has given my students invaluable tools to use in their own improvement. It has also helped me in my mission as a teacher, to prepare and educate students for an unknown future.

We do not know exactly what qualifications will be needed in the future, neither in the labour market nor for citizens in a globalized network-society, but I know for sure that it will not be sufficient just being able to read and write and handle math. Therefore we should try to think more multidimensional and “outside the box” so that we together with the students can practice our multidimensional and multimodal flexible problem-solving competences and here iPad present some routes and solutions.

Formative assessment as a context for productive use of iPad

For me iPad as a learning technology works best if it is used in relation to a consistent pedagogical idea, and I think that one
reason for successful use of iPad at Rudbeck has been that our school was oriented towards formative learning already before we started to use iPad. Personally I was already familiar with formative learning when I started to use iPad. Since then I have developed my interest further.

I have two strong influences in this respect. The first one has already been mentioned, that is formative learning as John Hattie presents it in his book *Visible Learning* (2009). This is a study on what impact different factors can have upon students’ learning outcomes. Students’ knowledge of learning goals, feedback and the teacher’s teaching skills are some of the significant factors. It is all about giving the students the ability to assess the quality of their own work, and from that they can decide how far from the stated learning goals they are. The aim is to make the students active in their search for evidence of their own learning process. It is not just about doing the assignments, but also to understand what they have achieved in their learning. Much emphasis is placed on feedback, not only the teacher’s feedback but also the student’s reflections.

The second perspective that I am inspired by is “Design theory” as is presented by Staffan Selander and Günther Kress (2010). While Hattie (as well as William 2011) focuses on the development and outcomes of the formative process as a way for the students to achieve “excellence”, Selander’s and Kress’ offer a less instrumental and more constructionist view. Design theory makes it clear that learning processes are realized by using multiple messages and meanings, meaning that the recipient and interpreter are active and participatory performers and that learning always is multimodal. Therefore I base my teaching on how to catch the attention of the students and what resources (text, sound, image, etc.) they find motivated to use in order to interpret, process, transform and shape a new representation of their own knowledge. You could say that Hattie expresses a similar approach when he emphasises the importance of giving students a basis to continuously ask themselves the following ques-
tions. Where am I? Where am I going? How do I get there? In other words the challenge for a teacher today is to create a sign producing activity where the student is given the opportunity to develop a sense of assessing quality in different representations of learning and how far away from the learning goal it is. This also means a change in the classical role of the teacher, from being the one up at the front. With formative learning and a design perspective the teacher more becomes a part of the group, a dialogue partner and a coach in a more collaborative production of knowledge.

Long before iPad came and even before the early phases of digitalization of schooling Norwegian pedagogical researcher Olga Dysthe (1996) underlined that the voice of the teacher should be just one of many voices in a classroom. Instead of monologue and expertise the ideal was to form a “polyphonic choir in the classroom”. When this was written in the mid-1990s Dysthe confined it to writing and speaking in literature and language classes. With today’s access to digital tools and Internet students can invite voices from the whole world to the classroom and just by sweeping their finger on their digital device they can gather texts, sounds, photos and films. The benefits of this openness and multimodality is that this selection of facts reveal the level and profile of the students prior knowledge and thus gives a hint to the teacher where to start, in dialogue with the students formative learning process This also makes the students feel that they are responsible for their own learning process.

A final reflection

A digitalized learning environment as the 1:1-project at Rudbeck can be very successful if it is carefully planned and performed. According to a study by Åke Grönlund (2014) who is professor in informatics at Örebro University the use of iPad for teaching in third grade increased the number of children passing the national tests in English and Mathematics by 19%. In his study Grönlund observed three groups, each working with a different
model, in relation to how they performed in a national test in Swedish and Mathematics. In the first group (G1) the students used iPad in accordance with a pedagogical model called “Write to learn” (iWTR). In the second group (G2) the teaching was traditional and done without iPad. In the third group (G3) the students were given iPads but without any pedagogical plan. The result was that G2 scored the same as they had done the previous years. For G3 the results were lower than before. For G1 the results had improved with 19 percent. Thus the conclusion was that iPad is not the solution to everything.

Some of the reasons why the Paducation project has worked out well in Rudbeck are the following. We have done a lot of reading of pedagogical theories. We have had a lot of testing and many discussions amongst colleagues. But the most important factor is the collaboration with our students. Our students are digital natives (c.f. Prensky 2001) and together with the pedagogue they have found ways to use iPad to challenge, collaborate and learn in a new way.

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References
When I first heard about the Paducation project I was rather enthusiastic but I didn’t ask to join at first. It was my principal who told me to do so. She said I would fit in and that this was a perfect project for me and that it would be good too for the Paducation project to have an English teacher as part of the group. This made me feel both needed and chosen so I joined. At first I was skeptical and at the first meeting we had in the group I made sure that everybody understood that it would be a great step for me to take to start using the iPad as a teaching tool. I found it difficult to picture myself using it in the classroom.

It was when I started using the iPad for private purposes (reading e-mails, reading e-books, making photo books from journeys I made with my family) that I started to feel comfortable using it and I realized that I liked the idea of using it in the classroom. Then we went to Kassel where we met our colleagues from Lichtenberg and this trip was very inspiring. The Show n’ Tell-sessions during the first workshop gave me many ideas on how I could use iPad in my teaching. Not only could I copy ideas from the others, I also began processing my own based on what I had seen.

When we got back home I was determined to start. At that time however, it was difficult to get hold of enough iPads for the students since others constantly booked the set we had at our school. However I was fortunate to have my classroom next to a
colleague who also was part of the Paducation project and he used iPad all the time so I could borrow a few of the Ipads he had at hand to use them in my own class. My students used them in groups and made films and presentations. They thought it was fun and I also felt inspired to continue. I started to see the many possibilities that iPad could offer.

At the end of the first year of the Paducation project in the spring of 2014 our school Rudbeck decided to shift into 1:1, starting from fall that year. The headmaster decided that iPad would be the device that our school should bet on and implement in full scale. Just like everyone else in the Paducation project I was happy because I could see how the venture with 1:1 would offer possibilities to change things in my own teaching once all the students had their own iPad.

Since our students got their own iPads I have used them quite often, and I have changed some of my teaching. You can say that I use iPads in four main areas.

First of all, *I do all commenting and grading digitally nowadays*. I did some of that before but now when the students have their own iPads I can ask them to read my comments in class instead of at home. Then I can answer their questions and have them improve their work right away. My comments will not disappear when the students bring their work home as it did before when the students had all my comments on a piece of paper. These papers didn’t always make it home and back to school.

Secondly, *the students take notes and do all their writing* on their iPads. This is also related to the platforms we use. I use Google Drive and make the students use it too. There I share folders with them by using *Google Doctopus* (which is an add-on to Google Drive that help you distribute folders and documents to groups). I give them instructions and comment their documents on Google Drive and they take their notes and do their writing assignments there. Hereby everything is saved in one place and the students can easily go back to my presentations and their own notes when they are working on a final assign-
ment, oral or written. Before we started using iPad I used to give my students writing assignments to work on at home. But then I could never be sure that they had done their assignments without help from others or without cheating. Nowadays I can force the students to first write in the classroom, as if taking a test, and then follow their writing online. I can also lock the iPad so there is no way for the student to cheat. Before, home assignments also meant that some students never were able to get their work done and thus failed the course. Now these students get their work done as the have to do it in school.

Thirdly, iPad is perfect when you as a teacher want to make presentations to the class, for example on topics such as “English speaking countries in the world” or “Scandinavian languages”. A difference now compared to before is that I no longer have to be the one “telling the facts” or offering the students flashy power point presentations and the like. They can do all that by themselves in different groups, by gathering information and creating presentations about different areas. Instead I can be there to help them sort out the best information, and teach them about how to give instructive presentations.

A fourth area where iPad is useful is for reading articles and fiction. I haven’t got to use the iPad for this so much yet, but I will definitely do it more in a near future. One reason for not having done this yet is probably that I want the students to be aware of and “feel” where the text originally was published; in a book, a newspaper, a magazine.

Having shifted to 1:1 has not only been a positive experience. For example there was a total breakdown in our Google Drive in November 2014. Our IT service changed the domains for the students’ e-mail accounts for the whole municipality and that caused an absolute and total mess. Suddenly we could all see and edit each other’s documents. Then there have been other problems with the students’ Google Drive documents because these were not synchronized with their teachers’. Another thing that has happened was that documents suddenly began to disappear.
from students’ iPads. This made me and other teachers accuse students of not having done their work. So there were many sad students last year.

Another negative discovery I have made is that iPads cannot be used for making the mandatory national tests, because a secure testing situation cannot be guaranteed. Our IT-section is working on that however and there is a company that is developing something called digi-exams meant for taking tests on the iPad, without the students being able to surf the internet for answers or saving the text on the iPad.

Many teachers think that the students become less concentrated when everyone in class has an iPad, but I don’t agree. Before iPad, smart phones made students distracted and they still do. I usually solve this by constantly telling them that they must put aside their iPad and their smart phone, especially in the beginning of the lesson or when someone else is talking. But when they are working on their own or taking notes they are welcome to use whatever device they like.

I make the students use their iPads quite a lot but I myself still prefer to work on my computer, especially when grading, giving comments and making presentations. I have tried to force myself to use the iPad for this kind of work, by leaving the computer at school, but I’m still more in love with my computer than my iPad. Maybe this will change next year when I have promised myself to work on platforms such as iTunesU and Showbie instead of using Google Drive. I have also promised myself to start off next year by including the students in the planning on how to use the iPad in the classroom. In the beginning of new courses I will give my students more defined information on how I will use it and what apps they should have. I will also have discussions with the groups on how they would like to use it in class. Thus I will go on travelling on the iPad path and I will continue bringing the iPad on all my journeys.

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11. Making Histories

Andreas Heuer

The topic of this article is how iPad can be used to create differences in relation to traditional conceptualizations of History, which is one of the subjects I teach in grade 9 to 12 at Lichtenberg (I also teach Philosophy and French). The main question I want to approach is this: In which way did iPad affect and transform the learning and teaching in history class?

This article can be regarded as a resumé and an evaluation of some of the outcomes from my past two years working with iPad in connection with the Paducation project. I will argue for the many possibilities that iPad can give as an opener of alternative and broadened conceptualizations of “History” when working in a context of multicultural classes and in relation to “digital natives” (Prensky 2010: 1ff.). I will also offer some concrete examples from my own teaching, but first I want to give a short theoretical background to my argument and my observations.

History – a big picture of change

The German sociologist Dirk Baecker (2007: 7ff, 2008:1ff.) distinguishes between four eras or types of society in the human evolution: The Tribal Society, The Ancient Society, The Printing Press Society, and The Network Society. Each of these types has been founded on different technologies for diffusion of knowledge but these different forms of society are also overlapping. We are still reading, talking etc. but today we are also increas-
ingly embedded in The Network Society with its multimodal techniques and globalization (Castells 2009).

The Tribal Society was mainly verbal in its nature which called for oral techniques for storage and dissemination of knowledge and memory. Knowledge was mainly in the hands of aristocrats and shared inside closed circuits of the elite. The Ancient Society added writing to the spoken word and this made a much more complex structure for social life and learning possible. Now social communication partly started to rely on writing which lead to a more uncertain time horizon. Books become more important for claims of knowledge, truth and authority. The access to knowledge through written documents became part of ruling and governing. The Printing Press Society was founded on techniques for typography and print was added to writing and speech. Now knowledge through printing could be diffused in a more complex and widely accessible form. Thus knowledge left a closed circuit around the ruling class. The Network Society adds computers and their derivatives to the three previous communication- and information orders, and accentuates aspects of availability and participation. With computerization The Network Society equals a knowledge-society that is not controlled by authors or authorities, but accessible and possible to re-write within almost unlimited networks available to everyone who has Internet.

This was a very short resumé of Baecker’s theory on the evolution of communication, information, and society. I hope that I have clarified that the Internet has transformed the diffusion of knowledge in a profound way. One of the main tasks of schools in late modern society is to disseminate knowledge. In addition to this, school is a part of the public sphere and school forms young people into citizens.

Internet challenges the idea of schools as the center for access to and dissemination of knowledge. What happens when Internet is something almost self-evident for most of the students, at least in their private sphere? They have access to amounts of
unlimited information via Internet and they use it for homework and for their presentations. What happens if schools cannot provide new ways of formatting knowledge that is more in accordance with this situation?

History – as a daily classroom practice

Unlike natural science (Naturwissenschaft) History being a part of the Humanities (Geisteswissenschaften) is not to a discipline mainly based on hard evidence but related to perspectives and interpretation. In accordance with this there can be no objective historical consciousness or any monolithic “History”. Although much ordinary ways of teaching and testing knowledge of history implies this. Instead I would argue that our historical truths and our conceptions of history are dependent upon national factors, power structures, cultural context, country of origin and socio-economical circumstances.

Teaching history is influenced by both explicit and unwritten rules and conventions concerning what to consider as valid as “Our History”. These norms are established through the curricula and by commissions believing in the necessity of one common historical consciousness (Heuer 2011:7ff).

On the other hand, in recent years education plans has shifted towards what nowadays is called “key competences of lifelong learning” (Bosse 2009:22). In a knowledge-based Network-society the key competences that shape knowledge, skills and attitudes appropriate in relation to different contexts, in which students can apply their gained knowledge, must be understood in plural and as dynamic. Therefore historical learning should be related to the different life world (lebenswelt) of the students (Husserl 2012:74ff).

If we look at different learning tools in relation to this we can contend that an ordinary textbook in History depends on certain assumptions. Firstly it develops a narrative of a national history. Secondly it focuses on different methods specific for historical learning. Thirdly it subconsciously reflects an idea of a world
history and historical progress created during the 18th century in Europe. All these assumptions constitute the basis also for today’s historical teaching and learning and neglect the demands of the 21st century that are neither Western nor accessible through history textbooks. Here are some of the reasons for rethinking the traditional views on history teaching.

- Students in schools of today have a variety of backgrounds that are not represented in the history textbooks.
- The Internet diffuses historical knowledge.
- No access to the Internet in the classroom backs every form of conventional historical learning.
- The methodology used in the textbooks varies and forms of historical learning that has no obvious effect on the historical content.

What we should do in relation to our contemporary context is to acknowledge the idea that historical consciousness and what is considered as acclaimed narratives always frame historical knowledge. This means that there is not one history, only histories in plural. Mathematics or science may not differ that much in relation to where it is taught while History is much more dependent on the national context. Thus Chinese, South Korean, or Brazilian students learn very different things about their past than the German or French students do. What does this mean for students with let’s say a Turkish background residing in a German history class? How can their lebenswelt and their family background be acknowledged as an important part of learning History?

There are other changes in the present Network Society that effect how History is or should be taught. Traditionally historical learning has been linked to studies of documents and historians who often use archives to find material for reconstructing events and developments in the past. Nowadays historical textbooks only offer a limited selection of preconceived documents and
sources. Instead excerpts, pictures and diagrams dominate. At the same time there are many archives available online. Internet creates access to numerous documents and sources, online archives, speeches, lectures, propaganda films etc. And the best thing is that there are no boundaries of nation, country or language. Instead Internet offers an unlimited amount of documents and sources that students can access and use.

These kinds of reflections have been fundamental to my approach to using iPad in the classroom over the last two years. My main focus during this period has been on the application of certain apps (Voice message, iMovie, Comic Life) and to use iPad as a tool to access and create knowledge that can exceed and even replace the historical textbook.

Four areas to work with iPad in

To me iPad has played a central role in my history classes in relation to the following four areas.

- Regional History
- Personal history
- Archive work
- Alternative documents and sources

Regional History

One way to open up history and make this school subject more relevant to the students is by studying regional history. Regional history is normally not included in historical textbooks but in one of my classes we worked on creating and presenting a classroom museum about the history of Kassel by using different forms of regional documents and sources. Instead of studying the “big history” we started with famous buildings in Kassel, the structure of the city, social implications of industrialization, different neighbourhoods, famous people in our town etc. The aim was to find out how the city had developed over the last three
hundred years and how we can find traces of this in our own town.

**Personal history**

On several other occasions we were looking for different and also personally connected perspectives on one historical period. For example when we studied the Second World War we asked the students about what happened in the countries from where their families originate. This perspectives lead to numerous questions and observations. Was fascism only a German matter? What was the result of the Second World War for other countries? In which way did the war (before and after) lead to new alliances between different countries and parts of the world?

**Archive work**

We went to online archives to study how Hitler came into power. For example, the students researched what the newspapers wrote the days before Hitler came into power in 1933. The idea was to uncover what ordinary Germans knew at that time, what they were informed about and what they may have discussed. The students were surprised to find out that Hitler’s activities were not particularly discussed in the newspapers the days before his “Machtübernahme”. Hereby the students realized that Hitler’s takeover came rather as a surprise.

**Alternative documents**

Alternative documents and sources were used on many occasions. In particular video material played a central role in lectures and as documentations of speeches, propaganda material etc. In each case such documents or sources were studied critically and not used as objective “information”.

**Reflections**

To sum up, the iPads were used constantly in the classroom without changing the individual work of each student, to trans-
form the gained knowledge in articles, critical observations, role-
playing etc. On different occasions we tried to produce films,
interviews, stories and presentations with the help of the apps
mentioned above. Still the application of iPad and apps in teach-
ing and learning history was less successful than expected, and
producing material with iPad is very time-consuming and stu-
dents in general evaluate their work as too time-consuming in
relation to the results of their works (History is normally taught
in two or three lessons per week).

The appropriation of knowledge in the fields here mentioned
changed the content and the way of learning. With the iPad
students could work more freely and efficient. By emphasizing
the historical consciousness and by becoming aware of history as
a narrative the students started to deal with historical matters
differently. History no longer appeared as a process of learning
“pure facts” but rather showed that facts achieve meaning in a
particular context.

Furthermore, history was seen as something that is not an ob-
ject but something the students themselves are involved in. By
learning different perspectives not in terms of pro and con, lib-
eral or conservative, but in terms of how the experience of his-
tory depend on where you are, and how your judgments changes
when you try to understand how people reasoned in their time-
space-capsule. Then history no longer equals a long story of a
nation that may be of little relevance to the student.

Living in *The Network Society* means that knowledge has be-
come accessible through the Internet. Here iPads can become a
link between the knowledge that is accessible online and in the
classroom. In this regard iPads are a necessary tool for students
if they are to become learners inside and critical citizens in the
*The Network Society*. Finally one more major statement should
be made. When working with iPad or Internet the teacher
should make a clear distinction between:

- Information-Knowledge
• Research-Gaining knowledge

Information is short-term-based without real learning effect so in the classroom teachers should be aware of the idea of “looking for information” or “doing research”. This can be contra-productive and lead to “learning without learning”. Instead Internet should, as already mentioned, be used to find information that goes beyond the textbook. Even so the students must still write when they are taking notes, writing articles or doing critical assessments. I think that hand-writing is a necessary process in developing a personal way of repeating, learning and evaluating. And this is something that the electronic forms cannot replace. It must also be said that, to work continuously and in a sustainable way with iPad, it is necessary that very student have his/her own device.

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12. Conclusions and some advice to teacher education

Michael Forsman & Ted Weisberg

This report has presented the story of the method advancement project Paducation financed through the EU program Comenius Regio. In this report several voices from within the project have shared their experiences and reflected on the possibilities and challenges that iPad have brought to their teaching. As already mentioned the project name Paducation is an alliteration to Education. So what can Education learn from Paducation?

In our respective capacities as project manager and external researcher/observer we will here try to synthetize some of the major outcomes and offer some advice to others who are about to enter the iPad route and the landscape of 1:1. In this we also address those responsible and engaged in teacher education. We have organized our advisory in two parts. First Ted will summarize the project from his perspective. Then Michael offers some conclusions and reflections.

Bridging the Digital Gap (Ted)

As the project manager in Sweden I had the opportunity already at an early stage of the Paducation project to present a paper about the project at the 6th International Conference of Education, Research and Innovation (18–20 November in Seville, Spain).\(^1\) I wrote this paper together with Andreas Rehner who

\(^1\) http://iated.org/iceri2013/download, June 5 2015.
was essential in planning the project and in its upstart. In our paper we wrote the following.

We are attempting to develop the iPad as a teaching tool in secondary schools. We hope to gain insight in how to train teachers to utilize the opportunities available with this digital revolution. We want to create a method to shrink the digital gap. Our goal is to help pave the way for teacher training institutions to take on this challenge. We know that we must face obstacles in our work on a daily basis. We need to crack some of our own codes in order to cross the digital divide. Our intention is for Paducation to be a contribution in this process.

Now after Paducation I can say that our thesis that *iPad could be an innovative tool to dynamically alter the way of teaching* turned out to be true. We can even state that the intuitive nature of iPad contributed to a successful learning process for many members of the Paducation group who did not consider themselves digitally skilled before the project.

We can also state *the value of a collaborative method and cross-national activity*. The teachers that were part of Paducation found our working methods stimulating and helpful in their efforts to learn more about how to use the iPad in lessons.

*Documentation has been an important part of our work.* We have earlier mentioned the ambitious amount of video recordings we did. Every workshop was also summarized in notes taken by project manager Angelika Jaenicke. These memorandums have been detailed and of lasting value to help recall the important contributions that were made at these events. To have this documentation was vital since the workshops had such a central role in the project.

We all agree that *having a partner teacher* has been extremely helpful, and the Lichtenberg group acknowledges that input from another system helps you to reflect on your own system and situation.
At the same time we must admit that there was less contact between partners than we had hoped for from the beginning. The workshops generated contact before and after but the blogging in-between workshops were not that extensive. It is no news that cross-national contact can be difficult to uphold on a continuous basis, when there are too many other responsibilities competing for the teachers’ attention. Even so there were a couple of projects that came out of the workshops. For example the project that Arts teachers Ylva Sanner at Rudbeck and Martin Fiola at Lichtenberg did as an online collaboration between their students (see Ch. 7). This kind of collaborative method development was something that we had not dared to hope would happen until after the project but here it was incorporate already during the second year.

The German unit of the Paducaiton group initiated “A Pedagogical Day” designated to make all teachers in Lichtenberg Schule better orientated with the possibilities of using iPad in the teaching of lessons, and this together with the general activates and energy of the group influenced the new headmaster who is more open to the idea of shifting to a 1:1 environment in the near future, despite many obstacles within the educational structure of Kassel. Another good result for the project was that the development at Rudbeck functioned as a positive support and inspiration for the teachers at Lichtenberg.

What also can be learned from Rudbeck is the importance of having both relevant and sufficient technology (enough iPads) and the right technological/pedagogical support. Rudbeck is blessed with having two ICT-technicians/ IT pedagogues (Torbjörn Jonsson and Tony Holm) who are able to combine their technological expertise with a genuine and open-minded pedagogical interest. Rudbeck also has an IT coordinator (Lars Glimbert) who has worked hard with the implementation of 1:1 at Rudbeck. In the Lichtenberg group Thomas Maxara was “the battery guy” and he gave both technological support and energy to his colleagues. Thomas also took on the role of being the
webb- and blog-master in the project. So one of our main insights after two years in the project is that you must make sure that you have qualified support available on a daily basis. Someone from the IT team at Rudbeck was always available to go to for help, which was especially important in the beginning of the project. As teachers began to learn more about the possibilities and went deeper into the world of apps they came up with more complex and intricate questions to ask, and at the same time they themselves became more qualified and could thus help each other out. A new reform to elevate the status for teachers had also an affect on the Rudbeck group.

The lack of time to work with the project was one of the biggest problems for the project as a whole. It was very difficult to organize meetings and to follow-up on agreed-upon tasks due to all teaching and other work obligations during and after lesson hours. In neither of the schools were there any reductions in teaching time to compensate for competence development. It was a struggle even to get the groups together for the workshops.

In 2013 the EU Commission introduced two new initiatives on the Internet, Open Education Europa and Digital Agenda for Europe 2020. Androulla Vassiliou sent this message to all member states.

The education landscape is changing dramatically, from school to university and beyond: open technology-based education will soon be a ‘must have’, not just a ‘good-to-have’, for all ages. We need to do more to ensure that young people especially are equipped with the digital skills they need for their future. It’s not enough to understand how to use an app or program; we need youngsters who can create their own programs. Opening up

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2 Several members in the Rudbeck group became “First Teachers” during the Paducation-project. Becoming a First Teacher means that you get a pay raise and added responsibilities. In hindsight it is obvious that their participation in Paducation was a plus for them when applying for this promotion. The backside was that the promotion even lessened the time they had available for meetings and seminars in the group.
Education is about opening minds to new learning methods so that our people are more employable, creative, innovative and entrepreneurial.\(^3\)

If this is to happen politicians, principals, teacher unions and others talking about closing the digital gap and developing new skills must understand that in order to make this possible there is a huge need for method advancement projects such as Paducaction. Teachers must be given a proper conducive environment to deal with the transformation of their role as teachers in the new digitalized education. One example of this was a seminar held at Rudbeck as competence-elevating workshops for the entire faculty where Abdul Chohan, from the ESSA Academy in Bolten England,\(^4\) introduced \textit{iTunes U} to us. This was a great inspiration to many in the Swedish group. We witnessed how this app, which is conducive to iPad, could be the key we were looking for to open the door for structured methods to transform the way we can organize the curriculum in a course.

This also invited teachers to work in a collaborative manner when creating such a course. (c.f. ch. 8.) Still it took us at Rudbeck to the end of the final year before we could have our own workshop with \textit{iTunes U} (led by Linda Larsson).\(^5\) I am convinced that this is the way to go, and of course to have 1:1 environments is almost necessary for this to become really effective.

So this is a message to all institutions with teacher education: \textit{iTunes U} in combination with iPads should be required courses in all disciplines! That way the future teachers can learn how to flip the classroom, create transparency and specific fair and equal curriculums for students. It will also increase their ability

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\(^4\) Abdul Chohan, Essa Academy – Learning Without Frontiers (YouTube), https://www.youtube.com/watch?v=EARTcJkNnDA, download, June 1 2015.

to take more responsibility and initiative in their education. This is one of the most important lessons from the Paducation project and we want to pass it on to all who are engaged in upgrading education to meet the digital challenge of today and in the future.

Institutional and interactional aspects (Michael)

Having been one of two evaluators and observers of the Paducation project the following is my overreaching conclusion. Here are three major areas to consider.

First of all it is of great importance that the chosen technology really functions as expected, and that it is well synchronized with the networks and platforms that the school uses. You also need to have the relevant technological support from personnel that understand both the theoretical and practical implications of the pedagogical model applied when implementing iPad. The German group was confronted with some problems due to the fact that Lichtenberg in general had a relatively low technological level. At Rudbeck there were instead reoccurring problems with not having a well functioning correspondence between the iPad armada and the platforms and networks that the schools had contracted.

Secondly you need well thought models (and the right material and human resources) for this kind of in service training. This should not be limited to mandatory and general courses. It is important that principals and others also support formats, forums and practices initiated by the teachers themselves where they can focus on authentic and case-based material. Like in the concept of Show n’ Tell that was used in the Paducation project to exhibited different apps and learning scenarios. This is something to recommend, in combination with collective and authentic problem solving. One such example could be a commission to create teaching material such as E-books together, maybe by the use of iBook (c.f. ch. 8).
Thirdly and maybe most important, to increase the likelihood of longevity and a sustainability of a development projects implementing iPad and 1:1, such a venture must be linked to a long-term pedagogical project. When the Paducation project started Rudbeck was already in the midst of a pedagogical transition from summative to a more formative system for evaluation where continuous feedback and ongoing dialogue with the students is at core (c.f. ch, 9).

This sort of pedagogical thinking is often brought forward with reference to John Hattie, a pedagogical researcher, originating from New Zealand but presently working in Australia. Hatti became known worldwide with his books Visible Learning (2009) and Visible Learning for Teachers (2012). Here Hattie has made synthesis of more than 800 meta-analyses involving millions of students and representing the largest collection of evidence-based research about what it is that improves learning. He ranks 138 aspects that he states are of importance for students’ learning. One of his conclusions from doing this is that problem-based learning strongly related to real life issues has a very positive effect. Here the teacher becomes more of a coach than the central figure, as the students are stimulated to seek and create their own information. Hatties thesis is that this kind of teaching is positive for development of critical thinking, experimental work, and abilities to actually apply your knowledge. Here iPad and net-based learning resources and collaborative groups and problem-based learning seem to be on target together with individualized technologies such as iPad.

According to critics, the models that Hattie and the likes offer, goes well both with neoliberal individualism and a culture based on efficiency, productivity, measurements, comparisons, competition and self-monitoring with the help of an individualized technological system.

On the level of individual and intersubjective practices and relations, it is important to have teachers that are curious, and open to reflect on, and even somewhat remake their own teach-
ing style (Pratt 2002). This means going from being the “broadcaster” up front, to become more of a coach, collaborator, commenter and organizer of learning processes. I would argue that this changing role of the teacher is partly determined by the prevailing trend, at least in Sweden, to the shift to 1:1. This should be accompanied by a collective procedure where groups of teachers that are part of such a change are given incitement and motivation to share and reflect on this process. Here I think that the Paducation-project can function as one model for how such work can be organized.

By bringing iPad and Internet into the classroom the space for learning becomes somewhat redefined. This also has consequences for ideas about the teacher, teaching, legitimate sources to use etc. With iPad and other multimodal technologies you open up the space for learning to other forms of representation of knowledge and this demands a discussion around how to evaluate “the signs” of knowledge (c.f. Kress 2010).

With iPad you become more dependent on visual aspects of production, dissemination and evaluation of knowledge. With this follows new demands for the institution and its inhabitants, which means a challenge and potential conflict between prevailing practices and discourses and the new possibilities that the technology open up. As several of the contributors in this report have shown, iPad give possibilities to work more with “learning by doing” and explorative work in the immediate surroundings of the school, as well as online activities and integration with other countries, languages etc. Another aspect, with implications for the traditional organization of any subject curriculum and ideas of learning outcomes, is that iPad in combo with Internet comes out at its best when it is related to thematic cross-overs between different school subjects (and with that, collaboration between teachers) as well as a lot of participation from students, who already live with spreadable and participatory media on a daily basis (Jenkins 2006, 2013) and with increasingly blurred lines between online/offline; what Turkle (2011) calls “The teth-
ered self”. The tethered self can also be related to ubiquitous learning, i.e. learning that can take place anywhere, anytime, all the time (Cope & Kalantzis 2009).

Obviously there is a lot to learn from the very engaged Paducation group. The project shows the importance of well-structured engagement on the micro-level and the possibilities that comes with a well-thought exchange project. Still I would like to finish by taking a step back from the teachers at Rudbeck and Lichtenberg and leave you with some wider reflections about iPad and 1:1 in relation to teacher education.

In relation to teacher education one important question is what is it that teachers of tomorrow need to know? This also leads to the question what teacher education should offer. I think that the actual use of different forms of information and communication technology (ICT) is of great importance but I would also argue that the main thing is not to buy hundreds of iPads but rather to start a more reflective process about what happens to teachers, teaching and learning in a time like ours where schools become more and more mediatized (Breiter 2014) and here digitalization is just one dimension.

Mediatization is a meta-concept (c.f. globalization, individualization, urbanization) that refers to an irreversible, universal and differentiated process with three main characteristics: media is becoming more autonomous, media technologies are more and more present in and defining to all sorts of situations and we act and think more in accordance with media logics. Thus the mediatization-concept refers to a meta-process where all parts of society have become inflicted and saturated by media. Some even say “everything is media” or “media is everywhere” (Deuze 2012). In relation to school you can find this on many levels. On a micro level both students and teachers bring their media skills, habits, memories, references, to school and use them as natural ingredients and references in teaching and learning (this was not the case a couple of decades ago when audiovisual media with spaces outside the school environment could appear as a
threat to more formal learning). On a macro level we have for example the ongoing ventures with 1:1.

Looking back it is easy to see that schools always have been “media spaces” (c.f. Couldry & McCarthy 2004). It is just not possible to store, disseminate and evaluate knowledge and learning without using of some sort of media technology (from books, blackboards, pen and paper to digital devices.). Traditionally the media ecology of schools has privileged the alphabet, books, and “typographic man” (McLuhan 1962) whereas citizens breaded by the current school system dwell in a globalized online/offline world with smart phones, internet, and social media (Forsman 2014, Boyd 2014). If the students’ skills in information technology surpass those of the teachers’ the school’s task of reproducing knowledge and common principles over generations is thoroughly challenged (Bourdieu & Passeron 1990). The ongoing digitalization of school has also been compared with earlier shifts in the history of literacy (Goody & Watt 1963) and the implied consequences for schooling appear to be significant.

This discussion not only concerns the utilities of different digital devices but also questions about school as being a determinant in the socialization of citizens for tomorrow. Recently questions of ICT and media literacy have been linked to issues of democracy, freedom of expression and source criticism (Mihailidis 2014). Often the concept “media and information literacy” (MIL) is used here. The necessity of adapting education to contemporary mediescapes has even been declared by international policy makers. As in UNESCO’s ongoing initiative “to introduce the media and information literacy components into teacher training curricula worldwide” in order to provide critical knowledge and analytical tools, empowering media consumers to function as autonomous and rational citizens (www.unesco.org). These guidelines from Unesco are presented in a “MIL-curriculum for teachers” (Wilson 2011 et.al.). This document has been transposed into Swedish policies and pedagogical thinking (Carlsson 2013, 2014) (not yet into German).
Simultaneously, central actors in the politico-economical field of education (municipalities, politicians, teachers unions) have initiated collaborations with major commercial media companies (such as Apple and Google) to increase the presence of information and communication technology (ICT) and “digital competence” in schools for example through ventures with 1:1 (Grönlund 2014) and implementation of cloud-services and E-learning (cf. SOU 2014:13). However, a recent report (Forsman/Statens medieråd 2014) argues that the fields of ICT and MIL in Sweden are marked by a lack of historical awareness, reflexivity, and independent research. Dominant agents tend to represent external organizations, media and ICT-companies or single entrepreneurs; preferred knowledge interests tend to be policy-oriented and shortsighted: applied models of media influence tend to shift between determinism (technology is the basis of all social change) and instrumentalism (technology is “in itself” neutral).

So what should teacher education do then? I would argue that the kind of reflective and critical perspective here presented is relevant but only credible in combination with efforts to actually incorporate “new technology” in teacher education. This should include using the technology that already is available as well as the abilities and ideas that teacher student might bring. It is also important that teacher education act in dialogue with the schools where the teacher students from the university do their practical apprenticeship since many of these schools (at least in Sweden) are much better equipped in terms of ICT than the universities.

To use iPad together with the apps and online systems can, as we have seen offer many opportunities to stimulate students and teachers in their work, due to the intuitiveness of the technology (touch screen, apps etc.). At the same time it is crucial not to stare yourself blind on the technology, nor to consider it as just a “new tool” to be used to work pretty much in the same way as before. The real challenge but also the possibility is to not get stuck in technological determinism and media-centristic think-
ing and precentism combined with technological naivism (this new technique will solve our problems). Nor should one be stuck in some sort of social determinism and the idea that media is an extension of man and that “technology is just a tool” (what really matters is the content, the contact, the pedagogical mission). Instead we should let technology affect practices and thoughts about teaching and learning in a profound way (c.f. Kittler 1990). Not necessarily in order to adjust all teaching to iPad and the likes. We must also become more aware of the global and commercial interest, and potential corporate take over of schooling, that Apple, Google and others represents here. All of this is important knowledge to have for the skilled and judicious teacher of the 21st century.

References
12. CONCLUSIONS AND SOME ADVICE


Appendix

1.1 Program: first workshop

Paducation – Challenge-based education in a digital environment

**First Workshop**

Tuesday, October 29th 2013, Open Channel Kassel

9:30 Paducation kickoff: Where are we now? Where will we be in two years?
11:00 Greetings and photo
Sabine Schäfer, State education authority and teachers academy/Public education authority for the county and the city of Kassel

Prof. Wolfgang Thaenert, Head of regulatory authority for commercial broadcasting in Hesse

11:30 Road map: timetable and structures
12:30 Lunch (Gleis 1)
14:00 Show n’ tell: useful experiences
15:30 Coffee break
15:45 Talk (Thomas Maxara): Blog
17:00 End of work
18:00 German “Grillfest”

Wednesday, October 30th 2013, Lichtenbergschule
10:00 Planning of cooperation: Partner teams
11:30 Coffee Break
12:00 Planning of cooperation: Partner teams and national teams (6th lesson)
13:30 Lunch (Mensa)
14:30 Media Day
15:00 Talk (Prof. Dr. Thissen)
16:00 iPad Photo Walk to World Heritage
   (Herkules and Bergpark Wilhelmshöhe)
18:38 ICE leaving Kassel
1.2 Program: second workshop

Paducation
Workshop #2
28/3 2014

Rudbecksskolan room B105

8:45 Opening remarks
- Anders Morin (fp), Chairman Sollentuna Education and Labor Market Board
- Per Frithiofson, Headmaster Rudbeck High School
- Karin Schmidt Bogard, Principal Social Studies & Estetics

9:00 Introduction to Workshop #2
- Ted Weisberg Nicole Malke-Harms, Angelika Jaenicke

9:15 Show & Tell

10:30 Coffee break

10:45 Paducation blog “The Good, the bad and the ugly”

11:15 Partner tours of Rudbeck

12:00 Lunch

12:45 Group photo-school yard
13:00  iPad and the impact on teaching and learning-Next steps
       - Andreas Rehner  German School
         Madrid Spain

13:45  Small group discussions

14:15  Plenum summary

14:30  What’s BFL (Assessment for learning) got to do with it?
       Anna Oldner Bengtsson & Peter Sandberg

15:00  Coffee break

15:15  Mobile learning scenarios - Nicole Malke-Harms
       Evaluating Paducation - Michael Forsman Södertorn University

16:00  New goals, new commitments, next workshop

16:30  Promenade to Edsvik Art Gallery

17:00  Art and Mingle - Exhibition “Note Bene”
       with dinner & beverages

20:00  Stockholm by night (Voluntary)
1.3 Program: third workshop

Päducation – Challenge-based education in a digital environment

Third Workshop

Thursday, October 2nd 2014, Lichtenbergschule

9:00 Greetings:
Klaus Riedel, Head of Lichtenbergschule

9:45 Partner tours to lessons and to Lichtenberg-surroundings

11:30 Show ‘n’ tell – part 1 (best practice related to specific subjects)

12:30 Lunch (Mensa)

13:30 Show ‘n’ tell – part 2 (best practice related to specific subjects and summary for part 3)

15:00 Coffee break

15:30 Show ‘n’ tell – part 3 (best practice in plenary session – deficiency, needs)
17:00 End of work
18:00 Banquet between gate guards and vineyard

Friday, October 3rd 2014, Open Channel Kassel

9:00 Road map: timetable and next steps
9.30 Andreas Hofmann gives a lecture on “mobiles lernen-21”,
   a statewide project in Lower Saxony
10:30 Questions upon questions – and answers
11:00 Michael Forsman and Oliver Emde: What we found out to date
12:00 Lunch (Open channel catered by Gleis 1)
13:00 iPad Photo-/Videowalk to “documenta hangover”
15:00 Short break in Open channel with fika and last appointments
16:10/16:38 CANTUS leaving KulturBahnhof/ICE leaving Kassel
1.4 Program: fourth workshop

**Päducation Workshop #4**

**23/4 2015**

Education & Labor Market board offices 2nd floor
City Hall Sollentuna

9:00 **Opening remarks**
– Helene Bengtson – Sollentuna School Authority
– Anders Morin (fp), Chairman Education and Labor Market Board
– Eckhard Müller – Principal Math & Science Lichtenberg Schule
– Per Frithiofson, Headmaster
Rudbecks Gymnasium

9:20 **Introduction to Workshop #4**
– Rapport from Lichtenberg – Nicole Mahlke-Harms
Pädagogischer Tag – Digital heroes
– Rapport from Rudbeck-Ted Weisberg
– iTunes U – ETER

9:50 – Short break

10:00 **Guest Speaker**
Kristina Björn, educational strategist
– iPads in Sweden  Breakdowns, Breakthroughs and Beyond
– Discussion

11:00  Promenade to Edsvik Art Gallery

11:30  Guided tour of student exhibition IDENTITY

12:00  Lunch

12:45  Group photo-school yard
       Rudbeck Room B105

13:00  Show ‘n’ tell – small groups

15:00  Coffee break

15:15  Challenged based learning –
       Anna Oldner Bengtsson

16:00  Summary

19:00  Restaurant Patricia Söder Mälarstrand, Kajplats
       19, Stockholm
Paducation Workshop #4

24/4 2015

Rudbeck
Room B105

8.30 Presentation day 2 with coffee

9:00 Classroom visits

10:30 Plenum session
– Feedback from lesson observations

11:00 Life after Paducation
– Sustainability – how do we continue?
– Final conference in Kassel 24/6 – Angelika Jaenicke
– Regional conference Södertorn University Fall 2015

11:45 Lunch

13:00 Evaluation rapport – Michael Forsman & Olli Emde
– Presentation of outline
– Data from focus groups
– Conduct follow-up survey
– Discuss project members contributions

15:30 Declaration of Intent
– Video message Klaus Riedel Headmaster
Lichtenberg Schule
– Signing of Document for future cooperation
  Rudbecksskolan – Georg-Christoph-
Lichtenberg-Schule

16:00 Closing comments

Paducation Workshop #4
25/4 2015
Social and cultural activity

– Boat tours
– Museums
– Culture night Stockholm
2. Questionnaire (I and II)

Underlag för utvärdering Paducation / Basis zur Evaluation von Paducation

Enkät som fylls i vid den första och sista workshopen i projekten
Umfrage, die im Rahmen des ersten und letzten Workshops ausgefüllt werden soll

1. Vilken skola arbetar du i? / An welcher Schule arbeitest du?

☐ Rudbecks gymnasiet ☐ Lichtenberg-Schule

2. Vilka ser du som de tre främsta fördelarna med att använda Ipad i din undervisning? / Welches sind aus seiner Sicht die drei bedeutendsten Vorteile des iPad-Einsatzes in deinem Unterricht?

☐ Eleverna blir bättre på att själva söka information
Die Schuler werden besser darin selbst Informationen zu suchen.

☐ Det ökar elevernas studiemotivation
Es steigert die Motivation der Schüler zu lernen.

☐ Det gör undervisningens mer tidseffektiv
Die Unterrichtszeit wird effektiver genutzt.
Eleverna kan ta del av mer information
Die Schüler können auf mehr Informationen zugreifen.

Det blir lättare att arbeta papperslöст
Es wird leichter "papierfrei" zu arbeiten.

Det är en bra hjälp för barn med funktionshindrar (dyslexi etc.)
Es ist eine große Hilfe für Kinder mit Lernschwächen (z.B. LRS).

Det är en bra hjälp för barn med språksvårigheter.
Es ist eine große Hilfe für Kinder mit Sprachschwierigkeiten.

Eleverna lär av varandra
Die Schüler lernen voneinander.

3. Ange två huvudproblem som du tror kan uppstå om alla elever har Ipads i klassrummet. / Gibt zwei Hauptprobleme an, die deiner Meinung nach entstehen können, wenn alle Schüler iPads im Klassenraum benutzen.

Eleverna gör annat (spelar, surfar, mailar etc.)
Die Schüler machen etwas anderes (spielen, im Internet surfen, mailen etc.)

Det stör koncentrationen i klassrummet
(spring etc.)
Die Konzentration wird gestört (durch Herumlaufen etc.)
Det blir svårare att hålla en röd tråd i undervisningen
Es wird schwieriger im Unterricht den "roten Faden" zu finden

Det blir oklart vem som leder undervisningen
Es wird unklar, wer den Unterricht leitet

Tekniken krånglar
Die Technik funktioniert nicht zuverlässig

4. Välj ett av nedanstående alternativ, som du anser bäst anger din nuvarande kunskapsnivå vad gäller användning av dator (ipad, laptop etc.) i din undervisning
Wähle eine der untenstehenden Aussagen, die deinen momentanen Kenntnisstand, was die Nutzung von Computern (iPads, Laptops etc.) im Unterricht betrifft, am besten beschreibt.

Hög nivå (kan utveckla mitt arbete och även hjälpa andra)
Hohes Niveau (Ich kann meine Arbeit entwickeln und sogar anderen helfen)

Tillräcklig nivå (klarar mina sysslor)
Zufriedenstellendes Niveau (Bewältige meine Aufgaben)

Bristfällig nivå (måste ofta fråga, blir ofta fel)
Mangelhaftes Niveau (Ich muss oft fragen und mache vieles falsch)
☐ Inga kunskaper (vet knappt vad detta handlar om)
Keine Kenntnisse (Ich weiß kaum worum es geht)

Kommentar ..........................................................................................................................................

5. Vilka av E-resurser använder du oftast tillsammans med eleverna i klassrummet? / Welche digitalen Quellen wendest du am häufigsten zusammen mit den Schulern in der Schule an?
.....................................................................................................................................................................

6. Inom vilka av följande områden använder du idag dator (Ipad) i klassrummet? / Auf welchen der folgenden Gebiete wendest du heute Computer (iPads) im Klassenraum an?

☐ Genomgångar / Prüfungen
☐ Examinationer / Untersuchungen
☐ Sök / Recherche
☐ Övningar / Übungen
☐ Presentationer / Präsentationen

7. Vilka appar för Ipad använder du mest? / Welche Apps für das iPad benutzen du am meisten?
8. What do you consider to be the main advantages and disadvantages with Ipad?

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<th>Advantages</th>
<th>Disadvantages</th>
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9. What has been your three main strategies when learning how to handle your Ipad?

- [ ] Following instructions online
- [ ] Personal trial and error
- [ ] Asking colleagues
- [ ] Asking students
- [ ] The Paducation-workshops
- [ ] Other

10. What are the main learning outcomes for you as a teacher after taking part in the Paducation-project?


11. What would be your main advices to other schools, teachers planning to use Ipad?
12. What do you think Teacher Education can learn from the Paducation-project?

13. List three things you rather do with your desktop device than with your iPad

14. What topics would you prefer for further teacher training. What have you missed so far?

15. Please list the three most important points for a curricular for iPad-education
3A Focus-group: Interviews Kassel

**1 topic**

**How does the use of iPads affect the teacher’s way of organizing their daily work and the preparation of their lessons?**

- First part is about preparing lessons with the ipad -

  **A)** How do you use the ipad for preparing your lessons?
  - Changings through using the ipad for lessons?
  - Is your preparation more efficient by using the ipad?
  - What for do you use the ipad for – very concrete? What function does the ipad have in your preps?

  **B)** What problems do you have in preparing lessons with ipads?
  - Which tools are you missing?

  **C)** Do you use the ipad for communication with students outside the classroom?
  - Are there any changings in the communication using ipads?

**2 topic**

**How does the use of iPads affect their actual way of teaching?**

Second part of the interview is focused on the way of teaching with iPads in classes:

  **A)** Describe exactly how you use the ipad in class. Describe a situation in which you as a teacher use the ipad
in a specific didactic way. Which functions has the ipad in this situation?
- What different kind of usages are existing? Can you group the different usages in categories?

B) If students use ipads in classes – how does it work? Describe the way of work and the function of the technical device.
- What are the (didactic-)goals of using ipads in the described situation?
- Which (social) skills are promoted by using ipads?

C) What are the important changes using ipads in classes compared with other methods?
- What are the main advantages?
- You have a lot of new possibilities using technical devices. Which possibilities would you miss most without ipads?
- What are your experiences: Does the use of iPads change the proportion of knowledge and information through using iPads?
- What about instructions and construction?
- How does the ipad promotes initiative and independent learning? What are the differences to other methods?

D) How does the relation between teachers and students change through using ipads in classes?
- How does the teacher’s role change?

E) What is the most important problem using iPads. On of the most crossed answers in the questionary at the beginning of the project was „Students doing other things in classes with the ipad.“ (STIMULA)
- What are your experiences with that issue?
- How do you solve this problem?
3 topic
How do teachers organize their own learning processes with the ipad? What is needed to improve these learning processes?

Third part of the interview is focused on you self-organized learning processes:

A) How does self-organized learning and qualification of teachers work?
   - How do you organize your self-learning-process in school?
   - What kind of structure do you use in your school?

B) Is there a change in communication between teachers through the usage of ipads in school?
   - What about the communication in your paducation-group?
   - Do you have more conversations with teachers of other subjects through the ipad?

C) What are the ways of solving problems? Who is your contact in that case?
   - What are the main topics/problems (didactics/methods, subject, technical)?

D) What about the significance of learning with ipads in your school in general?
   - What are the reactions of your colleagues
   - What about the school management?

E) What would teachers need to increase self-organized learning processes?
   - Is there more communication between teachers through the usage of ipads in school?
3.B Focus Groups: Rudbeck

Fokusgruppintervju Rudbeck

22.11 + 16.12

Moderator: Michael Forsman


2. Vad skulle ni säga är de största fördelarna för er som lärare i att använda Ipad?

3. Vilka reaktioner har ni fått på att ni använder Ipad från elever och kollegor?

4. Hur har det gått till för er att lära er använda Ipad?

5. Vad skulle ni säga är det det bästa sättet för lärare som ska börja använda Ipad att lära sig att komma igång med dem i klassrummet (formell fortbildning, kollegialt lärande, eget lärande)?
The Paducation project involved teachers representing a variety of disciplines from two upper-secondary schools in Germany and Sweden. The teachers used iPad on a daily basis to explore and evaluate the possibilities and challenges that this technology could bring to their profession.

The use of iPad was discussed in relation to different knowledge cultures and subject traditions. Collaborative work within and between the two groups took place offline in workshops and online through a mutual blog.

This report describes different aspects of the project and the process that unfolded including eight articles written by project participants. The report also presents some over-reaching outcomes from the project as well as some critical thoughts.

The findings are a compelling read for anyone engaged in teaching or teacher education providing practical know-how and should be read in relation to the on-going digitalization of education.