UBIKO

inspiring learning

INSPIRED AND SUCCESSFUL LEARNING

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UBIKO IN PRACTICE

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2013

Published in In Juuso, H, Lindh, A., Hasari, M., Kumpulainen, K., Lapinoja, K.-P., Pirilä, P., Raappana, S. & Tiainen, O. (Eds), Tutkimusperustaisuus koulussa ja opettajankoulutuksessa. (pp. 90-99). Oulu: Oulun yliopisto, Oulun normaalikoulu.

Inspired and successful learning - UBIKO in practice

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The UBIKO project has changed the daily routine of the pupils and teachers involved in many ways. Even if many good objectives were not yet achieved, several new learning methods and practices were discovered that we wish to maintain, develop and improve. In this article I will describe and assess the various changes brought on by UBIKO and how the project has improved learning from the point of view of an individual teacher who has been involved with the project from the outset. First I will describe how experienced teachers with extensive substance competence implemented team teaching and shared expertise, followed by a description of the 'sibling groups' consisting of pupils from different classes. UBIKO involves plenty of visible changes in the school unit that immediately draw attention to themselves, such as the decor, new furniture, acoustics, mobile devices and new presentation tools. Pupils do not always work at their desk; rather, they may often lie on the floor or crouch with their heads together in all kinds of places. Attention is paid to self-regulated learning, learning objectives and related assessment during nearly all lessons. Pupils complete self-reflection activities on learning and share their work on mobile devices using social media tools. They can create ebooks, digital stories, films and keynotes both independently and collaboratively. The scientific background of the UBIKO project is described in another article by Researcher Heikki Kontturi.

Keywords: self-regulated learning, ubiquitous learning, mobile learning, iPads in teaching, team teaching

Changes in children's world

During my 50-year school career, children's world has changed "from a desert to a jungle". Without commenting on all underlying factors and related challenges we wished to increase children's enthusiasm towards school and learning by taking advantage of, for example, the world of gaming, which the children appear to enjoy even a little too much. After all, learning takes place ubiquitously. In UBIKO we wished to find modern pedagogical methods for encouraging children to actively observe and perceive when and how they learn.

Below is a description of studying in an UBIKO unit by our teacher trainee Tiia Hautasaari:
I completed my teacher traineeship in the Kirppa unit, which was part of the UBIKO project. The UBIKO project is funded by the Finnish National Board of Education and it studies pupils' individual learning processes and how those are affected by technology and the environment. Its goal is to foster pupils' meta-level understanding of their learning processes. Teachers present the pupils with a problem which they then strive to solve themselves. Afterwards the pupils strive to understand how they learned the matters in question. Each pupil is seen as an individual who learns things in their own way. In short, the project studies knowledgeable learning. It strives to revise the curriculum to better take into consideration the unique characteristics of each student in terms of learning and the individual experience of learning; there should be more personalised teaching practices for each pupil. In general, the pedagogical practices at the Oulu University Teacher Training School are based on dialogue, interaction, collaborative learning, constructivism and the situational nature of knowledge. Learning stems from the pupils themselves rather than from direction provided by teachers. In addition to the issues stated above, in my mind the teacher's role as instructor was evident in every school subject. I am glad to receive teaching in this pedagogy. The teaching I received in comprehensive school was very different – teacher-driven, assignment-oriented and completely lacking in dialogicality.

TEAM TEACHING

Traditionally teachers work in their classroom alone, behind closed doors. Neighbouring classes may be working on the same topics and projects, but each teacher finds the required tools and materials as well as prepares the assignments separately without knowing that the class next door could be working on the same topic. Only at the end of the project do they find out that the other teacher has noticed some different, intriguing aspect about the topic at hand that could have been very helpful to know in the beginning of the project. The teachers of our unit are all extremely well versed in their subjects in a wide range of ways. Each teacher was particularly highly specialised in one or more of the subjects; two even had doctorates in the field. Others were otherwise experienced and distinguished in such fields as music and religion, biology, entomology and school camp activities, mathematical subjects, computer engineering, and entrepreneurship education. They all had at least twenty years of teaching experience. Since we felt that we would have much to benefit and to learn from our colleagues, we were prepared to work hard to improve teamwork. We had provided peer support and trained each other even before the project, but UBIKO allowed us to turn this into a methodical practice.

We immediately formed a UBIKO core group that convened as often as once a week to plan the project. We decided to split the project into a UBIKO pilot to be completed in spring 201 and four subprojects to be completed during academic year 2012–2013. Before each subproject we held a joint planning session, followed by an assessment session at the end. The latter was organised by Sirpa Kova and her colleagues from the Learning and Research Services of the University of Oulu. Focus areas were selected jointly for each UBIKO subproject period from among the project objectives. We were constantly aware that the project itself had too many objectives, but that by dividing and scheduling them into appropriate sub-objectives we could achieve some good results.

We also formed grade-specific teams to implement long-term learning projects that would enable self-regulation in practice. At first it was easiest to find common subject proficiencies in mathematics, which resulted in us arranging special mathematics theme days throughout the project. Pupils were divided into small ‘sibling groups’, each of which included pupils from the parallel classes. We provided 4–6 learning stations that the pupils toured, completing activities to gain points in their ‘math passes’. The stations were activity-centric, utilising a wide range of learning aids and math games on mobile devices rather than textbooks and notebooks. We organised joint steering, planning and assessment sessions and spent a lot of time and effort to make the learning sessions pedagogically meaningful. During the project we also discovered many mathematical games and activities that in themselves guided and motivated the pupils. These can be used in subsequent workshops with less advance preparation. The mathematics theme days received only superlative feedback from the pupils, teacher trainees and colleagues alike, but scheduling the sessions was very difficult due to clashes in the different classes’ curricula.

The mathematics theme days also gave us tools for organising long-term projects. We implemented at least one extensive learning module, designed on the basis of project-based learning principles, during each subproject period, such as the Farm Project during UBIKO 4. We designed a four-week learning project that included four ‘sibling days’. It was delightful when pupils kept asking to be allowed to go and continue the farm stories with pupils from another class. The finished works were easy to share on mobile devices using tools such as Edmodo, the class blog and Dropbox, or other social media. This way the pupils received feedback not only from teachers but also from their peers and their parents, who could view the final products online.

Many other forms of collaboration were discovered during the UBIKO project as well. We learned to ask our colleagues for help or tips spontaneously and naturally, as well as to share our observations with each other, often even during lessons.
Pupils’ Skype newscasts for other classes, experiments with Facetime, joint gatherings in the school unit and other events brought our otherwise separately located classes closer together in many ways. The fact that each mobile device had three to four users from different classes led to many types of inter-class collaboration where children familiarised themselves with other pupils’ work and interests. Fourth-graders were included in fifth-graders’ projects in several ways, which facilitates transferring many practices to the next grade as well. Personally, I felt that during these two years I collaborated much more closely with all the UBIKO teachers and the subject teachers working with my class than ever before.

One important aspect of team teaching is the collaboration between school and home. We held nearly all parent-teacher meetings in teams consisting of several teachers from one grade. One meeting, organised together with the teacher of a parallel class, was extremely rewarding. We had prepared a presentation together to encourage group discussion among parents. Parents were given different learning and homework-related problems to discuss in small groups. When the individual discussions were then summarised, there was some extremely active and enthusiastic discussion that even resulted in new common ideas for improving children’s motivation and learning.

Effects of the physical environment on learning

In spring and early autumn 2012 the UBIKO unit was redecorated with new colourful carpeting, a ship, bleachers, easily movable walls and glass-walled compartments. Desks and storage solutions for clothes and miscellaneous items in classrooms were changed. Even though the furniture and other items were still in their packaging, there were no desks and new chairs had not yet arrived when school began in the autumn, the new colourful carpeting and changes in the classroom acoustics already evoked cries of joy from the children. Little by little the new furnishings arrived. During the first few weeks we received something new for the classroom or the school unit every day. In this chapter I outline from the point of view of one class how the facilities can function as teachers.

In spring 2012, before the renovation, I gave my pupils the blueprint of the unit and asked them to design the kind of space they wanted as their learning environment. The pupils drew a classroom and school unit filled with sports stations, swimming pools, skateboarding parks, et cetera. Everything was colourful and filled with pictures. Even if I only relayed the children's wishes to the architects verbally, the children's reactions when school started were exhilarating: "I designed these colours!" "These features were from my design, weren't they, teacher?" The pupils embraced the interior design of the new unit from the outset. Besides the fresh colours of the soft carpeting we all also loved the soft soundscape, which was no longer as full of annoying clinking and clanking noises as before. Especially on cold autumn and winter mornings it was an empowering experience to put on woollen socks and walk across the soft, beautiful floor. At first we would often sit in a circle on the carpet when following a presentation on the unit's smart board. The colours of the carpet were happy and bright, and each area had its unique, pedagogically justified function.

Tables and chairs

With the new tables each pupil received their own workspace the shape of one-eighth of a circle. The tables could be combined in many different ways. We tried different "worm shapes", semicircles, full circles, groups of six tables and longer arcs, all of which could be formed easily. Once the pupils received swivelling chairs, the classroom became even more cramped and there were fewer options for arranging the furniture, but with the help of the new chairs the tables could be positioned even facing away from the board, as the children enjoyed swivelling towards the board. The first days were mostly spent playing with the chairs, but we made a deal with the children that they could swivel as much as they wanted before the lesson, as long as they stopped completely once teaching started. Rocking the chairs stopped completely once the new chairs arrived.

Footstools

Footstools placed in an arc were a better learning space than the previous options where pupils would sit in an arc on the floor, Fatboy chairs or cramped benches. The footstools were reasonably comfortable. Everybody could see each other's faces, and there was not nearly as much horsing

around with neighbours as on the floor or the rustling Fatboy chairs. It was easier to create a peaceful, equal and confidential atmosphere for discussion. Some of the trainee teachers found it most natural to stand in a circle, but before long they settled on the same level with the pupils as well. Once we acquired footstools for all pupils, we would begin more and more lessons by sitting in a circle. Thus the original idea for the decor of the classroom and the unit could be realised. The common teaching session was always held at the front of the class in a circle as appropriate for a dialogical teaching session, after which the pupils moved to their desks or other facilities to work independently. This procedure became more and more convenient as the spring term progressed.

Felix the ship

The first thing visitors notice when entering the Kirppa unit is the brown ship Felix with its white sails in the middle of the room. The ship was built as a place of assembly and an informal learning space. We have held morning gatherings and start-of-the-week discussions in the ship. This way everybody can see each others' faces and discussion is generated in a natural way. If there was no need to use the board and I let the children choose the location of the morning gathering, the loud majority always proposed the ship and no one objected or complained. The ship is also excellent for reading lessons. The children's working postures did not seem particularly ergonomic, but they have liked the area and therefore also completed their tasks without disciplinary issues. The children would often ask whether they could go to the ship to complete both individual and collaborative assignments. Mostly the first two or three groups were allowed to go. In my class Felix was clearly the most popular place to work among the pupils.

I monitored where each student preferred to work and which tools they preferred to use when given the choice throughout the project. In my class there is a group of active, athletic boys, one of whom was always the first to ask, "Can we go to the ship?" In their case I often had to move them to a different place in about five minutes or so, because as soon as they got to the ship they started intensive wrestling competitions or began building playhouses and could not focus on completing their tasks. However, many children soon realised that being allowed to go to the ship without a teacher present required self-control and taking responsibility for their studies.

Open walls

One feature that joined the facilities together was that the walls of four of the classrooms could be opened, and the opening mechanism was made easier to use. This gave us a fairly spacious but compact area for holding events that were remembered as pleasant team-building occasions. I would keep the wall at least partly open whenever possible, because I felt like I had better control over the pupils working elsewhere in the unit, even if I could not see inside the ship or many other places from the classroom.

Below is a description of our unit written by Anette in our class magazine, which we completed during newspaper week in 2013:

New learning facilities at the Teacher Training School

The Oulu University Teacher Training School was renovated in 2012. One unit has carpeting, a new ceiling and iPads. Pupils were also given a ship where the different classes sometimes go to complete their assignments in peace. Pupils use iPads for writing and completing various exercises. On Mondays or Tuesdays the pupils gather in the ship to talk about their weekend. At the teacher training school it is also important to read your desk book, and this is usually done in the ship as well. Pupils have their own iPads and a number for the tablet as well. There are 40 numbers, which means that forty pupils can use them at once. One negative thing about the ship is that some pupils go there after the break and disturb other groups' lessons. Trainees have been interested in the ship and want to start some lessons there.

Pupils as content producers

The UBIKO unit received new iPods and tablets in late winter 2012. They enable teachers to implement many pedagogical practices that earlier would have required both computing skills and several arduous preparation and post-production phases. This chapter outlines the opportunities provided by these tools.

Our mobile devices were used jointly by 110 pupils, but each individual device only had 3-4 appointed users from different classes. Every pupil always used the same iPad and used it for saving their work. Even though the pupils took turns using the devices, they shared the responsibility for the device itself and for keeping each other's work safe. Teachers were in charge of purchasing software with the school's AppleID, and we purchased plenty of apps to experiment with.

The iPads were mainly used in place of notebooks, and the pupils used them for making notes, completing assignments and writing essays and reports. The iPad is a handy and versatile device with applications for word processing (Pages), calculus (Numbers) and notes (Keynote). Ever since primary education, the pupils have used the presentation tool on Google Docs to compose at least one slide each week about what they have learned during the week as a type of learning portfolio. Compared to this the children found using Keynote and other iPad apps easy. They did not have to wait for the device to turn on, and they found new tools for image manipulation, changing fonts and backgrounds, as well as adding effects and animations every week. The children found all of this enjoyable. They watched slides and other children's presentations every week, and soon they noticed how annoying it was if special effects drew the attention away from the presentation topic or the slides contained plenty of superfluous details. I believe that children should learn to play with effects at a young age, because at some point they will want to try them out anyway.

As soon as the iPads arrived I used one to read an ebook about a healer cat to third-graders, projecting the book on the board. The pupils suggested that we start writing an ebook as well. Since the pupils were already in the process of completing a project about how various animals in Finland spent their winter, we decided to turn it into a book and use the iBooks Author app for creating the layout. Each pupil painted a watercolour picture about their chosen animal and digitised the paint-

ing. Then they used Pages to complete their presentation and emailed both the text and the picture to the teacher. We used plenty of breaks and stayed after school to complete the layout of the book and to add widgets (various interactive elements) on the pages, because we could only do this with the Published software on our only Macbook.

A week after I had submitted our book for publication in the iBooks Store I received a message stating that one of the widgets was faulty. Since I found nothing wrong with the widgets, I tried to edit and fix them and ask for advice, but every time I submitted the file I received an identical message. I removed the faulty widget entirely, but received a complaint about another widget. After a few frustrating weeks of emailing I removed all the interactive elements, and then finally received the long-awaited message that our book was now available for purchase at the iBooks Store. (See https://itunes.apple.com/fi/book/elainten-talvi/id503597152?mt=11.)

Since the pupils got to participate in making the first Finnish-language nonfiction book for children to be published in the Apple Store, their motivation to work and learn new things increased. The pupils immediately learned how to use the Strip Designer software, designed for creating comics, and found many new functionalities that the teachers never even knew about. Before long the pupils collaborated extensively, using different iPad apps for creating content. They used Keynote for presentations, Pages for essays, Strip Designer for comics, Puppet Pals or Book Creator for digital stories, Popplet for mind maps or creating schematics about plotlines, and iMovie for films. In the early stages of the UBIKO project teachers might define the form of a report very strictly, but during UBIKO 4 the pupil groups were allowed to select the apps used for creating their farm story report freely. This way the final presentations ranged from poster presentations to a movie.

The iPads were utilised extensively in mathematics as well. We found some good mathematics apps, such as Math Bingo, Matikkakunkku, Motion Math and Math Board, all of which helped to motivate the children and developed their mathematics skills. It is likely that there are many other good apps as well. These mathematics games motivated the pupils to complete dozens, even hundreds of exercises after finishing all basic and supplementary exercises in the textbook. Both classes that I taught became unbelievably interested in calculus. This is largely thanks to the well-designed iPad apps that were both motivational and differentiating. The Dragon Box 12+ app published in spring 2013 inspired even third-graders to intensively work on solving equations.

Social knowledge building online

Throughout the UBIKO project we also tried out different tools that enable collaborative knowledge building online, such as Popplet, Google Docs, Socrative and Etherpad. They were used in different class projects.

In my class we have used a class blog for distributing information about the class and saving and evaluating pupils' work ever since the first grade. In spring 2013 the pupils started their own blogs. As outlined in the UBIKO objectives, at the start of each week we would enter the learning objectives of the week in the blog. Then, on the last lesson on Friday, the pupils commented on their blog

post from Tuesday and wrote down which goals they had achieved and what they needed to practice some more. Learning to set objectives was difficult for many fourth-graders, but even the slowest pupils learned to put at least some thought into what a good objective would be like. It was always easy to return and refer to the pupils' own objectives when they felt that they had completed all their assignments. On the other hand, some pupils set such easy goals for themselves that teachers had to instruct them to improve the quality and content of their work. Sample objectives can be found on the right-hand sidebar of the class blog, which includes a list of the pupils' blogs (http://nelosluokka.blogspot.com). If there was time, pupils also commented on their friends' objectives in their blogs. In class 5a the pupils also set themselves a common weekly objective, which everyone could access throughout the week.

Popplet was a good tool for creating mind maps together. Mind maps can also include links, photographs and the pupils' drawings. In addition, pupils can work on the same mind map together online. Similar tools include Google Docs documents, Etherpad and Socrative, which can be used for creating questionnaires and tests and marking them in real time. Learning is always improved if the learners spend as much time as possible working on the topic at hand. On the iPads many study contents that foster the development of children's thinking have been disguised as games, which makes them more attractive. Even without thinking, children may write long stories and reports, as well as complete assignments and exercises that would otherwise require all kinds of motivational gimmicks – and even then their work might not be nearly as intensive, enthusiastic and focused as what we witnessed in the UBIKO unit because of the mobile devices.

Individual learning pathways

Finally, we discuss how individual pupils' learning pathways were rendered visible and which assessment practices we discovered during the UBIKO project. We strove to instruct the pupils to share their work both with themselves and their teachers in an online folder or cloud service, such as Dropbox, iCloud or Google Drive. Most works were seen as so personal that the pupils did not want to add them to spaces such as their learning blogs. Images were shared via Picasa online folders, and some works were added to Edmodo. Sharing videos was difficult due to their large size. We have yet to decide upon clear common guidelines for sharing and storing the pupils' work. Since the pupils always use the same iPads, all their reports and projects can be found easily. For this reason, we mostly use iPads for creating various kinds of project reports. Some pupils always entered their weekly objectives in a mind map (Popplet), which made it easy to to review progress over the past weeks with the pupils. In assessment sessions we always brought out each child's iPad, and the children would present their learning objectives and finished accomplishments to their parents. Since the parents were genuinely amazed at the children's videos, comics, ebooks and mind maps, the school projects became even more valuable in the assessment sessions. In these and other discussions the children were also quite adept at assessing their work, pointing out particularly successful details to their parents and explaining what they wished to improve.

Some apps, especially mathematics apps, only allow the child to proceed to the next level after they have completed all the exercises of the current level. The device gives user feedback regardless of

whether the answers were correct. Many apps include elements that motivate even weaker pupils to repeatedly try to complete the exercises successfully. Some apps measure the time spent on completing the exercise, and pupils often complete similar exercises again and again to get a top score. For the teacher it was easy to monitor a pupil's progress by checking which level they had reached. The children also explained voluntarily which issues they found difficult or easy in a given app, as well as which exercises they had completed with the different tools.

Many learning assignments, such as essays, are in themselves differentiating. When writing an essay on an iPad, verbally and linguistically talented pupils can complete even an entire novel while the slowest pupils still practice spelling or using simple sentences to create basic story elements. There is no upper limit, and iPads make it easy to illustrate and improve the text in many ways, much easier than when writing by hand. Teachers can spend their time advising the pupils who need more instruction, and advanced pupils can read each other's texts as well as give feedback and constructive criticism. For instance, it was very delightful to read one pupil's constructive criticism about a classmate's essay: "This was nice to read, because the story was funny and exciting and the right length. Could you start your sentences with some other word besides 'then' more often? You described the main character really well."

We spent a lot of time assessing the projects from many points of view. Self-assessment focused on what was good about the project, what should be improved and what we could learn from, while peer reviews focused on successes. Every presentation was usually assessed immediately afterwards. Teachers instructed pupils beforehand to pay attention to specific aspects of the presentation, such as the presenter's voice, posture and gaze, or the content, interestingness and illustrations of the presentation. Finally, teachers and trainee teachers gave written feedback about each pupil's work during the project.

Conclusions

Many aspects of both the teachers' and pupils' working methods changed during the UBIKO pilot and subprojects. During the project we discovered practices that improve pupil commitment to long-term projects and their study motivation. When pupils ask whether they can go and work in the ship, I can ask them how well they think they can learn there. Mostly the pupils begin to reflect on whether the ship is the most practical place to learn in terms of the assignment at hand. If I see a boy who is uninterested in school and who mainly keeps horsing around in the classroom stop and think about his learning process even just a little, I know that the UBIKO project has been successful! It has brought about many new perspectives, examples of successful interaction, empowering experiences and new enthusiasm for working with children and their future.