Talking Tools – learning sloyd with smartphones

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ABSTRACT

Craft and design (sloyd) is a compulsory subject taught in grades 1-7 in primary schools in Finland. In grades 8-9 the subject is elective. The learning process in sloyd is highly student-centred and focused on individual learning processes during which tangible artefacts are manufactured e.g. in wood, textile materials, metal and plastic. Sloyd also includes basic mechanics and electronics.

The subject´s character is highly communicative and traditional teaching materials in the form of e.g. textbooks have a minor role. Because of the subject's student-centered and productive nature, teachers create most of the teaching material themselves, depending on the needs of the areas of work, the teaching context and students (Porko-Hudd, 2005, pp. 68–69) The teacher is often forced to repeat her instructions for individual students when teaching sloyd to a whole class. This is mainly because all pupils are not simultaneously in the need of the same information. On the contrary, students often need very different information under completely different times. The individual craft processes means individual learning needs.

Decreasing costs of smartphones and increasing capacity in data storage and wireless networks, pocket-size mobile devices are becoming powerful digital tools, creating new possibilities for learning (Pachler, 2009, p. 4) In the case of sloyd education, mobile technology might provide tools for changing the teacher´s role and the character of the communication between the teacher and student. The main idea in developing the mobile solution *Talking Tools* is to encourage learner autonomy by providing a learning platform including e.g. virtual learning objects and tools for work process documentation. The vision of the project is to create a smartphone application that on the one hand can enhance student autonomy and consciousness of learning. On the other hand to free teacher resources for renewing one´s teaching practice by shifting focus and characteristics in the teacher–learner communication.

Author Keywords
Sloyd education, mobile learning designs, learning object accessibility, UpCode

OUTLINING A MOBILE APPLICATION FOR LEARNING SLOYD

There is an added value of interdisciplinary collaboration when designing a learning platform and high quality learning objects for a mobile device. Sloyd education researchers at the Faculty of Education at Åbo Akademi University (ÅAU) are the initiators of the project *Talking Tools* and in charge of the didactical teaching materials that focus on presenting manufacturing processes. Furthermore they are planning the instructional design of the mobile application and researching the pedagogical use of the product. MediaCity at ÅAU also have several roles as studio staff is filming and editing the learning objects, format developers are involved in the instructional design, and researchers at the user experience laboratory are carrying out the usability and user experience testing during the iterative design process. The third part consists of UpCode Ltd., a software company known of their expertise in scanning technology similar to the widely used QR code.

One of the main ideas of the smartphone application Talking Tools is to give learners access to learning material via their mobile phone whenever they are about to carry out a task or a skill. Therefore *Talking Tools* will include a database of short, pedagogical audiovisual learning objects that help learners to manufacture the product they designed. The application will help the student e.g. to select the right ironing temperature or choose a correct saw. Whenever the student

is in the need of information about tools, production techniques, the use of machines etc., he can simply run a keyword search in the Talking Tools learning object database. The search can be made anywhere, anytime.

UpCode Ltd.'s code-scanning technology also creates opportunities to turn the sloyd classroom into an interactive space with information embedded in UpCode-codes connecting learners from the physical classroom to digital learning objects about tools, techniques and materials. The UpCode- code stickers on different tools and machines makes information available in the location where it is needed in the moment e.g. at the tool cabinet or the sewing machine. For example if the learner is uncertain how to use the sewing machine, he scans the code on the sewing machine with his mobile device. He is then linked from the physical space into a digital space where he is provided pedagogical audiovisual information about how to use the sewing machine. This so called blended learning environment consists of physical face-to-face interaction and technology mediated instructions (Graham & Dziuban, 2008, p. 270). Graham and Dziuban suggest that blended learning environments can both improve learning effectiveness and increase access to information. The key factor is nevertheless in the case of *Talking Tools* how to combine the best of both worlds in order to create opportunities for improved learning experiences.
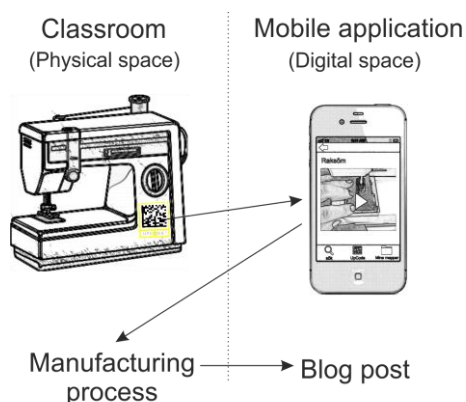

Figure 1. The learner shifts between the physical classroom and the digital mobile application.

Figure 1 shows how the use of the mobile application can be used in a classroom, The *Talking Tools* application combined with UpCode codes on the sewing machine creates a blended learning environment, a mixture of the physical space and the digital space. The learner shifts between the classroom and the mobile application via UpCode-codes, in this case a code sticker on the sewing machine. The information embedded in the code then hopefully helps the learner to perform a task or a skill needed in the manufacturing process. The learner can later document her work process in her blog in the application.

In order to promote student autonomy and a wider consciousness of learning, *Talking Tools* will also include a tool for work process documentation. The documentation tool allows the learner to post comments in her work blog about her design and manufacturing process, –what influenced her design and what problems she encountered and how she managed to solve the problem. Students can post short text comments and also post pictures, video and voice comments in their work blog during lessons, on the school bus or at home. This will hopefully help the student to evaluate and predict her work process. Since the teacher have open access to the students work blogs the teacher can keep track of the students work activity, give students feedback and give the students additional work assignments.

The benefit of using wireless, lightweight mobile devices in sloyd is that information is available in the environment where it is needed in the moment, at the tool cabinet, ironing board, or workbench. The question which the student then can ask the teacher reads no longer "What and how do I do next?" but "I've been meaning to do this, is that OK?" The teacher will therefore have a more affirmative role and the student in turn becomes more independent in their work. The learning object should not be seen as substitute for a professional teacher, nevertheless *Talking Tools* might shift the focus and characteristics in the teacher–learner communication by providing a tireless teacher that teaches the same thing over and over again.

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