

Exploring Teachers' perspectives on the use of Mobile devices for Math and Language Learning

Category: Research in progress

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Introduction

“Digital competence” and practices such as “social networking” are today seen as central skills that citizens of the 21st century should have (Lucas and Moreira, 2009). In spite of these developments, recent studies have shown that most of the innovations related to the use of ICT in schools have not impacted pedagogical or school development (Buckingham & Willett, 2006; Coiro et al., 2008; Snyder et al., 2010). The problem is far from being trivial since online communication and interaction are not longer a separate phenomenon from children’s daily lives. In this socio-technological configuration, schools in particular are deeply challenged as they are confronted with questions such as: What kinds of learning strategies and skills are kids developing outside schools? What are they learning in their interaction with digital tools? Which opportunities for learning and work do digital tools really afford? How are schools aligned to the conditions for learning and teaching that the use of digital tools promotes today? Goodyear (2011) claimed that we are facing two perceptible changes in the field of educational research. The first is a shift in our sense of the spaces and contexts in which education takes place, as different learning activities are becoming more commonly distributed across a variety of contexts. The second change is a wider understanding with regards to the conception of educational praxis, acknowledging the growing importance of design. In order to better understand some of these emerging challenges, we have recently started a 3 years research project aiming at: i-understanding the intricacies and complexities of introducing mobile technologies into schools’ curriculum and accepted teaching practices and ii-analyzing the actual transformations that the use of mobile technologies in school bring to current and future school practices. In order to address the challenges stated above we have decided to focus on two distinct but complementary domains as starting points of our investigation: i-the teaching of mathematics and ii-the teaching of Swedish as a second language.

Research questions

This paper focuses on examining teachers' ideas and prejudices about using mobile devices in the classroom. We aim to discuss the following questions: *How can schools introduce mobile devices into mathematics and language learning everyday classroom practices? And which pedagogical standpoints should be considered in such endeavor?* More in particular, we are exploring teachers' discourses associated to the introduction of mobile devices into the classrooms of math and Swedish.

Methodology

The project is grounded in design-based research (DBR) (Brown, 1992; Hoadley, 2004, Mor & Winters, 2007), which is a research approach that blends empirical education research with the theory-driven design of learning environments. For the study of different types of transformations the use of mobile devices brings to the structure of classroom interaction, we have chosen, on the one hand, to focus on the analysis of verbal interactions (Kerbrat-Orecchioni, 1990; Pachler et al., 2010) and, on the other hand, on the material outcomes produced by the participants such as multimodal texts, diagrams, graphs, films, interactive presentations, experiments etc. from the perspective on multimodality developed by Kress (2010).

Ongoing data collection

We have so far conducted 10 interviews with K-12 teachers working in three different schools. Overall, we will have 20 interviews with teachers from four schools. Two of the schools have already implemented the use of tablets (Ipad) in their classroom and one of them is considering starting using mobile devices in their teaching. So far, teachers of Swedish as a second language who daily use Ipad for teaching purposes expressed, children with other native language than Swedish use these devices as tools for expressing themselves as they can easier communicate their ideas through films, presentations, and drawings. They make use of applications such as Dragon speech recognition software that convert voice into text helping them to visualize oral communication and thus work on spellings and grammar. Audio books are also an application that students having Swedish as a second language appreciate, as they can read texts while listening to intonation, accent and rhythm of the words. We think that in some way, the Ipad are supporting affordances of visuals for communication that help children to both learning about the target language and to create meanings in Swedish from different modalities. In the mathematics subject, we have so far found that teachers consider the applications running on the Ipad work as tools that help pupils to explain mathematical problems or concepts in a visual way. The fact that pictures, images or films can complement verbal explanations is positive for the understanding of abstracts concepts. Furthermore, teachers in mathematics

have noted that the use of Ipads make children to be more talkative as they have to explain not only *what* they have done with the Ipads but also *how* they have done it.

Based on the initial analysis of the interviewed we are conducting four design workshops (Future Workshops, and co-constructions workshops). The future workshops could be seen as structured brainstorming sessions consisting of three phases: critical, fantasy and implementation (Jungk & Mullert, 1987). The structured workshops we have conducted have been inspired by Liikkanen and colleagues (2011) work, that present a process to support brainstorming. The outcomes of the workshops are being analysed with the help of affinity diagrams (Beyer, H. & Holtzblatt, K., 1998). The aim with the workshops is to identify: a) current problems in the teaching of mathematics and language concepts of narrative genre and basic geometrical concepts; b) teachers' views on technology and in particular on mobile devices and its use in the classroom; c) advantages and disadvantages related to learners' use of mobile devices in schools. The outcomes of the workshops will inform the next phase. At the end of this phase we will have a clearer picture of potential scenarios and supporting digital tools along with concrete pedagogical models.

Next steps

The next steps of the project involve two distinct phases. Phase one will still be directed to the initial stage of exploring the design space. In order to progress with this activity, and in parallel with the on-going interviews, future workshops have been conducted. The outcome of the interviews and the workshops should allow us to make concrete proposals to the teachers and inform the development of phase two. In phase two we will direct our effort towards the study of the transformations that the introduction of mobile devices bring to the classrooms' talk structure and examine what kind of instruments teachers and learners can create with regard to the use of mobile devices for learning about narrative genre and basic geometrical concepts.

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