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Integrating ICT in classrooms – collaboration between a municipality and a university built on an open learning process

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Abstract: In this paper, we describe a collaboration project between a municipality and a university in Sweden where the aim has been to integrate ICT in classrooms through an open process of collaboration at different levels. Teachers, process managers from the municipality and researchers from the university have met regularly over a two-year period of time in Collaborative Development Groups (CDG). In these groups the participants have discussed and worked progressively with issues generated when implementing new technology in educational practices. The collaboration was designed as an open process over an extended period of time in order to enable a reflexive process between participants at different levels. Some salient aspects of how the collaboration has contributed to school development in general are accounted for in this paper. Furthermore, how the collaboration has aided in developing the use of ICT in classroom practices is explicated. One conclusion that can be drawn is that new competences have evolved from the work in the CDGs and the extended dialogue on how to use technology pedagogically. The teachers pedagogical knowledge has during the process been merged with their technological knowledge as well as the content knowledge of the subjects they teach (Mishra & Koehler, 2006). For researchers and teachers to work together under a longer period of time has enabled the development of a reflective pedagogical use of ICT.

Keywords: School development, collaboration, ICT, innovative teaching

1. Introduction

The access to technology in Swedish schools is comparatively high (European Commission, 2013, Skolverket, 2013). However, the everyday use of ICT in classrooms has not increased to the same extent as the availability. While earlier surveys showed that teachers expressed the need for in-service competence development, there appear to be a change in recent studies, where teachers instead point out the need of competence development regarding how to use ICT pedagogically in their subjects (Skolverket, 2013).

Historically, a number of projects have been implemented in Swedish schools with the aim of promoting ICT in schools. Investments in technology and in-service training, have been carried out at different levels; as investments in technological infrastructure and professional development, both individual and collaborative. However, the focus regarding the use of ICT in schools, has often been on either the technology in itself or on the handling of it (Karlsohn, 2009). In this paper, a collaborative project between a municipality and a university around the implementation of ICT in schools and preschools will be presented and discussed. One of the intentions with the project was to evade focusing on technology and instead relate technology to pedagogy and content. Mishra and Koehler (2006), in their TPACK-model, argue that it is necessary that these three components are related to each other if technology is to be productively integrated in educational settings.

The collaboration was designed as an open process which was developed along the way. Groups, called collaborative development groups (CDG) consisting of teachers from schools and

preschools, a process manager from the municipality´s school development department and a representative from the university met regularly during eighteen months. A primary tenet was that the teachers should have the primary ownership of the issues worked with and the working process. In the CDGs, the participants discussed how to use ICT in schools and preschools and they read and discussed articles and research regarding various areas of interest. The teachers conducted small-scale investigations in their classrooms where they explored new ways to use ICT. Documentation of the investigations were later discussed andanalysed in the CDGs. A core idea is that the CDGs offer a reflective space.

The CDGs are designed as a context-specific, or thematic, approach to professional development of teachers. They are similar to Professional Learning Communities (PLC) as described by Defour et al (2009). However, the purpose of the CDG is primarily not to improve learning outcomes as in PLCs. The area of interest in the CDG concern the design and development of learning environments that support all students´ learning, rather than on how achieve specific learning outcomes in certain subject matter areas. To improve learning outcomes is more a secondary goal, which the learning environments aim to facilitate.

Timperley (2008) advocate for a context-specific approach to professional development of teachers as it enables teachers to identify and solve issues in their particular teaching situations. To treat teachers as technicians who can be expected to implement new sets of behaviour which they have been taught, is an approach which disregards the complexity of teaching as well as teachers need to be responsive to their students. Instead teachers and external expertise need to be involved in discussions in order to develop understandings which are meaningful in the teachers´ practical contexts (ibid.). These kinds of discussions have been an essential part of the project, in particular in the CDGs.

Reporting on projects with a similar collaborative approach Sutherland et al (2009) and Barnes and Sutherland (2007), state that the participants are challenged in their beliefs about teaching and learning when engaging in reflective discussions about their own practice. Barnes and Sutherland (2007) reach the conclusion that these collaborative partnerships where teaching and research cultures are blended "potentially lead to more insightful notions of the inner workings of a classroom" (ibid., p. 290).Timperley writes that the current practices of teachers' need to be challenged and teachers need to be supported when making changes in their practice. She claims that external expertise is necessary in order for teachers to be able to "understand new content, learn new skills and think about their existing practice in new ways" (2008, p. 20).As the CDGs consisted of teachers as well as process managers from the municipality and representatives from the university, different actors, with different expertise, could share, challenge and support each other in these groups. Even though the intention was to develop classroom practices the CDGs also facilitated mutual developments, or co-learning (Barnes & Sutherland, 2007), through a reflective process where the different actors engaged in discussions and developed shared understandings around the issues they focused on.

Parallel to the CDGs, other group constellations met on a regular basis. The process managers from the municipality´s school development department and the representatives from the university regularly had meetings where they continually monitored and evaluated the on-going processes in the CDGs which enabled common themes and different group processes to be further discussed. In the CDGs the representatives from the university have mainly been Ph.D. students. Their roles in the groups have been to challenge, feed in research-based information and support in the way described by Timperley (2008). An important aspect is to guide teachers in their development of a language to talk about their teaching. As the Ph.D. students are experienced teachers themselves, they also have practical knowledge of what teaching entails which Timperley(ibid.) sees as crucial when engaging in context-specific professional knowledge.

What an open process containing actors from different institutions and at different levels of the school system, entails will be discussed in this paper. What can be seen as positive effects, as well as dilemmas, and what can be learnt from participating in such a process are questions that this article attempts to further illuminate.

2. The school – university collaboration

At the beginning of 2011 the municipality saw a need to elucidate the relationship between technology and pedagogy when investing in ICT in their schools. The University of Gothenburg was contacted by the municipal school authorities to find out whether it was possible to design a joint project where the university followed the implementation of ICT in schools and preschools in the municipality.

The collaborative project was, in the initial documentation from the municipality, conceptualized as participatory research. From the university's point of view the collaboration was considered as a school development project, with potential for researchers to access data. The collaboration hence worked on the premise that the municipality and the university, partake in the collaboration with slightly different aims. The different standpoints can be seen to reflect the purpose of different institutions where the municipality is responsible for developing the schools within their jurisdiction while the main concern for the university is to document and analyze the school development processes. Thus, the municipality and the university share a common interest in how to develop and integrate the use of ICT in educational settings.

No goals or objectives were formulated *for* the teachers´ improvements of their practice at the start of the collaborative project. Instead, each CDG was to formulate their own agenda and objectives, to plan their work and to find a focus area. The main idea was that the teachers should bring their concerns and questions to the CDGs where they were further discussed and reflected upon by all participants in the CDG. The teachers were urged to document their practice e.g. by taking notes or video recording their classroom practice, as a foundation for reflection and enhancement of their teaching individually and in the CDGs. The teachers then tried ideas in practice and documented it so that it could be further discussed in the groups. These reflection-action cycles resemble the iterative cycles that are the core methodology in design-based research (DBR).

The collaborative project was organised in different levels. A steering group consisting of a professor from the University, the head of the School development department in the municipality, a process manager from the school development department and a Ph.D. student met regularly to plan and discuss what needed to be done at the different levels and the content of meetings where several groups were involved. The second level consisted of a group of researchers from the University and process managers from the school development department and the third level contained the CDGs. A fourth level was the classroom level, where the practical work was carried out. TheCDGs consisted of approximately 4 to 8 teachers, a process manager from the municipality´s school development department and a representative from the university. The construction with municipal responsibility for managing the process was regarded as critical. The first and the second level mainly functioned at an organisational level where planning and evaluating the process were the main concerns. The work done in the CDGs were aimed at discussing and developing classroom practices where the integration of ICT as a pedagogical tool was the main focus. The groups consisted of teachers interested in specific themes or subjects. The teachers primarily came from different primary schools and preschools in the municipality.

Once or twice every semester everybody involved in the collaboration project at the three levels met to discuss different topics in reflective seminars. These meetings were a way to monitor and follow different processes at different levels and members from the CDGs were able to present the work they were involved in to a larger audience. At the meetings the steering group also reflected on the process in order to pinpoint what had been achieved so far and what could be anticipated as the next step in the process. .

3. Data

The primary data on which the claims of this article are built upon consists of the documentation produced by the CDGs in the form of written text and multi-media productions, audio or video-recorded interviews with participants and video recordings of joint group sessions and seminars. The participating teachers and preschool teachers and the process managers were also given an evaluation questionnaire with eight overarching questions and open answers.

4. Results

In the analyses three critical themes of the working process emerged: Collaborating in an open process – strengths and dilemmas; Learning processes – individual and collective; and Learning and documentation. These themes are presented below, illustrated by excerpts from the data.

4.1 Collaborating in an open process – strengths and dilemmas

The design of the collaboration project was intended as an open process where there was no clear or predicted goal to be reached. This open process was intentional and aimed at creating a reflective process where the participants saw their own involvement in the process as important. In an open process the participants may designate their own individual goals as well as goals developed through group processes. However, not proclaiming a set goal at the start of the process invoked uncertainties in some participant as to what the process entailed and what was expected of them if they engage in the process.

> Excerpt 1
> *"The advantages have been that there has been a great possibility for participants to influence and shape the process. Disadvantages are that it takes time to get started and that the ambiguity involved in not knowing the intended goal meant that we lost some participants in the initial phase."*
> Process manager from the school development department

As is stated in excerpt 1, there were participants, mainly teachers, who decided not to continue to partake in the collaboration. This was particularly prominent at the outset of the process. As the different groups were established and started to meet regularly, the dropout rate declined. Those who dropped out at an early stage of the process are to a large extent absent in the collected data and therefore it is not possible to say whether their reasons for dropping out were related to the open process or to other factors. Other participants, however, saw the openness of the process as a positive experience which in itself was of importance and which increased the flexibility of the project.

The process managers from the school development department had experience from partaking in and leading development projects of different kinds and could thereby reflect on the difference between quicker and more common process and the slower process which they had been involved in here.

> Excerpt 2
> *"This is another type of process, building on the notion that learning develops over time, we learn over a long period of time. We are obliged to do certain things between the meetings. There is a next step, something we should try out or do."*
> Interview with process manager from the school development department

The importance of "trying out" and doing things in the classroom in-between the meetings of the group was pointed out as important in clarifying that there was a next step in the process and what that entailed. That reflection recognizes both the support given in the CDGs, as well as the need to be challenged in order to progress. Providing the teachers with tasks to do in-between the meetings was a means to challenge and support the development of classroom practices and to make the process which the participants were engaged in visible.

4.2 Learning processes – individual and collective

Being part of a CDG involved learning processes at an individual level as well as a collective one. Over time the groups developed a collective understanding of the issues they were interested in and which they had discussed during the meetings.

> Excerpt 4

"We have all had very different angels from which we have approached issues. In spite of that we have often encountered similar problematic areas."

Preschool teacher

Several participants reflected on the merging of individual and collective learning processes and the enhancement of their own development when they were able to engage in how other members of the group reflected on their experiences. The participants repeatedly expressed that their own understanding and development had been enriched by partaking in the CDGs. By sharing with others what they did and by listening to other group members´ experiences they had reached another understanding of their own practice but also of general pedagogical issues.

One of the process managers from the school development department suggested that the discussions in the groups had become deeper during the process and that they had reached a higher pedagogical quality.

Excerpt 4

*"They (*the teachers*) ask themselves critical questions. Initially with the apps they just threw themselves at whatever but now they are more critical of how they use them.…They had a pedagogical competence but it was not visible to them. That has become visible to them during the process. Then they had a digital competence which has been refined since they have become better at using the digital tools – but then these two competences have also merged"*

Interview with process manager from the school development department

What is voiced here is that the teachers who participated in the CDGs not only developed their competence in handling digital tools and their pedagogical competence, but also merged the two. The collaboration has enabled the participants to connect their pedagogical knowledge with their content and technological knowledge which, in turn, has enabled them to use ICT in a pedagogical manner where it was adapted to the content of particular subjects. This process took time and was developed in stages throughout the meetings.According to Timperley it "typically takes one to two years for teachers to understand how existing beliefs and practices are different from those being promoted, to build the required pedagogical content knowledge, and to change practice" (2008, p. 15). The process required active involvement in dialogues where shared interests were reflected upon and where the group, and the individual participant, developedand merged their pedagogical, technological and content knowledge.

4.3 Learning and documentation

An example of the projects' effects on the involved teachers' practice can be found with the preschool teachers implementing tablets to their daily practice. In preschool, pedagogical documentation is about documenting the children's activities together with the child. Filming, taking photos and notes are significant elements for documenting the activities of the children and for reflecting together with them. This makes it possible for the children to become co-creators (Palmer, 2012).

The preschool teachers previously documented the children in their preschools using ready made electronic sheets and matrixes. When the teachers were equipped with tablets they experienced how the method with which they conducted their pedagogical documentation changed. The children became involved in ways that they had not been previously. The teachers no longer saw themselves as observers, but rather as co-producers.

"We as teachers are no longer on the outside, we are co-explorers, we are together in discovering and reflecting."

Interview with preschool teacher

The teacher and the child shared the creation of the pedagogical documentation. The design of the project with the university and the municipalities´ school development department as active participants in the CDGs brought in new tools for reflecting onhabituated methods. The understanding of practice deepened as ideas discussed in the CDGs were tried out in the classrooms. The preschool

teacher described how the reification of their work in the documentation changed the learning process and the understanding of what learning means and entails.

5. Conclusions

An open collaboration between a municipality and a university has in this article been described and some salient aspects of how collaborations like this one may contribute to school development in general and development where ICT is considered to be integrated in classroom practices in particular, has been illuminated.

The design of the collaboration stems from the idea that the development of knowledge is a generative concept. A platform for collaboration is needed in order to develop knowledge which can be tried out in practice. Another premise for the collaboration is that it is a locally driven process, owned by participating schools and teachers. The processes have to take place locally and closely relate to the work carried out by teachers in order to develop the teachers' practice and their understanding of how to incorporate ICT in their work with the pupils.

Through the work carried out in the CDGs, the participants have developed a "new" understanding of the relation between technology and pedagogy where technology is subsumed as well as subordinate to pedagogy. Even though claims are often made that pedagogical issues should determine the use of technology in education, the discourse about these issues often mainly concern the use of technology. Pedagogy is reduced to technology. In the CDGs the participants initially focused on technology but gradually their focus changed so that how to make pedagogical use of technology in different content areas became the main issue. That ICT in different shapes and forms, is part of the development of society today is an important premise when regarding how to integrate ICT in education. ICT cannot merely be seen as a tool or technology but rather needs to be regarded as part of the infrastructure of education.

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