Teachers’ Professional Development and ICT: A Comparison of Four Swedish Cases

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Abstract
In this article, the design of a multiple-case study on Technology Enhanced Teacher Professional Development (TETPD) is presented, as well as the selection of cases and theoretical framework for analyzing TETPD. The aim of the article is to discuss four Swedish cases of teacher professional development with technology and media selected on these premises. The significance and possibilities of the cases to describe how programs of professional development work in terms of enhancing the use of ICT for teaching and learning are then discussed.

Introduction
Information communication technology (ICT) has been bringing increasingly greater changes in the system, policies, programs, curricula, resources, teaching methods, and other aspects of education. “Technology Enhanced Teacher Professional Development (TETPD) in Sweden and China” is a three-year research project funded by The Swedish Research Links. The purpose of the project is to study TETPD in Sweden and China, aiming at exploring the status quo of TETPD in both countries, especially teachers’ attitudes, experiences, and understanding of technology-enhanced learning and teaching, and identifying models and the common factors that contribute to successful TETPD. This article reports on the design and selection of cases for a multiple-case study in both counties, with a focus on the Swedish part.

The Need for Teacher Professional Development
Constant change in the working conditions of teachers together with an increased impact of information and communication technologies both lead to a need for teachers to engage in professional development activities. Teachers’ professional development (TPD) is therefore a dynamic area of constant change, and as teachers’ knowledge and skills are in a constant need of improvement teachers are in need of TPD. According to Diaz-Maggioli (2004) TPD is often constricted by a numbers of barriers. Among others he talks about TPD as often being a question of top-down decision making, characterised by a lack of ownership of the professional development process, an inaccessibility to professional development opportunities, and little or no support in transferring
professional development ideas to the classroom. Others have identified further barriers such as TPD arranged and carried out in single or short sessions in which the teachers is attending in person (McRae, Ainsworth, Groves, Rowland, & Zbar, 2001).

In Sweden TPD seems often to be initiated on a central, governmental level with directives concerning financing and organisation of content and implementation (see, e.g., Ordinance 1982: 608 and Ordinance 2007: 223). Governmentally initiated TPD has been studied and analysed both in Sweden as well as internationally. For instance, Strömberg (1994) and Englund (1992) hold that state controlled TPD is a means for the state to ensure that teachers are loyal to the curriculum rather than to the traditions of the profession. Diaz-Maggioli (2004) holds that the steering limits the ownership of the TPD and Husby (2005) argues that it make the teachers’ learning less meaningful. Similar ideas are found in Hargreaves (2006) and Goodson and Hargreaves (2003) who hold that teachers search for continuous learning should be encouraged instead of teachers giving in to demands for change from above. Blase (2005) holds that teachers often find themselves in a political, economical and social dilemma regarding their TPD. To summarize, teachers and professional development is an area in which several interests intersect in a complex way. This seems to leave teachers in a position where they have to balance their ambitions with those of their employers and society, as well as with loyalties towards parents and pupils. Given these constraints, it is interesting to try to provide for a further understanding of TPD in an age where technology is becoming more and more a central issue. Two prominent dimensions can therefore be realized as important for understanding the premises of TPD: 1.) whether driven with a top-down approach providing teachers with content formulated outside of their own practice or driven by a bottom-up approach allowing teachers to be actively part of providing for the content of the TPD; and 2.) whether TPD is conducted through a formal educational model or whether it also builds on learning in more informal settings through the use of educational technologies or Internet resources.

**A Theoretical Framework for TPD**

Focusing on the content and characteristics of TPD, there are several different positions to be noted. In her literature review, Villegas-Reimers (2003) gives broad background descriptions of different views on TPD. Starting in professional development, which is referred to as the development of a person in his or her professional role, Villegas-Reimers goes on to clarify TPD as the professional growth of a teacher as a result of gaining increased experience after examining his/her teaching systematically (building on Glatthorn, 1996). Professional development includes formal (such as attending workshops, mentoring, etc.) and informal (such as reading publications, watching documentaries, etc.) experiences (building on Ganser, 2000). When discussing a possible framework to examine TPD which includes several dimensions of TPD in the model Fraser, Kennedy, Reid, and McKinney (2007) suggest a joint framework of three different models. First mentioned are three interrelated aspects of professional learning as
they are suggested by Bell and Gilbert (1996): personal, social, and occupational. Second, using the analytical framework of Kennedy (2005) the purpose of TPD could be located along a continuum of being transmissive, transitional, or transformative. Third, from Reid’s quadrant of teacher learning (McKinney et al., 2005) two additional dimensions can be included: formal-informal and planned-incidental. Through these different models, a joint framework including several complex relations affecting TPD can be identified.

From the above, characteristics possible to include in a framework for a comparison of different models of TPD may be: formal-informal; planned-incidental; personal, social and occupational; and transmissive, transitional, and transformative.

**Methodology**

In this article, the study described uses a methodology that builds on case-study research (Stake, 1995; Yin, 2003). In accordance with Yin (2003), the rationale for a case-study strategy lies in its possibilities of answering questions of how and why when it comes to phenomena embedded in real-life contexts. In situations where investigators have little control case studies can thereby reveal something that was previously inaccessible. In the study described, this relates to the conditions and settings concerning teacher professional development when related to the use of ICT in two counties with large differences. A case-study design is intended to reflect the complexities this implies.

One issue to be considered in the design is how more than one case can be chosen and on what rationale the design and choice might build. Yin (2003) argues for choosing cases based on replication logic, strongly arguing that multiple cases not be chosen as a way of sampling cases. This implies that the design would follow the logic of multiple experiments. Cases must then be carefully selected so that they predict either similar or contrasting results. In both instances, Yin argues that the procedures should build on a rich theoretical framework stating the conditions for phenomena. Selecting cases on these premises is very difficult considering the cultural differences across countries. But, as Stake (1995) puts it, the real business of case studies is particularisations, not generalisations. This means that since the logic of experiments and control might be difficult as a point of departure for selecting cases, cases may be chosen on the grounds of particularization instead. The underlying rationale for the case-study strategy might then be to contribute with the kind of understanding Stake implies in stating “The function of research is not necessarily to map and conquer the world, but to sophisticate the beholding of it” (p. 43).

With this in mind, a multiple-case study approach (Stake, 2006) is adapted in which TETPD is considered the quintain (to use the phrase of Stake) to be studied using the different cases as its lever. The cases selected then all need to be studied in their situational uniqueness and complexity and to be selected for their individual possibilities to be both typical and atypical settings for TETPD. Following the three criteria for
selecting cases (Stake, 2006, p. 23) the cases chosen in this study: 1) are relevant to TETPD; 2) provide diversity across contexts of TETPD; and 3) provide good opportunities to learn about the complexity and contexts of TETPD. The cases in this article are described separately and some characteristics of TPD are compared. A full cross-case analysis will not be provided since first-hand empirical data from all cases are not yet available. The comparisons given in this article will serve as a framework for developing a full cross-case analysis in later stages of the study.

**Selection of Cases**

From the distinctions in the introduction, the cases selected for this multiple-case study are to describe different conditions and settings of TETPD. The selection is done using two dimensions of previous knowledge about TPD, illustrated below as a field. The field guided the selection of four different cases of teacher professional development. Primarily this is to provide cases that display differences on these dimensions in order to increase the possibility for cases of TETPD with diversity across contexts (see Figure 1).

**Figure 1: Two dimensions of TPD used for Selecting Cases**

The framework makes use of the distinctions given on the following accounts. First, the distinction between top-down models and programs and bottom-up models and programs is addressed. This makes possible including cases in which teachers’ use and control over the content and characteristics of the TPD can differ. Second, the issue of formal-informal models or programs is addressed. This makes possible including cases of TPD from very different parts of a teacher’s life, not only those that are clearly occupational but also those which may use out-of-school experiences and may be framed as informal or social in their character. In Figure 2 four cases of TPD are positioned within these dimensions.
The cases are described in the following sections.

**Case 1 — ITiS (National Programme for ICT in Schools)**

Initiated in 1999 by the government the National Programme for ICT in Schools (ITiS) ran until 2002 (Jedeskog, 2005). The programme was building on prior programmes of TPD using ICT, and facilitators in the ITiS-programme were recruited on their backgrounds from prior programmes. All Swedish schools were involved in the ITiS-programme. The programme consisted of seven components to improve teachers’ ICT literacy: in-service training; a multimedia computer for each participant; state grants to improve Internet accessibility for the schools; state grants to ensure all teachers and pupils having e-mail addresses; support for developing the Swedish Schoolnet and the European Schoolnet; special measures for pupils with special needs; and awards for excellent pedagogical contributions. Teachers and school managers were offered an ICT course to acquaint them with the potential use of ICT as an educational tool. All 289 Swedish municipalities chose to participate.

Training was to be flexible, in the form of intensive courses, study circles, or seminars. Training was to be held regionally, adapted to regional conditions. A management group, representing teacher training institutions, regional educational development centers, and local municipalities, coordinated a regional network. Training was offered for facilitators, principals, administrative heads, and politicians. Facilitators were to gain insights in how to chair seminars and to support teams of teachers in developing their learning. Training for principals was intended to give them insights into their role in implementation of development work in schools. The training consisted of both theoretical and practical parts. Practical parts were development projects carried out in teacher teams and with pupils. Theoretical parts were centered in three areas: ICT in the world; ICT and learning; ICT in practice. The in-service training was aligned with the pedagogical approaches set...
out in the national curriculum, such as a shift from teaching to learning, giving pupils more responsibility, interdisciplinary approaches to teaching in teams and a problem-based pupil-oriented pedagogy. Every teacher team summarized their work in a final report in order to reflect personal learning and development during the in-service training. Focus was on the team and not the individual teacher. Finding good models for in-service training was time consuming. Benefits from the ITiS-model were time for reflection and cooperation with colleagues in seminars. The basic requirements were team work, problem-based learning, and lifelong learning.

Case 2 — Lärarlyftet (“Lifting the Teachers”), The National Teacher Professional Development Program

In 2007 the government took the initiative to form The National Teacher Professional Development Program “Lifting the Teachers” (Ministry of Education, 2007). The programme is set to run from 2007–2010 and includes teachers working in almost all aspects of the Swedish K–12 school system. Improving schools is one of the major motives for the programme. The national evaluations conducted by the Swedish National Agency for Education indicated that the outcome of the students’ performance in several subject areas decreased in 2003 compared to the results from the 1992 and 1995 evaluations. As teacher competence is one of the most important factors in the student performance the government concluded that, therefore, the teachers were in need of TPD. The focus of the programme should be on teachers’ subject knowledge and their didactical competence, as well as other relevant TPD that might benefit student performance.

The TPD courses were not all given at all universities. The Swedish National Agency for Education Agency selected those universities and colleges with the best conditions. This meant that the courses had to be given in an open and flexible mode, allowing participants from many different regions of the country who are in need of specific courses. Many courses were to be given as distance courses using ICT as educational support. Teachers applied for the courses at the universities, but needed approval from their principals and municipalities before entering the programme. This also meant that while teachers had to search themselves for appropriate courses, but the final approval before they could start their TPD the municipality would have the final approval.

Case 3 — The Online Learning Community Lektion.se

Lektion.se is, according to the website (www.lektion.se), a web-based teaching material produced for teachers by teachers — a database of lessons and materials free for use where teachers voluntarily share among themselves. Lektion.se is the largest online community for teachers, teacher trainees, and other stakeholders in Sweden sharing an interest in the practice of schools. Established in 2003, originally this community was built in order to allow teachers to publish, search, and download lesson plans. Activities are provided free of charge, are member driven, and are flexible in time and space. The community also includes a database of work opportunities.
Different resources are provided for the members. Lektion.se contains an online forum where teachers communicate with each other and provides a way for publishing houses and other producers of educational materials to reach a large group of teachers. The forum contains almost 20 smaller sub-forums where for several years discussions have been available for members. The discussions in the forums are built up by threads, and every one can receive a notification of each new message in the forums one chooses to follow. Additionally, members can create their own pages and construct private networks or groups. With its concept and target group Lektion.se is a unique OLC in Sweden. Many groups of stakeholders of the Swedish schools are active in different discussions: teachers working in pre-school, compulsory school, upper secondary school, and adult education as well as school leaders and school politicians.

**Case 4 — PIM (Practical ICT and Media Skills, a service from the Swedish National Agency for Education)**

The Swedish National Agency for Education provides an Internet-based tool for Swedish schools in order to give them increased access to new tools in schools such as digital cameras, projectors, and other teaching resources on the Internet. The PIM brochure (www.skolverket.se) states that PIM offers the opportunity to enhance and broaden skills in the field of ICT use, both on one’s own and together with others. PIM consists of ten guides in which teachers with experience of working in schools describe how IT and media can be used. The guides cover different topics from mailings for a meeting with parents, search techniques, and source criticism on the Internet to compiling images and music to create slideshows. The guides provide step-by-step support showing how to work with computers. All sections have exercises which can be done alone or together with colleagues. As an Internet resource, the content in PIM can be studied whenever suitable. PIM also contains a study map, which shows different routes that can be taken through the courses, depending on what level of competence is strived for.

If a municipality wishes to implement more wide ranging skills for its staff, PIM can be used to give teachers the opportunity for examination in practical IT and media skills. Examinations take place under the auspices of the municipality and are attainable at five different levels: individual level, working group level, teaching in the modern classroom, resources for individual schools, and resources in the municipality. These examinations are based on both practical skills and theoretical knowledge. The Swedish National Agency for Education creates the examination environment for the municipality on the Internet and trains the future examinees.

By relating the cases back to the theoretical framework recognized above, the paper will end in a discussion of the possibilities for TPD enhanced by technology within each of these four different cases.
Comparing the Four Cases on some Characteristics

In an attempt to provide a further understanding of these four cases, the cases are related to some characteristics of TPD. In the framework for TPD, characteristics possible to include for a comparison of different models of TPD may be: formal-informal; planned-incidental; personal, social and occupational; and transmissive, transitional, and transformative. Another important issue to highlight is the primary technologies used in the case, making it possible to discuss each case as a case of TETPD. In Table 1, each case is compared on the selected characteristics.

Table 1: Comparison of the Four Cases

<table>
<thead>
<tr>
<th>Formal – Informal</th>
<th>Planned – Incidental</th>
<th>Personal, Social, Occupational</th>
<th>Transmissive, Transactional, Transformative</th>
<th>Primary technologies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case 1 ITiS</td>
<td>Case 2 Lifting the teachers</td>
<td>Case 3 Lektion.se</td>
<td>Case 4 PIM</td>
<td></td>
</tr>
<tr>
<td>Formal</td>
<td>Planned and incidental in that teachers themselves develop the content</td>
<td>Planned</td>
<td>Planned</td>
<td></td>
</tr>
<tr>
<td>Formal</td>
<td>Planned</td>
<td>Personal, Social, Occupational</td>
<td>Personal, Social, Occupational</td>
<td></td>
</tr>
<tr>
<td>Informal</td>
<td>Incidental</td>
<td>Personal, Occupational</td>
<td>Personal, Occupational</td>
<td></td>
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<td></td>
<td></td>
<td>Trans-formative</td>
<td>Trans-missive</td>
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<td></td>
<td></td>
<td>Internet-based online community</td>
<td>Internet-based, online tool, media technology</td>
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<td></td>
<td></td>
<td>Media technology</td>
<td>Distance education technologies</td>
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As can be seen from Table 1, the cases mirror different aspects of TPD. The most prominent differences are those related to the educational model used. Certain features seem to coincide, such as the case of TPD being planned and at the same time relying on a transmissive model. The cases also reflect different ways of working with the content of the TPD, and indicate the use of different technologies for managing the TPD.
Concluding Remarks

So, what could be the implications of these four cases and their potential as programmes or models of TPD aiming at enhancing the practice of teaching and learning and at the same time making different use of technology? Are they even examples of TPD? Are they examples of how TPD becomes TETPD, examples of technology use that might affect teaching and learning in schools more than others?

The case of ITiS seems to be such a model, where a government initiative provides a framework for the integration of ICT in teaching and learning leading to professional development at teacher level. The long-term effects of ITiS are yet to be investigated (a qualitative interview study is currently being undertaken to provide some insights into ITiS now almost ten years after).

The case of lektion.se has also several features that indicate a potential to be a powerful model of TETPD. What is yet to be investigated in the case of lektion.se are the effects of the teachers’ participation based on their school practice, i.e. their own teaching and learning. In the case of lektion.se, several studies are planned for in the project, both of teachers logged into the community and of teachers making use of the web site as a learning resource.

The case of PIM also seems to have potential as a model which could provide technology enhanced TPD for teachers and at the same time be aimed at the use of ICT and media in education. In the case of PIM, a quantitative survey is being conducted complemented by a qualitative interview study to better describe and understand how the online tool is being used and its effect on teachers’ work.

The case which seems to be most traditional and furthest from a TPD that might use technology to enhance the teaching and learning is the latest initiative Lifting the Teachers. In this case, features of the model are reminiscent of identified barriers of effective TPD such as being a top-down model based on a formal educational model with a focus on transmission of content. In the case of Lifting the Teachers, both a quantitative survey and a qualitative interview study are being conducted to understand better the use of technology in carrying out the program and in affecting teaching and learning in classrooms.

According to prior research, TPD anchored in participation, collaborative activities, and dialogue intertwine possibilities for professional development that offers a way to bridge theory and practice and to enhance teaching and learning. In the multiple-case study design of this project, cases which might be productive arenas for this purpose seem possible to identify. New arenas for integrating the possibilities that the technology of today affords with teacher professional development, such as the online learning community lektion.se, seems also possible to describe in terms of TETPD. Technology used to provide learning resources and TPD possibilities, such as PIM, might also qualify as an example of TETPD.
In this article, several enterprises in which technology as innovation seems to have a crucial place as both leverage and catalyst of change and as a pedagogical tool in itself have been discussed. Future work in the project includes elaborating on differences, similarities, possibilities, and constraints regarding technology enhanced teacher professional development, using further the potentials of a cross-cultural multiple-case study design.

References


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J Ola Lindberg is presently a postdoctoral research fellow at the Department of Education, Mid Sweden University, and his primary research interest lies in teachers’ professional development (TPD) and distance education supported by ICT. His research departs from a philosophical hermeneutical approach with an overall aim at understanding social and ethical processes of teaching and fostering. In TPD and distance education his focus is on how participants negotiate meaning and learn using technology. Between 2008 and 2010 he has been the scientific leader of the project “Technology Enhanced Teachers Professional Development in Sweden and in China,” a joint research project between Mid Sweden University and South China Normal University. He has contributed with book chapters, conference papers and journal articles, and has co-edited with Dr Anders D Olofsson the book Online Learning Communities and Teacher Professional Development. Methods for Improved Educational Delivery.