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# The Dilemma with ICT in Educational organisations

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**Abstract:** This paper is an outline of a research agenda concerning implementation of information- and communication technology (ICT) in Swedish schools. During the last decade the Foundation of Knowledge and Competence has spent nearly 150 million euros on its school campaign in order to build a better infrastructure for ICT in Swedish schools. The main purpose with these investments was to create conditions for a development of ICT in the school. When the implementation of ICT in school education takes place it becomes embedded in local and historical contexts. The construction of new practice as well as the reconstruction of practices can be understood only in relation to this embeddedness. From this starting-point questions are raised whether the ICT increases or changes the organizational control in line with the New Public Management (NPM) and what implications ICT has on the educational practice. In the paper we use the case study of the municipality of Stenungsund in Sweden in order to analyse the matters of technology, organization of professions and gender identity.

**Keywords**: Information- and communication technology, school organization, educational organization, educational practice, new public management, gender identity, practice, profession

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## GOVERNING OF PRACTICE AND GOVERNING AS PRACTICE

In this paper we will focus on two related issues. The first issue is about the connection between ideas about ICT in schools and NPM. During recent years the public sector in the OECD-countries have been the subject of a reformation process. The majority of these reforms include elements of decentralization, tighter financial control, customer orientation, outsourcing of services and the introduction of quasi markets within the public sector. The reforms are often summarized under the concept of New Public Management (NPM) (cf. Hood 1995; Zeuthen et al 1999; Walsh 1995). According to Power (1997) the development of the NPM movement can be attributed to three reasons; the need to decrease state expenditure, the rise of a neo-liberal ideology and finally a call for more intense economic control and governance of the public sector.

Brunsson and Sahlin-Andersson (2000) claim that publicly financed activities like schools are now restructured to become organizations with clear hierarchy, professional leadership and so on. Traditionally such activities have been organized more like arenas for the exercise of professional virtues they claim. In a study of the micro politics of schools Ball (1987) claims that traditional organization theory is unfit for the analysis of schools. Schools are special and cannot be compared with manufacturing firms for example. The current trends are changing this. The NPM reforms are generally aimed at increasing the control and governance of public organizations, which could be translated to the relation between the municipal government and the school activities. The municipal control is principally aimed at treating the school as a formal organization. It consists of giving guidelines for the administrative and pedagogical work at the schools and to establish the economical frames for the activities. During recent years the municipalities have aspired to improve the control of the schools, for example through various control and audit models (Power 1997; Sinclair 1995). This could be seen as an influence of NMP-ideas in the field of schools and education. We suppose that this development is affected by the implementation of new technology and that it has implications for the public administration of schools and the educational practice. This relation is however ambiguous and in the end there might emerge a more complicated pattern of connections between ICT and NPM.

The second issue is about the reconstruction of practice in education. The concept of practice has been used to define and categorize education in different work methods, documentation, control and acting in relation to artefacts and so on (Hasselbladh and Kallinikos, 2000; Miller and Rose 1990, Yakhlef, 1998). What happens when ICT is introduced in school education? Are the

educational activities and the professional's roles redefined? Through the practice perspective on change there is a possibility to analyse the implementation of ICT as a process where different practices with various form and content meet at the educational scene. To understand the concept of practice we also need to see professional roles, gender relations and technology as interrelated (Grint and Wolgar 1997).

Earlier studies (c.f. Parker & Dent 1996, Kurunmäki 1999, Preston et al 1992) show that even if new practices are established in public organizations it does not necessarily mean that they replace the former practice. Rather the final consequences can be seen as an effect of the coexistence of established and new practices (Hasselbladh & Selander 1999). The professionals face a situation where they must deal with existing practices as well as new practices. This new situation can create an increased action space. It implies that different practices embrace various models of governing and a situation of choice, but at the same time causes effects ranging from autonomy to disciplination (Rose 1995, Power 1997, Townley 1994).

Thus, the purpose of this paper is to discuss governing of practice and governing as practice. This means that the implementation of ICT can be seen both as a development of a new practice while at the same time acting as an influence for existing practices and as a tool for organizational control by the local government administration.

## THE CASE: THE GOOD INFORMATION SOCIETY

During recent years there have been extensive resources directed towards the development of ICT within the Swedish school system. The KK-Foundation (The Knowledge Foundation) is one example of an external financial resource that started its work in 1995 with an aim to extend the ICT resources for Swedish schools. The metaphor of a lighthouse is typical for all the levels in the KK-foundation spending. There were 27 municipals chosen for funding of extensive development projects. These projects were labelled as "lighthouse projects". They were deliberately dispersed over the country with the purpose of enlightening the neighbouring municipals and towns. Later another reform program was launched concerning all schools and their investments in ICT, called the National Action programme for ICT in Schools (ITIS). The budget of this program extended 150 million euros. Consequently large monetary resources have been put to work in ICT within the school system of Sweden.

Empirical studies on the implementation of ICT in Swedish schools have been made (Edström, 1998; Jedeskog, 2000; Riis, 2000). Their analytical focus has been to establish the rate and efficiency of ICT implementation. This study on the other hand has a focus on the meaning and consequences of ICT, emphasizing that efforts to implement ICT in school education are embedded in local and historical contexts. The paper is based on a case study in the municipality of Stenungsund. Stenungsund is a coastal municipality with approximately 21 000 inhabitants. The level of education is slightly above average while the level of income is slightly below average. Many of the inhabitants work within the petrochemical industry; while others commute to close by cities. The local government administration of the schools in Stenungsund is divided into three districts with relative autonomy. There are nine primary and secondary schools with approximately 4100 students from 7-16 years and roughly 350 teachers

The municipality of Stenungsund received some 1.5 million euros for the project, "The Good Information Society". A development project was started in 1997 and finished in 2000. The municipality was counter-financing the project with an additional 2.5 million euros. The overriding idea of the project was to "give the new information technology an active role within society". The development of ICT within the schools was interwoven with society at large and this was done with the help of local interests and partners, i.e. business, libraries, government etc. The purpose of the project was that the "knowledge houses" would be open to the inhabitants of the municipality and other interests. Another important objective was to change the teachers practice. There where 35 minor projects running within the major school project.

One example of a successful project that has been run within the municipality of Stenungsund relates to the pedagogical method of portfolio. The model has its origin in New Zeeland and focuses on documentation rather than on ICT applications. According to the model students are supposed to have a portfolio of previous performances. The portfolio can for example contain pictures from arts classes as well as essays and calculations. This allows for the appreciation not only of the students current standard in comparison to classmates, but also an evaluation of the path of individual progress. When this system for documentation was digitalised new qualities were added. The systematic of comparison could be made more advanced as it allowed for the different documents to be stored, classified and compared with greater ease and precision. New categories of documentation could therefore be included and the reading ability could be documented and traced through small sound tracks from grade one and forward.

Other projects have been oriented towards the education of different groups. Lectures were for example given to parents and grandparents. The argument was that it is not enough to introduce

new technology to teachers and students in school since the schools are also dependent on the trust and support from surrounding society. The organizing of the project embraces several management committees. There is a political committee for the ICT project within the municipality and the project also has an executive group with two administrators at the municipal office. One of these was responsible for competence development and the other was responsible for the technical development. The executive group of the project also has connection to three reference groups, one for technical matters, one for pedagogical and one representing union issues. All districts are involved in the project through the three reference groups. Connected to the project there has been four network administrators, dealing with both local and joint questions. In each school there has been an ICT representative that also acted as ICT educationalist.

Interviews with representatives from the local educational department in Stenungsund gave a picture of the introduction of IT as a matter of

- Some enthusiasts driving the development work and producing star cases
- A large group of followers or non-resistance
- A not insignificant group of non-followers

## THE DIFFERENCE ICT MAKES

ICT has been introduced in the schools of Stenungsund. What difference does it make? What aspects of the thing that schools do – or are supposed to do – are affected? We will analyse three different aspects; the expectations on technology itself, the reshaping of the organization of the professions and, finally, the issue of gender identity. But first a short discussion of what schools (are supposed to) do – the core practice.

### Core practice in Swedish schools

In order to understand the practice within schools in the western civilization and particularly Sweden it is helpful to have a picture of the institutionalised patterns that form the schools and the education they provide. We will here give a picture of how this can be comprehended.

The publicly financed schools in Sweden have a long tradition. Since 1842 there has been a compulsory school curriculum act (Utbildningsdepartementet, 1994), (Prahalad and Hamel, 1990, Prahalad, 1993). The curriculum act has been very delimiting up until the latest version. The shift to a new and more open approach to school practice came with the shift of funding authority for

the compulsory schools. Prior to the reform the funding authority was a central governmental body. After the shift the local municipalities have full responsibility. The formulations in the curriculum act are now very general and hence do not give much of direction, at least not in comparison to its rigid predecessors. Different pedagogical methods can be chosen and still be interpreted as being part of the curriculum. In this sense the strongly controlled school still prevail. The teachers carry the same tradition and they have the social tools to shape the schools. They are the interface between the organization, the institutionalised values, the current values of teaching and the students. Subsequently their interpretations are the predominant values diffused (Daft and Weick, 1984).

The schools in Sweden have been exposed to a variety of ideas that form education, i.e. Problem Based Learning, individualisation, etc, and now ICT (with it's many different pedagogical ideas) (Laurillard, 1993). Other reforms on a societal level have often had limited effect on the teacher body and subsequently the school.

The generic model of a school organization is to have a principal and one or more vice principals. The teacher is usually quite isolated in relation to colleagues. There have been reforms aiming towards teamwork but the traditional role of the schoolmaster still prevails in many senses. The team role does not necessarily affect the teacher's situation in the classroom. Even if most schools work with teacher teams, the cycle has been tough to break.

One finding from the municipality of Stenungsund was that the person responsible for ICT-pedagogic emphasised the difference between ICT and the core practise. The result of this partition enables the two to have separate budgets and even though the core practise has financial problems there is still some room for ICT.

> " If we integrate ICT within the core practice the risk that ICT disappears is obvious. One must nourish the dedicated areas otherwise they disappear into other activities." (Translated from Swedish, The ICT-pedagogue of Stenungsund)

It is also important to point out that a precondition for the funding received was that it would be invested in ICT related education or equipment. This has also been a subject for debate where many, not only school related persons, have had opinions about the investments in ICT when the financial situation, both for the schools and the community at large, have been that of a scarcity of resources.

Even though the tradition of the teacher trade is increasingly challenged by a multitude of new ideas and pedagogical methods it to a large degree prevails. In the professional thinking we have seen examples of delimiting thought of what can be done and what resources can be used for. However in practice we can also observe the opposite. Individual teachers with strong ideas are sometimes able to break the pattern and, still within the boundaries of the central plan, work with alternative practice and pedagogical methods.

**Expectations on new technology**

From interviews and literature (Grint and Woolgar 1997) there emerges a pattern of expectations, worries and some strategic thinking regarding the technological development. The implementation of ICT in schools could be a matter of sustainability. As the different sources for external funding of hardware and development work are drying out one could suspect that the new implants and shoots would fade away leaving a sad skeleton of obsolete computers and untraceable cable networks behind. This is an important concern for the KK-foundation. In Stenungsund it was pointed out that the funding for the lighthouse project was part of a long term strategy. Budgeting for reinvestment and maintenance continuity is an important evaluation standard for both parts. But continuity and sustainability might not be the same thing here. Sustainability requires a certain degree of discontinuity. Riis (1999.) presents a list of ideas or slogans about computers and schools in a succession from 1980 and forwards. This list suggests that ideas about computers in schools are to a high degree dependent on the supply on the general market. Sustainability could be the ability to adopt the discontinuities of the market, which might perhaps be a reflection of the technological development. Programming in Basic was popular in 1982, but no continuation of that practice is to be found in Stenungsund. This is happening again in Stenungsund in 2002. The distributed computing and storage power is now replaced by a more concentrated technology. The concept of "thin clients" is taking over in the classrooms. Some of the great pedagogical ideas will have to adapt. The content of the portfolios have to fit the contingencies of central storage. Some files like sound and video tracks will be left out and consequently the follow-ups will be less rich of aspects than originally hoped for.

One could easily be tempted to conclude that technology rules. Slogans, visions and practice about the development of schools could thus be dependent on current technology developments. The big effort by the KK-foundation to spread the new technology nationwide seems to be founded on a belief in the power of technology. But there is a strong will at the local level – at least - to see technology as a controllable tool. The former project manager of the lighthouse

project was assertive in an interview about this being a development driven by pedagogical needs and visions.

Legitimacy is won in the formal compliance to external pressure according to Meyer & Rowan (1977). In the case of ICT in schools there is the dilemma that it calls for a two-sided rhetoric. On the one hand you have to show that you are on the technology track using the latest – or at least not an obsolete – technology, but on the other hand it has to be founded on pedagogical needs.

If we analyse the adoption of new technology as a time-bound necessity the lighthouse projects and the visionary thinking in Stenungsund represent one of a number of possible ways of dealing with necessity. Being in the forefront is one possible strategy chosen by Stenungsund. Some interviewees attach the notion of forefront to technology itself while others tend to stress a more general idea of development intensity. The opposite way of dealing with new technology would be to be a late adopter. But coming very late is problematic. No school organisation could introduce programming in basic in the year of 2000. That was seen as old fashioned already in 1985. The time gap between "the visionary Stenungsund" and the possible latecomers adapting to time bound necessity could however be quite small, at least when it comes to the technology in use.

Another aspect of ICT in schools is that it is supposed to produce a new and more open classroom. McDonald and Ingvarson (1997) reported from an Australian case of computers in the classroom how certain behaviours became increasingly valued – "…risk taking, perseverance, initiative, creativity and group problem-solving."(523). The interviews in Stenungsund express the same kind of expectations about the pedagogical effects of ICT. Technology itself makes it necessary for teachers to open the classroom for cooperation with others. This is due to a new division of labour among teachers. Some of them specialise in ICT development and support. The students are affected by this new openness as well as by using technology itself. Technology is, according to some interviews, empowering the students to design their own learning agenda and to take charge of their own education.

In other sectors of society there is a concern about negative aspect of ICT contrary to the ideal of an open learning situation. In working life, as we know it from industry and commerce, computers can make man more subjected to control and less autonomous. The effects of information technology are going in two directions. One possibility is that future working-life will be more democratic and rewarding as a consequence of new technology (Grint and Woolgar

1997, Jones 1998). The opposite possibility seems almost as likely (Zuboff, 1988). Schools cannot possibly be an exception. ICT is a base and prerequisite for the standardisation and surveillance of some operations in school. The example with portfolios is not just an innocent case of quality improvement. It is also an example of more effective surveillance. The teachers are subjected to the same logic. ICT is the can-opener that opens the classroom where the teacher was formerly his own master. While most of our interviewees stress the freedom aspect of ICT some of the actual uses of ICT – like portfolios and a new division of labour – seem to be two-sided.

**ICT and the organization of professions**

The professional work groups in public organisations today face a new situation where they not only have to manage their traditional professional practices but also new NPM influenced control practices. This creates new conditions for the professional autonomy and control. The school is a professional activity that traditionally has been regarded difficult to control (Arfwedsson, 1983). The NPM program can be seen as an attempt to reduce the professional control and open up the 'black box' of public professional organisations. During recent years the municipalities have shown ambitions to improve the control of the schools, for example through various decentralized models (Power 1997; Sinclair 1995). The municipal control is principally aimed at treating the school as a formal organization among others, rather than as a professional organization with specific conditions and a specific societal importance. The investments of the KK-foundation and other similar investments could be a factor in the municipal control of schools.

There is an expectation that the implementation of ICT in schools should implicate everything from advanced technical equipment to a profound transformation of professional work methods and pedagogical conceptions (Riis, 2000). The development work that has been accomplished through the use of new information technology has among other things implicated attempts to try new pedagogical methods, changed work methods and a new work organisation. The question is if ICT has been integrated in the established school practices and the teacher's duties, and if so how this has been accomplished. The teachers as a profession are dependent on different kind of control mechanisms, both the municipal and administrative as well as the professional. It is therefore difficult to act as an autonomous group in a local context since they need to legitimise themselves both towards their profession and the municipal employer. Added to this is the governmental regulation through legislation and educational plans. At the same time the auditing and evaluation logic has become more prominent during recent years. Together this creates a complexity and difficulty to forecast the role of ICT in the creation of new conditions for the

teacher profession. The question is how ICT creates and facilitates different kind of practices and how they together constitute the professional teacher identity.

The implementation of ICT can imply both the strengthening of the teacher profession and the weakening of its societal status. The common conception is that teachers in general do have a limited knowledge about the new technique while the younger generations have grown up with computers and therefore have a more developed knowledge. If that is the case the investments in ICT could lead to a further weakening of the teachers authority. Or could this be regarded as a myth? There is also the notion that men are more familiar with ICT than women (See more below on gender). The preliminary case study shows some indications that the teachers view the new ICT as an opportunity rather than as a threat (even though there are exceptions). Some teachers look upon ICT as a new field where they can develop their profession. What is also of interest is that at the same time as there have been big investments in ICT technology in Swedish schools there has also been a development towards a new kind of teacher organization. This means that there has been an increased emphasis on opening up the classroom and making the teachers work in teams with clearly regulated working hours etc. It can be seen as an attempt to visualize the 'professional black box' of teaching and further the external control and auditing. However, it is vital to point out that the teacher profession has by and large tried to support this development as a way of developing 'the new teacher profession'. ICT could play an important role in the constitution of the team organization as the teams are usually responsible for the local implementation of ICT in the schools. This could be regarded as an example of a possible redefinition of the teacher identity, caused both by a more developed governance and control of the schools as well as by a professional strategy. The question is which consequences are created by this new school definition as a more governable formal organization. Even though it creates possibilities for the teachers to develop new teaching methods and visualize themselves at the same times it could create a self controlling and disciplining effect when they are made accountable for their work in a new manner (Rose 1995, Power 1997, Townley 1994).

**Expressing identity and gender**

Effects of the new ideas for governing are also discovered in issues concerning identity among the employees. In our case changes in identity that comes from the implementation of ICT is shown in gender related themes. Let us begin with a quote about gender differences in computer use:

> Lisa: "The big gender difference is shown in the students acting. Boys are often more keen to try the computer and uses it to test the limits of the adult world. Young boys try limits and this trying is now

> done with help from the computer. Some parents were really upset over some naked ladies. I do not think this was so bad, though."

This statement from one of our interviewees mirrors the typical picture given about the change that comes with the implementation of ICT in the school. In this study however, the students are not in focus. The statement is rather used to enlighten ideas about identity, which is revealed in the gendered situation among the employees.

In the growing field that comes from the development of new technologies, gender has become one of the many studied aspects. A common conception is that the internet provides opportunities to change and play with gender identities (Dietrich 1997/1998, Danet 1998, Kramarae 1998, O'Brien 1999). Another theme that reminds us of the statement above regards how girls and boys in school adopt, learn and use the new tools. There are several reports on how boys push girls off classroom computers and how quickly boys learn the new electronic teaching advices compared to girls, (which is also mirrored in the quote above). This gender related situation is also shown among the teachers, where for example science professors are assumed to have a bigger need for the newest computer equipment compared to teachers in nursing classes (Kramarae 1998).

In this case, gender identity is displayed in opinions about the male and female co-workers. As the quotes will tell, there are different ideas among the employees concerning what happens to the gender identity when ICT is introduced. The quotes are interesting when compared to the theory that assumes that the children interest in different areas is a result of the gender roles in the division of labour among adults (Bjerrum Nielsen and Rudberg 1991, Alvesson and Billing 1998). Hence from this perspective the quote above illustrates ideas about gendered identity among the adults. Gender identity in the working situation also seems to be relevant since when asked about how ICT affects different groups, all the interviewees comment on the situation concerning the male and female employees.

A female ICT-manager told us:

> "Men are highly represented in ICT. They who are interested in ICT are almost only men. We have five ICT-technicians and they have a financial space as a consequence of ICT."

She continued with the teachers changed identity:

> "Many male teachers gets a natural masculine development from the teachers tasks to the tasks of computer technician. This is a very positive development, since it confirms the masculine gender identity and creates a feeling of security."

Here the new science seems to contribute to separate masculine and feminine tasks, where the masculine tasks are technology oriented and feminine tasks seem to be the tasks of the ordinary teachers. With this view, the new technology does not challenge the gender equality but rather emphasizes what is generally thought of as traditional gender pattern. This is done by supporting a conventional masculine identity and by giving this identity even more space in the changed working environment. In the opinion of the interviewee this is a good development, which is interesting compared to the general societal gender ideology in Sweden.

Another woman who supports the idea about men and women as gender role models for the students gives her opinion:

> Have ICT influenced the groups in different ways?
> Mary: 30% of the employees are men at the senior level. On the lower levels, there are no male teachers. The men are important, they mean a lot for the technological development and for the balance. They should be encouraged to have meetings of their own and talk about questions that are important to them. ("Mary")

Once again we are told that ICT in school brings forward the possibility to find areas for men. George agrees with Mary that there are too few men but he also tells us that women are often more effective as computer users:

> George: There are altogether too few men in the school. When it comes to ICT men and women are equally skilled. Women are better in unpacking and starting a computer since they read the instructions. Men do not and get into trouble.

From this we are told that the idea about ICT in school not only gives financial space (to men) but also supports a masculine identity construction for men in the 'feminised world of the school'. However, it is important to notice that this is an idea among some people, since there are descriptions of women as ICT-responsible, as pioneers and as skilled computer workers as well. A man talked about the geographical differences when explaining that in the north all the ICT-responsible are men and there are only one woman in the department. In the south however, the opposite prevailed. When it comes to the situation among teachers the new technology seems to provide a gender (stereotyping) opportunity. An example of women as pioneers comes from a woman who told us:

> "I do not have a picture that the men have taken control over or found a role specifically within ICT. Rather, the pioneers and dedicated persons are usually women."

The differences in the answers can be explained by the hierarchical position among the interviewed. Distance to the operative level might produce images that are more an expression of a general idea about the organization rather than the actual situation. The differences also seem to be more related to geographical location and hierarchy rather than gender. This shows the importance of studying the micro-practice among the employees rather than taking their common images for granted.

The given example shows how the gender identity construction changes when ICT is implemented in the daily educational practice. The new roles are visible both in the employees practice, where men can get support for their masculinity, but also in the new employment roles that comes from the need of new technicians who govern the daily use of the computers. Taken together it seems like ICT constructs a masculine identity where adult men can find identity support and young boys (thus) explore cyberspace limits. There are some efforts to change this situation, but in peoples minds this seems to be the major opinion. Thus it becomes an example of identity transformation at the micro level (Ball, 1987).

In the few quotes given some tendencies appear but it also raises more questions. How does the implementation of ICT affect feminine identities, both among those who work with the new technology and among those who see male colleagues find a new identity with the change? What happens to the identity among male teachers who changes their teacher role for a more supportive one that follows the computer maintenance task? Will this open up a situation where women instead use the computer in order to develop the pedagogical forms?

## CONCLUSIONS

The school has sometimes been regarded as a very closed and institutionalised type of organisation with strong traditions and a resistance to change. The different discussion themes of technology, professions (work organisation) and gender identity all show a more ambiguous picture. Even though the teachers still teach in the classroom the conditions seem to be somewhat different. They have to adapt to the new ICT influences, they have to work in teams with other teachers, they have to assure and control the quality of teaching (by themselves and others) and at the same time uphold their professional and gender identity. It is a new and

complicated web of demands and pressures that might be more than the school organization can handle. Perhaps one of the most stabile and traditional public organisations, i.e. the school, finally is facing profound change.

The question of the team organizing of the teachers has been much debated in Sweden and there are those who claim that they have no or limited effect on the school practice. It is too early to say what will follow with the new organisation but it is quite possible that it can play a vital role in the opening up of the school and the classroom. The traditional role of the lonely schoolteacher is no longer taken for granted. An important aspect is that the forming of a team organisation could serve as an arena for several stakeholders. The municipalities see it as a way of increasing the visibility and control of the teachers work in the way that it makes the school more similar to other municipal organizations. The students and their parents see it at as a way of controlling the quality of the education while the teachers themselves see it as a way of gaining support from colleagues regarding ICT and other related matters. Team organization of teachers therefore serves as an example of the potential relation between NPM and ICT in schools. It is also possible that it could create a reorientation of practice or the addition of new practices in the school.

Technology itself is ambiguous. The expectations found among project leaders and school managers in Stenungsund are that ICT will help to create a new, and up to date pedagogic including things like group organization. The former project manager for the lighthouse project claims that the new technology introduced is making a difference of course, but the most important aspect is that new technology is triggering a development for pedagogical renewal. Technology is secondary. But the technology also bears the potential for extended surveillance and control which is not so much spoken about. One interpretation is that ICT will fit any or at least more than one agenda. There is a choice between using the computers as instruments for surveillance or as a tool for free gathering of information. Another interpretation is that technology will change things out of reach of those in charge. One example of this is the new distribution of work. The differences in competence and the subsequent specialization of some teachers seem to be unintended and inevitable consequences of the ICT introduction.

Another matter that might be significant is that the new technology is changing traditional patterns of gender and distribution of work. The interviews have given different pictures of how men or women respectively have taken the role of enthusiasts and driving forces for ICT. The implications are that ICT and the development projects on one hand have contributed to a regression and cementation of traditional gender patterns and on the other that the same

technology and development is a facilitator of new opportunities for gender equality. It is difficult to see a clear tendency in the construction of gender identity related to ICT but it opens up for future developments. ICT can make the school more technical, which would favour the traditional male values but it could also be an opportunity for new pedagogical solutions favouring the female teachers. The more profound question is how ICT in the school is tightening or loosening the restrictions put on individuals by gender stereotypes.

The agenda of NPM is not only to seize power though. It is also about defining a distinct direction. If the schools become more manageable the question of steering in the right direction remains. The core practice is in effect a discourse about what schools are supposed to do. The question remains if no one has a suggestion of a new direction. We have heard very little of that. Visionary thinking is not abundant which might leave a vacuum for school management. Cutting costs for a well-defined activity is in accordance with NPM but cutting costs doing something unspecified new and important is beyond its capacity. New ideas about what ICT enables schools to do about their core practice could be more threatening for the order of governance than the relative autonomy of the schoolmaster ever was.

In this paper we have discussed three themes for further studies and analyses - technology, organization of professions and gender identity. What can they say about the two general issues about the relation between ICT in schools and NPM and the reconstruction of practice in education? The core practice of schools seems to be teaching in classrooms. The struggle to control and govern the schools has been between the professional autonomy of the teachers on the one hand and the wish to make the schools more transparent and manageable on the other. Earlier attempts to change this practice have not been that successful. Different visions and utopias of a new school founded on the use of new technology seem to have limited effect on the taken for granted conception of school education. The generic perception of what schools do has been strong. At least in the short run. But ICT could be the instrument needed for change, along with other influences such as the forming of work teams and the increased audit control. Large-scale utilisation of information technology might be the opportunity the adherents of new public management have waited for. It opens the classroom and threatens the professional autonomy. Controlling the schools would be that much easier with a less autonomous and less homogeneous work force.

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