



Digitalising Schools - the Challenge of Building Educational Environments for the Future

Bente Meyer, Mads-Bo Kristensen

bm@dpu.dk, madbo@vejle.dk

Aarhus University Denmark, Vejle Digital Schools (Denmark)

Abstract

This paper will focus on the process of digitalising schools as an innovative education strategy. In the paper we shall focus specifically on teachers and how teachers can be implicated in educational innovation that involves digital media. The paper draws on experiences from an ongoing project in Vejle, Denmark, where 40 schools highlight ICT use, culture and diversity in the knowledge society School (<http://www.vejledigitaleskoler.net/>) Based on our experiences from the Vejle Digital Schools project and existing research literature, we argue that teachers have a central role in implementing educational transformations involved in the digitalisation of schools, but that teachers are also often hesitant towards the pressures of adopting change. One aspect of teachers' reaction to the digitalisation of practice is a feeling of losing control (e.g. with what pupils are learning) as ICTs are often conceptualised as media that are mastered by the pupils. In addition to this, loss of control seems to be intimately connected with the idea that technology will fail, i.e. that technical failure is a natural consequence of involving ICTs in education. Finally, teachers' reaction to the loss of control involved in the transformation of practice may be affected by the fact that ICT strategies in education are generally implemented as part of national education policies rather than local and practice based educational development.

In the paper we shall argue that the problem of mastering teaching and learning is central not only to the digitalisation of education but to teaching as such, and that most teachers have experiences with coping with loss of control as an element of practice. Thus we see technical problems and loss of control as potential points for reflection on and transformation of practice that should be incorporated into innovative school developments such as the Vejle Digital Schools initiative.

1. Introduction

Strategies for the implementation of ICT in schools are closely connected with the emergent information and knowledge society and are positioned at the frontier of educational innovation. In this sense The Digital School represents a tremendous educational and organizational potential. The educational success of this school may, we shall argue, depend on two factors: 1) Managing to free teachers' time to do relational work in teaching and to engage in reflective development of their teaching 2) creating promising mixtures of face-2-face and virtual teaching and learning. The first will be required from the relationally professional educator, i.e. the teacher. The latter will be required by the knowledge society. In this paper we shall argue that teachers are central to the processes of change involved in digitalising schools. Teachers are often understood to be hesitant towards change, specifically change that involves new technologies ([2], [10]). However, teachers' response to the processes of change may depend on how technologies are understood and on how they intervene into teachers' practices. As suggested by Bryson & De Castell ([2]) teachers' resistance to becoming competent users of educational technologies may include "a well-hewed skepticism toward faddish educational "innovations of the moment", lack of direct hands-on experience with new technologies, and an adaptively cautious response to the challenges posed by an already over-loaded work-related agenda" (548). In addition to this, research suggests that teachers need to experience that ICT brings a positive change into their teaching if they are to use technology ([3]).

In this paper we shall focus on the teachers' role in and response to the digitalization of schools in connection with a specific innovation project in a Danish municipality, Vejle Digital Schools. In the paper we shall argue that one aspect of teachers being at the centre of school transformation is an



articulated feeling of loss of control which may be a result of how ICT is understood (i.e. as pupils' rather than teachers' tools or as unreliable technologies) or of how ICT is distributed and integrated into schools (i.e. through top-down processes defined by politicians and administrators or bottom-up processes involving teachers' experience of practice). We propose that what schools have to offer is a professional and practice based knowledge of teaching and content skills, and that teachers' professional knowledge and agency should therefore be at the centre of transformation processes involving ICT.

2. Vejle Digital Schools

Vejle is a municipality in Jutland in the western part of Denmark. Vejle Schools are currently working with a large development project which involves teachers, school leaders, pupils, parents and politicians (www.skolenibevaegelse.nu). The intention of the project is to explore and create the first pointers as to how the school will move in the next few years. In this framework, schools have worked with a number of subprojects. Most recently, focus has been put on The Digital School as a framework for the opportunities and challenges for schools in the knowledge society.

Vejle schools have joined together in a network, Vejle Digital Schools (<http://www.vejledigitaleskoler.net/p/e-n-g-l-i-s-h.html>). The network consists of 35 elementary schools and 5 special needs schools. There is consensus among the schools that ICT is currently not a sufficient part of educational practices. At the same time, schools have realized that future education is closely related to the pedagogical and organizational potential of The Digital School. On this background the schools focus on the following question:

"What will it take for ICT to become a part of educational practice - and how can ICT be maintained in practice?"

To answer the question, Vejle Digital Schools has identified three areas as particularly significant. These are areas that also represent the challenges (or barriers) which schools are currently experiencing and which affect the ways in which teachers can take up and develop ICT in their teaching:

- Use of ICT
- ICT culture
- ICT complexity

Vejle Digital Schools are jointly preparing a digitisation strategy designed to make ICT an integral part of practice. The strategy has headers, which must meet the above three challenges:

- Infrastructure and ICT equipment
- Digital learning resources
- Digital communications and knowledge sharing
- Leadership and management
- Development of technological and educational competency.

In the following, we shall discuss the role of teachers in digitalising schools in relation to the challenges suggested above.

3. ICT use

Accessibility is often identified as a key element in the integration of ICT in education. From a policy perspective the use of ICT is often seen as directly related to the distribution of hardware and software. Policy initiatives therefore seek to establish direct chains of connection between distribution, accessibility and use. However, putting hardware and software into schools is not the same as incorporating it into teaching ([7]). One of the barriers for using accessible ICT may be the fact that administrators and teachers are not speaking of the same thing when they talk about ICT. Ottesen for instance argues that for teachers ICT is a phenomena that is "historically contingent, socially enacted, culturally constructed" ([10], 277). This entails that ICT should be understood as tools that are contingent with and situated in practice. Similarly, Bryson & de Castell argue that discourse used by administrators about ICT may seek to manage the lived reality of schools in ways that alienate teachers to technology. In this sense ICT policy may not be contextualised for teachers.



The first challenge of digitalising schools therefore relates to the school's use of existing ICT. Although a school has all (or almost all) the equipment required, school leaders and teachers may feel that ICT is not a natural part of everyday life in the school and that the actual ICT use represents only a small part of the teaching and learning that takes place in and around school.

Sensible or rational use of ICT attaches value to decisions taken for the concrete, measurable changes in teaching and learning practices that are significant for teachers. Such an approach helps to ensure that schools obtain the ICT that is needed. This approach may also ensure that the technology acquired is actually used and that schools are given the educational and economic value associated with the innovation strategy. Finally, the approach appropriates skills development strategies and ICT support strategies.

4. ICT culture

Tondeur et al [12] argue that in integrating ICT in schools the role of teachers as individuals and the characteristics of the school culture must be seen as interacting. Research shows that both the readiness of schools to adapt change and the role of teachers as entrepreneurs affect the ways in which ICT is used in schools ([12], [3]). Culture is for instance norms, habits and customs. A school's ICT culture is seen in the basic assumptions, values and artifacts ([11]) that school leaders and teachers share in relation to ICT. If the culture of ICT use is not nurtured and developed, real changes and improvements of teaching and learning environments may not emerge.

Jensen argues, on the basis of a study of Danish teachers' response to the use of smartboards in class ([5]) that school cultures (and curricula) often focus on pupils' goals for learning and not teachers'. Her research shows that when teachers engage in teaching processes with smartboards they generally experience a loss of control that is related to their established role as authorities in the classroom, and as classroom managers. This is supported by other research, for instance Grey et al. [4], Wagner [13], Meyer [8]. In relation to her study Jensen suggests that this feeling of loss of control should be understood as an opportunity for change and for teachers' learning. We also suggest that teachers, through their practice, are experienced with coping with loss of control. Thus we see the loss of control as potential points for reflection on and transformation of teachers' practice that should be incorporated into innovative school developments such as the Vejle Digital Schools initiative.

5. ICT complexity

The third challenge is about the ever-increasing ICT complexity. The number of ICT genres or forms have grown substantially in recent years. This began with the Internet's educational breakthrough at the start of the millennium. The individual school and its teachers cannot possibly integrate all ICT forms equally. In addition to this different ICT genres or applications may be understood as associated with different kinds of teaching. Drent & Melissen for instance propose that "when only one application is used it is less likely that the teacher educator had integrated the use of ICT in support of a student-oriented arrangement of education" ([3], 191). This supports the argument that teachers must engage in multiple ICT genres and platforms.

Schools, its leaders and teachers should view the digital dimension of education as a complex field of constant change. This approach provides school leaders and teachers with the opportunity to act in the complex field that the increasing number of ICT genres represent. Schools, leaders and teachers must realise that they cannot be in control of everything and that they constantly need to make a wide range of choices. This exploratory and knowledge sharing approach to The Digital School is indispensable if the ICT genres that constantly show up should be made part of educational practice. This approach is inspired by systems theory ([6])

6. Conclusions: ICT and relational competence

Teachers' feeling of loss in connection with the incorporation of ICT in schools may be a sign that teachers' agency and professional knowledge has not been sufficiently integrated in the transformation processes involving ICT in schools. This may be due to a deskilling of teachers brought on by for instance standardised tests, detailed national curricula and educational reforms ([1], [2]). The digitalisation of schools can in this way work against teachers' professional knowledge, or it can rely on teachers' knowledge and skills – as well as their learning – for the development of innovative



teaching and learning. As mentioned above, we feel that one of the advantages of successfully integrating ICT in schools is that ICT has a potential to free teachers' time to do relational work in teaching and to engage in reflective development of their teaching.

References

- [1] Anderson-Levitt (2003) (ed.) Local meanings, global schooling: anthropology and world culture theory. Palgrave McMillan
- [2] Bryson, M. & De Castell, S. (1998) New Technologies and the Cultural Ecology of Primary Schooling: Imagining Teachers as Luddites In/Deed. Educational Policy 12
- [3] Drent, M. & Meelissen, M. (2008) Which factors obstruct or stimulate teacher educators to use ICT innovatively? Computers & Education 51
- [4] Grey, C., Pilkington, R., Hagger-Vaughan, L. & Tomkins, S.A. (2007) Integrating ICT into classroom practice in modern foreign language teaching in England: making room for teachers' voices. European Journal of Teacher Education 30, 4.
- [5] Jensen, T. (2010) Interaktive tavler i skolen: kontrol og kontroltab (Interactive whiteboards in schools: control and loss of control). Dansk Pædagogisk Tidsskrift 4
- [6] Luhmann, N. (1995) Social systems. Stanford University Press
- [7] Mayo, M.J. (2010) Bringing game-based learning to scale: the business challenges of serious games. International Journal of Learning and Media 2, 2-3
- [8] Meyer, B. (2009) Læring på spil - læringsspil og didaktisk design (Games and educational design – how to learn with games) Dansk Pædagogisk Tidsskrift 4
- [9] Mossberger, K et al (2008) Digital Citizenship: The Internet, Society and Participation. Massachusetts Institute of Technology
- [10] Ottesen, E. (2006) Learning to teach with technology: authoring practiced identities. Technology, Pedagogy and Education 15, 3
- [11] Schein, E.H. (2010) Organizational Culture and Leadership. SF: John Wiley & Sons
- [12] Tondeur J., Valcke, M. & van Braak, J. (2008) A multidimensional approach to determinants of computer use in primary education: teacher and school characteristics. Journal of Computer Assisted Learning 24
- [13] Wagner, J. (1990) Kommunikative spil i fremmedsprogsundervisningen (Communicative games for foreign language education) Ålække