SCHOOL ORGANISERS' WORK WITH EXPANDING THE ACCESS TO AND APPLICATION OF DIGITAL TECHNOLOGIES IN SCHOOLS

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Abstract

Digital technologies change the conditions of people's lives worldwide, requiring new skills for citizens. Students need to be prepared for these changes, and the educational system has an important task. Expanding the access to and application of digital technologies in teaching and learning is a school organiser and school leaders' issue. School leaders are responsible for creating opportunities by supporting teachers to access and applicate digital technologies in teaching. At a municipality level, school organisers are responsible for supporting school leaders in creating infrastructure for digital technologies in schools. Therefore, school organisers' leadership is crucial for digitalisation work in schools.

Introduction

Digital technologies have been the engine for many changes in societies in the last few years. As industrialisation in the middle of the 1900's, digitalisation has brought many challenges and opportunities to people's lives. It changes the labour market, creating a need for other skills involving necessary educational changes. In 2017, the Swedish government presented a digitalisation strategy (Swedish Association of Local Authorities Regions, 2019) as a way to meet these changes and prepare students with skills for using digital technologies. However, it increases the need for organisation and leadership to govern the digitalisation work in education, which is a school organiser and school leaders' issue. School organisers need to support municipality schools in creating an understanding of the impact of digital technologies in teaching and learning.

In education, digital technologies are connected to the economy since it brings high costs for both school organisers level, and school leaders (Hylén, 2011; Håkansson Lindqvist, 2015; Salavati, 2016). Purchase of hardware and software and Wi-Fi are some of the needs that are included in the infrastructure that the municipality needs to build for the schools. There is also a need for digital competence for students, teachers, school leaders, and school organisers (Håkansson Lindqvist & Pettersson, 2019; Ilomäki et al., 2016). Digital technologies bring changes in methods, creating

a need for digital competence and understanding on how digital technologies can be used in education.

School organisers work strategically separated from the operational part of the chain of command (Elmore, 2004; Lindensjö & Lundgren, 2014), which means that they are not physically in the schools, even if they have ongoing contact with the school leaders. Their strategic plans and decisions should seep down to the schools and the classrooms, supporting teachers in teaching and learning and creating opportunities for students to increase their digital competence.

In order to understand how school organisers handle changes in the educational system, the organisation of digital technologies in education is studied in three Swedish municipalities. This paper presents some of the preliminary findings of the collected data. The disposition of this paper follows a research review of the changes that digitalisation in education brings, preliminary findings, and discussion and conclusion.

Digital Technologies in Education

The access and application of digital technologies in society have expanded over the last few years, requiring students' preparation to meet these changes since digitalisation may not be stopped. Blossing et al. (2014) stress that education is an important competitive factor for the individual, increasing pressure within the labour market. Digital technologies bring challenges and opportunities for teachers, school leaders, and school organisers and should be used in teaching and learning as well as for administrative tasks. Examples are: recruiting qualified teachers, opportunities for competence development, and participation in collegial learning. Various reforms focusing on digitalisation in the educational system have been an important issue in many countries. The last digitalisation strategy for schools in Sweden was presented in 2017 (Swedish National Agency for Education, 2019). The decisions that school organisers and school leaders need to make between different choices, for example, platforms, systems, hardware, and software, require digital competence and understanding of digital technologies in education. According to Gallud et al. (2022), hardware and software user interfaces and their friendliness in education have been challenging since digital technologies' impact on teaching and learning is difficult to make visible.

Digitalisation work in education requires organisation knowledge (Somekh, 2008) and dialog (Ottestad, 2013) in the chain of command. Technology integration is not yet achieved systemically or systematically in most schools, according to (Lim et al., 2013). The scholars explain that "very few schools can be labelled as learning organizations with a shared commitment to technology in education" (Lim et al., 2013, p. 65). The organisation of digital technologies in schools requires leadership

(Grönlund, 2014; Hylén, 2011; Leithwood et al., 2020), which is considered crucial to a school's success and educational change (Bryk, 2010; Elmore, 2004; Fullan, 2007; Harris & Spillane, 2008; Stoll & Louis, 2007). It also requires digital competence (Håkansson Lindqvist & Pettersson, 2019). School organisers' competence to lead the digitalisation work, offering support structures for the technological and pedagogical work, calls for digital competence (Fransson et al., 2018). School organisers' digital competence is also defined as their confidence to lead the digitalisation work creatively (Ferrari, 2012). Bulman and Fairlie (2016) point out that students' outcomes may be affected by how school organisers organise and lead the expansion of digital technologies in schools.

Littlejohn et al. (2019) emphasise that school organisers need the knowledge to organise digital technologies in schools, which they may get by cooperating with each other in a network, sharing knowledge and experiences. School organisers should be able to learn from others and be open-minded (Leithwood et al., 2008, 2020) for organising and leading the expansion of the access to and application of digital technologies in schools. School organisers' digital competence may increase through a network between school organisers.

The school development work should come from the local school's needs, such as important features of the context, location, and school's trajectory for work with school improvement, according to Hallinger and Heck (2011). These scholars suggest that an important factor for change in the school's possibility to improve is solid learning-directed, collaborative leadership. Hall et al. (2017) point out that the chain of command in the educational system is characterised by a hierarchical structure. The scholars also stress that, even in a context "with one school leader and a varying number of teachers" (Hall et al., 2017, p. 327), the focus is on the leader because the leadership is not shared. However, Liljenberg (2015) argues that "leadership is considered to be significant for creating a developing and learning school organisation" (p. 152). Avidov-Ungar and Shamir-Inbal (2017) stress the role of digital technology coordinators that support schools in implementing digital technologies in education from a proactive perspective. Even school organisers' behaviour toward digital technologies in education influences digitalisation work. School organisers' attitudes (Hirsh & Segolsson, 2019; Mingaine, 2013) toward applying digital technologies in teaching and learning influence how teachers and school leaders prioritise digitalisation work.

Method

The data were collected within the framework of the project Digitalisation in the Educational System in Municipalities, shortened to DUVKOM, a network between three municipalities in Sweden and Mid Sweden University. The municipalities are identified as A, B, and C in this paper. Participant observation is the first approach

used to collect data, meaning that the researcher participates and documents the observations (Cohen et al., 2011). The project's reference group had nine participant observations between November 2018 and February 2022. At each meeting, about 12 participants attended, and it lasted approximately three hours. During the meetings, each municipality presented the status of its digitalisation work. Six meetings were conducted via conferencing service due to the pandemic. The second approach was a survey sent to 156 school leaders from preschool to upper secondary school in the three municipalities. The questions were built on findings from the project's meetings and the research questions. The themes in the survey were access to and application of digital technologies, digital competence for school leaders and teachers, school activities digitalisation plan, and school leaders' collaboration with school organisers. About 62% of the school leaders answered the survey. The third planned data collection method was group interviews with four school leaders' for preschool, year 0-6, year 7-9, and upper secondary school. The questions were connected to findings from the project's meetings, the survey, and the research questions. In total, 669 pages have been analysed.

The data have been analysed with the practice architecture (Kemmis et al., 2014). In order to understand the school organisers' digitalisation work, which can be seen as the project in the practice architecture, the school organisers' sayings, doings, and the relation between these sayings and doings are studied. The theory makes it possible to move the focus from the individual to the how the individuals act in a specific context, considering the external and internal conditions. Three different kinds of arrangements are identified in the theory of practice architecture: the cultural-discursive arrangements that shape the sayings in the semantic space, the material-economic arrangements that shape the doings in the physical space, and the social-political arrangements that shape the relatings in the social space (Mahon et al., 2017). These arrangements enable and constrain "preconditions for the conduct of practices" (Kemmis et al., 2014, p. 31).

Preliminary Findings

This section presents the preliminary findings according to what emerged in data analysis when school organisers organised and led digitalisation work in municipality schools. These findings are presented in this paper in the form of themes that school organisers often return to when they express how they work to expand the access to and application of digital technologies in municipality schools. The lack of enabling resources can lead to constraining the digitalisation work. For example, the lack of support from the school leader may constrain teachers' work in digitalised teaching.

Communication

Communication in the chain of command is important for digitalisation work. According to the school organisers in the network, the digitalisation work needs time and endurance and must be communicated to school leaders and teachers openly and transparently, which is affected by the municipality's size. Digitalisation "does not happen from one day to the next day" [Municipality C, 22 June 2021]; (note that here and elsewhere translations from Swedish are those of the author.). They point out the importance of *daily dialogue and reflections* on the application of digital technologies in teaching and learning. Municipality A stresses that they work with trust-based governance and trust-based follow-up, which is a perspective shift towards "several follow-ups of dialogues" [7 December 2020].

School organisers and school leaders agree that teachers' *attitudes to digital technologies in teaching and learning* are important for involving students in using digital technologies in different ways. At the same time, school organisers' and school leaders' interest in expanding the access to and application of digital technologies may influence teachers' attitudes to digital technologies in education. Municipality A comments that "attitudes are essential when we talk about using digital technologies in classrooms" [20 August 2020].

Equality in and between schools is not only about how much teachers and school leaders get access to digital technologies, but it is also about digital competence for the application of digital technologies. According to a Municipality B, equality in the municipality "has looked incredibly different and unequal" [17 February 2021]. School organisers describe one way to create equality between teachers' digital competence: to find a minimum common denominator that raises with time and has mandatory elements for everyone. They point out that it is essential to see the schools' digitalisation as a well-integrated work into the pedagogical work. Municipality B stresses that "a leadership that does not understand the digitalisation's opportunities may lead to equality not being achieved" [17 February 2021].

Leadership is crucial for the organisation of digital technologies in education. Since every municipality has different conditions, the organisation of digital technologies in schools is different. In two municipalities, IT strategists work directly with teachers, school leaders, and school organisers. They become a link between the strategic and operational parts of the chain of command. However, Municipality A points out that "there is no one responsible for digital technology issues in the municipality" [7 December 2020]. It is also important to lead the *systematic quality work* on a municipality level, increasing the *holistic perspective*, creating a *gold thread* in the municipality schools' digitalisation work. According to Municipality A, the systematic quality work is intended to "function as a type of engine for the development work in the municipality" [7 December 2020].

Increasing access to digital technologies in the educational system leads to *high costs for school organisers.* Even the application of digital technologies in teaching and learning brings cost in the form of needing digital competence. It is also about conditions, opportunities, technologies, resources, and sustainabilities. Unfortunately, the access to and application of digital technologies have been unequal in and between schools. In many cases, even the application of digital technologies in teaching and learning depends on teachers' interest in digital technologies in their subjects.

In summary, the lack of dialog and trust may influence the collaboration among teachers, school leaders, and school organisers. The municipality's size may enable or constrain the dialog and trust in the chain of command. School leaders' and school organisers' attitudes to digital technologies in teaching and learning may enable a more positive digitalisation culture in teaching and learning. School organisers' attitudes also may enable or constrain access to and application of digital technologies in education. A negative attitude leads schools with school leaders who are not interested in digital technologies in education to differ from schools interested in digitalisation.

Digital Technologies

The purchase of *hardware and software* influences how much digital technology will be used in teaching and learning. Municipality C emphasises the importance of clear instruction on how, for example, Chromebooks should be used and maintained. The risk is that with a lack of instructions many teachers avoid the implementation of Chromebooks in teaching. According to Municipality A, the municipality schools have been using a platform following students' learning development; however, the platform offers Swedish and English as languages for communication, which is problematic since many schools have parents who do not speak these languages. Implementation of systems and platforms demands leadership, "a leadership that may not understand what digitalisation brings in education, perhaps equality will be improved but does not achieve the goal" [Municipality B, 17 February 2021]. Also, using a system where interfaces are difficult to use or not adapted for schools may increase inequality in and between schools since the system may not be used as is intended. Teachers' and school leaders' understanding of the concepts used to document in these systems may also influence equality.

Increasing teachers and school leaders' digital competence is a prerequisite for expanding the access to and application of digital technologies in education. In schools, digital competence is a key to teachers applying digital technologies that benefit students' learning and development. The school organisers' and the school

leaders' digital competence and understanding of different systems influence the digitalisation of the educational system. Municipality A emphasises "digital competence as the form of knowledge to communicate the importance of implementing digital technologies in schools to local political representatives, not just understanding and supporting school leaders" [7 December 2020].

The school organisers have *employed IT strategists to support teachers and school leaders* with the expansion of the access to and application of digital technologies in education. These IT strategists work in both the strategic and the operative group, building a bridge between school organisers and schools from the digitalisation work perspective. These strategists are teachers and school leaders with both pedagogical and technological knowledge. They "stand for the part in relation to digital technologies" [Municipality C, 17 February 2021]. Both municipalities' and schools' economies enable or constrain access to digital technologies in schools. Without financing, the school organisers and school leaders have difficulty buying hardware and software.

Relationships

Collaboration between the IT department and the school department is important. The findings show that the school organisers form the link between the IT department and schools; it is important for the pedagogical perspective to be the starting point for implementing digital technologies in schools. To enable work requires collaboration between decision-makers for both school administration and the IT department. Municipality C points out that "the school should describe what they need, not the IT department" [7 December 2020]. According to Municipality A, there has been a field of tension between the school department and the IT department since they have different interests. The school organiser stresses that "it is a challenge, what role the IT department should have around the schools' digitalisation work, for example, as a core or support activity" [Municipality A, 7 December 2020]. Municipality A also emphasises that it is a classic discussion in all municipalities.

According to Municipality C, when the municipality talks about equality from a school organiser's perspective, they relate it to the national *steering documents*, such as the national digitalisation strategy and curriculum. Municipality C emphasises that every school leader is responsible for presenting a digitalisation plan for their school, "which is a good tool for us to talk to the school leaders, but the gold thread is the curriculum" [28 April 2021]. Working between teachers, school leaders, and school organisers to fulfill the government's digitalisation strategy requires a good relationship between partners in the chain of command and with the IT department.

A shared culture between school organisers enables the digitalisation work in their municipality schools. Even the digitalisation strategy focuses on what the municipalities and schools should do, enabling expanding the access to and application of digital technologies in education.

Discussion and Conclusion

The school organisers emphasised that communication in an organisation for expanding the access to and application of digital technologies in education should be open and transparent, which Ottestad (2013) also emphasised. Attitudes about digital technologies are important for schools' digitalisation work and may both enable and constrain the access to and application of digital technologies in education. Even school organisers' and school leaders' behaviour toward digitalisation influences the digitalisation work, which is in line with the thinking of Hirsh and Segolsson (2019) and Mingaine (2013) around school leaders' and school organisers' attitudes.

Expanding the access to and application of digital technologies in teaching and learning requires an organisation that supports the changes that digitalisation brings, which Somekh (2008) pointed out as important knowledge for the digitalisation work. However, precis as Grönlund (2014), Hylén (2011), and Leithwood et al. (2020) pointed out, creating an organisation requires leadership. To lead the digitalisation work, school organisers and school leaders need digital competence (Håkansson Lindqvist & Pettersson, 2019) and to understand how digital technologies influence teaching affecting students' lives. Working systematically and creating a gold thread supported by a holistic perspective require leadership and understanding of the impact of digital technologies in education.

Purchase of digital technologies entails costs for both municipalities and municipalities' schools, which Hylén (2011), Håkansson Lindqvist (2015), and Salavati (2016) stated. The economy enables the purchase of digital technologies from schools' needs and conditions, increasing equality in and among schools. However, it is important that school leaders and school organisers agree on which purchases should be made on the municipality's level and on the school's level. In addition, the school forms may have different needs and conditions, influencing equality between schools in a municipality. For example, preschools may have needs different from those of other schools.

Concerning the school organisers' doings and the material-economic arrangements in the physical space, hardware and software are important since how easily they can be used may enable or constrain the application of digital technologies in teaching and learning. The interfaces of software may influence whether digital technologies will be used in teaching and learning and how they will be used,

influencing equality in municipality schools. When purchasing hardware and software, school leaders and school organisers must ensure that the interfaces suit the purpose and that teachers have the digital competence they need to use the new digital technologies. It is not an easy issue, which even Gallud et al. (2022) emphasised. School organisers talked about increasing students, teachers, and school leaders' digital competence. However, even the school organisers' digital competence is important for a successful digitalisation in the educational system from an economic, pedagogic, and technological perspective.

The cooperation between the education and the IT departments is important, and it is connected to relationships and social-political arrangements. These departments should be able to work together and not be two downpipes. There is a need to understand each other's departments by learning from each other, which Leithwood et al. (2020) pointed out is vital for organisation and leadership. The scholars raised networks as a way to share knowledge, which was also highlighted in this study. The network allows school organisers to increase knowledge about expanding digital technologies in education. Furthermore, by sharing challenges and opportunities in their own digitalisation work, they may create a holistic perspective, understanding what enables and constrains the application of digital technologies in teaching and learning, affecting equality in and between schools.

Conclusions can be drawn that digitalisation work in municipality schools depends a lot on the school organisers and school leaders' leadership and digital competence influencing equality in and between schools and students' possibilities to achieve good results. Teachers and school leaders need digital competence and knowledge of how digital technologies can be applicated to support and facilitate daily work. However, school organisers' digital competence is about understanding how digital systems influence people and why digitalisation in education is important from society's perspective. Even financing is needed for digital technologies to be available and for successful digitalisation work. The findings from this study imply some directions for future research, for example, the importance of school organisers' networks for a shared culture of knowledge and experiences. There is also a need to research school organisers' digital competence, specifically the school managers' digital competence.

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