



In service of school digitalisation in Sweden – a study on ICT coordinators' conditions for work in a local municipal context framed by national educational policy

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Abstract

The aim of this study was to explore, analyse, and critically discuss conditions for Swedish ICT coordinators working on school digitalisation in a local municipal school context. More specifically, the study draws on findings from interviews with 13 Swedish information and communication technology (ICT) coordinators working in eight municipalities that have adopted two contrasting approaches to school digitalisation. One is a general approach with a strong element of individual within-school accountability in the work, and the other a specific approach in which such work is addressed more as an organisational process with involvement of municipal governing officials. Findings show that the two approaches set different conditions in terms of how and with whom the ICT coordinators work and the foci of their efforts although both are framed by the same national educational policy. A conclusion is that the ICT coordinators' role, function, and responsibility should be considered in parity to the level of support, in-school resources, and mandate given to them, not least when organisational instability and reorganisations hamper the work in progress.

Keywords Conditions · ICT coordinator · Policy · School digitalisation

1 Introduction

At the supranational policy level, school digitalisation has gained increased attention for more than two decades (Salajan, 2019). In the Nordic countries, this has been recently reflected in a focus on national educational policy on the importance of providing young people in school with possibilities to develop multidimensional

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digital competence for them to live and work in a future society permeated by highly advanced technology (Arstorp & Røkenes, 2022; Olofsson & Lindberg, 2021; Livingstone et al., 2023; Örtengren, 2023). However, researchers have found that translating national educational policy on school digitalisation into local school practice is challenging. For example, educational policy often seems to emphasise the potential of information and communication technology (ICT) to reform and improve schools, but such expectations in policy seldom seem to be mirrored in actual school practice (Hammond, 2014; Wastiau et al., 2013). However, it has also been noted that ICT coordinators play key roles in overcoming such challenges (e.g., Aslan & Zhu, 2016; Drossel et al., 2017; McDonagh & McGarr, 2015).

In the literature, the typical ICT coordinator is described as a teacher with a specific interest in ICT and school development (Lai & Pratt, 2004; Soza-Diaz et al., 2022). Furthermore, the role, function, and responsibility of ICT coordinators has been developed over time due to various constantly changing needs that follow decisions to use ICT in schools (Milman & Henderson, 2021). According to Woo and Law (2020), an ICT coordinator can work at the regional (municipality) level, supporting school leaders in decision making, strategic planning, and evaluations and observations related to the translation and practical implementation of school policy on ICT. However, they can also work at the local school level on translating national educational policy on issues related to pedagogy and ICT, take responsibility for teachers' professional ICT-related development, and provide in-house technical support (Murphy et al., 2018; Shamir-Inbal & Blau, 2017).

Most research on the ICT coordinator's role in school practices seems to have been conducted in Spain, Israel, Ireland, The Netherlands, the USA, and China (León-Jariego et al., 2020). This is not surprising because Spain and nearly a dozen other European countries (e.g. Ireland, the Netherlands) have national educational policies regarding appointing ICT coordinators at the municipality level and in schools (Eurydice, 2023). In contrast, in Sweden, with its decentralised school system (Hermelin & Trygg, 2022; Lundahl, 2002), school leaders have the responsibility to create conditions for work on school digitalisation (Siljebo, 2022), a responsibility that includes appointing ICT coordinators. For example, a strong local governing association, the Swedish Association of Local Authorities and Regions (SALAR) (2023), states one of the ICT coordinator's responsibilities is running and pushing the digitalisation work forward together with school leaders. According to SALAR (2015), 46% of the school leaders have appointed a staff member with a specific responsibility for the pedagogical use of ICT in their school. This may be considered in the light of a recent evaluation report from the Swedish National Agency for Education (2022), which shows that nearly all compulsory schools have access to one digital device per student (one-to-one computing). This heavy implementation can be traced back to both technical and pedagogical support; however, the ICT coordinator's role in such work is only mentioned once, in a footnote in the report. This allows for local interpretations of the role, function, and responsibility the ICT coordinator is expected to have.

In this paper, we attempt to contribute additional knowledge from the Swedish context with relevance for the international research community. We report on a study that is part of a larger four-year research project, with three already reported

studies, with the overarching objective of determining how recent Swedish national educational policy regarding school digitalisation and digital competence has been formulated and produced (Gustafsson, 2021) as well as translated and operationalised in local school practice (Gustafsson, 2022; Gustafsson & Olofsson, 2023). In this fourth study of the project, we specifically focus on ICT coordinators in Swedish municipalities who have adopted either a *general* or a *specific* approach to local governance of school digitalisation, as Gustafsson (2022) reported. Based on that paper, these two contrasting approaches, further described in Section 4, are central in our study on ICT coordinators.

Against this backdrop, the aim is to explore, analyse, and critically discuss conditions for Swedish ICT coordinators working on school digitalisation in a local municipal school context framed by national educational policy.

Before moving on, we put forth that ‘conditions’ for the ICT coordinators in this paper are understood as manifested at different levels in the Swedish educational system (e.g., national level, local municipality level, and school level) (Olofsson, Fransson, & Lindberg, 2020; Willermark, Olofsson, & Lindberg, 2024) and related to the ICT coordinators’ role and their ability to work with school digitalisation in regard to, for example, individual competencies and room for agency (Soza-Diaz et al., 2022). Given the focus on conditions for ICT coordinators’ work, policy translation becomes an important part of such work in practice along with, for example, maintaining a school’s technical infrastructure or supporting teachers’ professional development in digital competence.

2 Some contextual notes

In the context of this paper, two national policy documents on the Swedish political educational agenda are of particular interest. One is the 2017 National Strategy for the Digitalisation of the Swedish School System (Swedish Ministry of Education, 2017). All Swedish K-12 schools were expected to implement this strategy no later than 2022, but because the target was not met, the Swedish Ministry of Education and Research (2022) suggested a revised strategy for 2023–2027. It should be mentioned, however, that whether or not the revised strategy should be accepted is being debated in both political and scientific arenas. For an international scholarly consideration of this debate, see Selwyn (2023). The other is the National plan of action for the digitalisation of schools, #skolDigiplan (SALAR, 2019), which provides Swedish municipalities with guidelines for their local efforts to achieve the national strategy’s goals, as discussed, for example, by Siljebo (2022).

Together, these documents frame the work on school digitalisation in Sweden, including, for example, guidance on teaching arrangements and learning activities intended to promote the development of students’ digital competence. This is not the least important element in the #skolDigiplan, in which both technical and pedagogical support structures are emphasised. However, the documents do not seem to address potential differences in conditions in local educational contexts in Swedish municipalities that could influence ICT coordinators’ everyday work in school and hence efforts to realize intentions in policy (cf. Gustafsson & Olofsson, 2023).

3 Previous research

International research regarding ICT coordinators spans more than 30 years (McGarr & McDonagh, 2013). Reviews by Woo (2015) and Soza-Diaz et al. (2022) provide a clear overview of research on ICT coordinators between 2002 and 2021. Woo (2015) scrutinised the literature on ICT coordinators' terminology published between 2001 and 2014 and found geographical variations in the terms used for this role. In a European and Australasian research context, 'ICT coordinator' seems to be frequently used whereas in the USA, people in this role are called 'educational technology professionals' or 'educational technologists' (see also Murphy et al., 2018). Moreover, a common motive reported for employing ICT coordinators is to promote effective in-school integration of ICT, achieve policy goals, and contribute to initiatives such as one-to-one computing (Shamir-Inbal & Blau, 2022; Woo, 2023; Murphy et al., 2018; McDonagh & McGarr, 2015).

3.1 ICT coordinators – some notes about role, function, and responsibility

In a recent review of 42 research articles published between 2010 and 2021, Soza-Diaz et al. (2022) define the ICT coordinator's role as one of pedagogical leadership with five descriptive dimensions: acting as a catalyst of ICT integration, an ICT planner, an ICT secretary/accountant, an ICT trainer, and an ICT technician. Similarly, León-Jariego et al. (2020) identify three potential roles for an ICT coordinator in school: supporting use of ICT in the classroom, promoting its use in the classroom, and planning/maintaining ICT used in schools. In a questionnaire-based study of 101 Spanish primary school ICT coordinators, Rodríguez-Miranda et al. (2014) found that a majority of the respondents thought that the most important element of their role was to guide teachers in their use of digital content in teaching and learning.

ICT coordinators' work is also reportedly influenced by relationships among national, regional, and local educational policies and responsibilities. For example, Shamir-Inbal and Blau (2022) stated regional ICT coordinators had a formal responsibility to support local ICT coordinators at several schools in Israel. Similarly, Woo (2015) found that an ICT coordinator may have national, regional, and local responsibilities in public schools in Hong Kong. Moreover, in a Spanish study on ICT coordinators working at the local primary school level, León-Jariego et al. (2020) identified three clusters of role orientations in terms of the context of their work (classroom to whole school) and its complexity (easy to complex tasks). The largest cluster's role was restricted to classroom activities and straightforward tasks (e.g., looking for instructional materials). The second cluster's roles involved both classroom activities and more complex tasks (e.g., ICT management and improvement). The third cluster was responsible for ICT in a whole school, which required the ability to solve complex tasks (e.g., managing and solving more challenging technical problems), in line with McDonagh and McGarr's (2015) descriptions of the ICT coordinator discourse as technologically deterministic considering the potential

of ICT in school. Moreira et al. (2019) also state that ICT coordinators must have complex ICT skills beyond instrumental mastery of technology and the ability to solve technical problems and therefore are in-school agents with responsibility for pedagogically sound use of ICT. These needs were also identified in an online questionnaire-based survey of ICT coordinators from 513 Israeli schools by Blau et al. (2020), together with a need for sufficient organizational knowledge, competence, and a middle management position in a school. Devolder et al. (2010) note another aspect of the role: an in-school budgeter, who would oversee “the expending and administering of an ICT budget” (p. 1653) in the development and optimisation of ICT integration in the school.

3.2 ICT coordinators’ work with educational policy

In an analysis of ICT policy plans of 31 primary schools in the Flandern part of Belgium, Vanderlinde et al. (2012) state that the function of ICT coordinators is to guide school leaders’ promotion of a shared vision of ICT in their schools, including putting policy into practice (see also Avidov-Ungar & Hanin-Itzak, 2019; Avidov-Ungar & Shamir-Inbal, 2017). Similarly, according to Devolder et al. (2010), ICT coordinators play a key role in determining to what degree a school can properly address, translate, and enact intentions expressed in national school policy and steering documents regarding ICT in local-school contexts. In addition, a mixed-method study by Shamir-Inbal and Blau (2022) on the professional development of school ICT coordinators in Israel shows that ICT coordinators should be able to bridge demands of national educational policy and local schools’ specific needs. Furthermore, when the complexity of the ICT coordinator’s role and function increases, local policy can improve their conditions to provide leadership at both the regional and local levels. Research has also shown that it is beneficial for ICT coordinators to establish learning communities in schools and for networks of actors with synergistic competences to collaboratively engage in efforts to translate national educational policy into strategic local ICT plans (Tondeur et al., 2008).

3.3 A brief reflection on the previous research

The above sections concerned empirical studies on the ICT coordinator’s role, function, and responsibility as well as work with educational policy on school digitalisation. Studies were mainly conducted in countries such as Spain (León-Jariego et al., 2020), the Flandern part of Belgium (e.g. Vanderlinde et al., 2011), Ireland (McGarr & McDonagh, 2013), and Israel (Avidov-Ungar & Hanin-Itzak, 2019), where ICT coordinator is an appointed position. Few studies on ICT coordinators and their work seem to exist in the wider Nordic context and in the Swedish context. This is noteworthy because the work on school digitalisation in Sweden has been ongoing for well over 50 years (Rensfeldt & Player-Koro, 2020), parallel with thorough investigations of educational research (Willermark, 2018). However, one exception might be Hansson’s (2013) thesis, in which cultural-historical activity theory is used to analyse school leaders’, teachers’, and ICT coordinators’ collective efforts

to implement ICT in daily school practice. Therefore, it can be noted that in the thesis, empirical findings regarding ICT coordinators were rather limited due to the analytical focus on the collective activity to implement and use ICT. Accordingly, more knowledge is needed on the role, function, and responsibility in countries that have ICT coordinators but not formally appointed positions due to their nationally decentralised school system. In this aspect, the research we report on shall be read as contributing such knowledge from a Swedish context.

4 Method

To explore conditions for Swedish ICT coordinators working in school digitalisation, we conducted a qualitative study, drawing on data from semi-structured interviews with 13 ICT coordinators in eight Swedish municipalities. The first part of this section concerns the selection of municipalities and ICT coordinators working in them, and the second part describes the semi-structured interviews and applied data analysis method.

4.1 Selecting municipalities and ICT coordinators

Acknowledging Hillman et al. (2020) argument about contextual perspectives of local governance being important for understanding work with school digitalisation, we based the selection of Swedish municipalities on Gustafsson's (2022) findings, which conceptualise municipalities as adopting either a *general* or *specific* approach to school digitalisation. In short, in that study, these two contrasting approaches to school digitalisation were realised by analysing empirical data in a comparative cross-case (between-case) study of four Swedish municipalities. Data was collected from transcripts from interviews with school superintendents, local school policies in the municipalities, Education Committee meeting minutes, and additional information collected from school webpages and external revision documents. Data were first analysed as single cases (within-case analysis), followed by cross-case analysis focusing on four contextual factors Ball et al. (2012) and Braun et al. (2011) suggested: (a) material contexts, (b) professional cultures, (c) situated context, and (d) external contexts. The empirical results of the analysis revealed characteristics connected to either a general or specific approach (see Gustafsson, 2022 for further description). Next, we describe the approaches used in the present study.

In the *general* approach, the municipalities engage in local school digitalisation efforts, primarily treating national educational policy translation as an issue for each individual teacher. This approach involves providing generous access in schools to ICT and resources as one way of enabling rich technological environments for the teachers. Municipalities provide a large supportive organisation, and municipal-level agents act as ICT suppliers and providers of supportive infrastructure. However, national educational policy is treated in a general manner without always seeming to cover how digitalisation should be implemented and developed in school practice. In contrast, the *specific* approach involves attempts to establish local coherence and

equity in ICT-related matters. Local educational policy is developed in more detail, and in addition to ICT supplication and support, local agendas and progression schemes specify, for instance, curricular stages that teachers and students should follow. In the specific approach, the work on policy regarding school digitalisation is led at the municipal level by staff in the local education office but often carried out collaboratively with schoolteachers and other official stakeholders within the local-governance setting. Establishment of a local consensus for the work is an important element of this approach, making the responsibility for the work with school digitalisation more closely linked to the local governing level and portraying a holistic view of schooling.

Municipalities representing those that adopt these two approaches were selected in two steps. First, four municipalities were selected because their approaches had been identified in the aforementioned study (Gustafsson, 2022). SALAR categorizes municipalities as rural municipalities, small town municipalities, large town municipalities, and municipalities adjacent to a major city. Second, four additional municipalities were selected that each matched one of the original four in terms of population size and density as well as commuting patterns but differed in the adopted approach to national school digitalisation. Therefore, the aim was to obtain as close a match as possible for municipalities of each category but with a contrasting approach in their policy work. This was done by first colour coding all municipalities on a map containing SALAR's four categories. Municipalities in each category that would enable a geographical spread within the country were identified visually using the resulting map and evaluated for their suitability using official online documents. Finally, four were selected from the set of suitable identified municipalities, which together with the four municipalities Gustafsson (2022) reported resulted in a set of eight municipalities. The municipalities categorized as rural, small town, large town, and adjacent to a major city are designated C8, C6, B3, and A2, respectively (SALAR, 2019) and those adopting general and specific approaches as G and S, respectively. Therefore, for example, GC6 refers to a small town municipality that has adopted a general approach.

The intention with the methodological design described above was to investigate a possible variation in the conditions for the ICT coordinators' work in school digitalisation within each approach. All four types of municipalities were included in both the general and specific approach, using experiences of the ICT coordinators working from 'rural municipalities' to within municipalities 'adjacent to a major city' to explore, analyse, and critically discuss the conditions on an aggregated level, that is, first within and then between the two approaches rather than focusing on the differences within and between each type of municipality.

Acknowledging findings in previous studies that ICT coordinators may work at different levels (e.g., Shamir-Inbal & Blau, 2022; Woo, 2015) and striving to obtain broadly representative data, we tried to recruit one ICT coordinator who worked close to or within school practice and one who had a position close to or within a local education office in each municipality. This included all ICT coordinators working in the four smallest municipalities (in population terms). For the larger municipalities with more than two ICT coordinators, we randomly picked a pair using the staff presentations on the municipal website. As Table 1 shows, in five of the eight

Table 1 Municipality category and participating ICT coordinators

Municipality category	Local governance approach			
	General approach (G)		Specific approach (S)	
	Local Education Office – Municipality Level (M)	School Level (S)	Local Education Office – Municipality Level (M)	School Level (S)
Rural (C8)	← X →		X	X
Small town (C6)	X	X	← X	
Large town (B3)	X	X	← X →	
Major city adjacent (A2)	X	X	X	X

municipalities, two ICT coordinators accepted the invitation to participate in the study – one working at the school level and one working at the municipal office level (SC8, GC6, GB3, GA2, SA2). In the sixth and seventh municipalities, the ICT coordinators who participated in the study worked at both levels (GC8, SB3). In the eighth municipality, the local education office was in the process of hiring a new ICT coordinator at that level, and there was no other contact at the time, so only a school-level ICT-coordinator was included (SC6).

4.2 Semi-structured online interviews

Data were collected from semi-structured online interviews (Bryman, 2016) with the 13 participating ICT coordinators. The interview guide, building on findings reported in previous research on ICT coordinators, covered four themes: (1) the ICT coordinators' background and present position; (2) their work on school digitalisation within the municipality, including experiences concerning organizational and practice-based conditions; (3) conditions for policy work on school digitalisation and digital competence; and (4) reflections on the role of ICT coordinator in the municipality. During September and October 2022, the first author conducted the interviews via Zoom. Following Gray et al. (2020), the main reason for using Zoom was the access it provided to the ICT coordinators located in different and distant geographical sites in Sweden. Moreover, Zoom helped decrease the funding needed for time-consuming travel and provided convenience and flexibility regarding when the interviews could be conducted as well as the opportunity to connect face to face with the ICT coordinators. Potential disadvantages discussed before the interviews concerned technical skills and comfort level using technology when conducting interviews, technical difficulties when conducting online interviews using a program such as Zoom, and problems with uploading interview recordings.

The interviews were digitally recorded and transcribed verbatim into 114 Word A4 pages. The length of each interview ranged from 33 to 65 min, and the total length was 10 h and 44 min. The ICT coordinators consented to participate in the study with agreed adherence to a statement of research ethics following guidelines of the Swedish Research Council (2017), with clauses concerning beneficence, non-maleficance, informed consent, and confidentiality. The study was also conducted

in full accordance with the European Union's General Data Protection Regulation (2016/679).

4.3 Analysis

In addition to descriptions of the methodological design, including choices made in terms of selecting the types of municipalities as well as how data were collected, this study's transparency can also be addressed by describing the analytical process, which was conducted in four steps (Charmaz & Thornberg, 2021; Tuval-Mashiach, 2017) and with the intention to reflect qualities rather than frequencies in the findings (Altheide & Johnson, 2011). First, the interview transcripts were all imported into NVivo 16 software. Second, the interviews were contextually classified as derived from interviews with an ICT coordinator embedded in a municipality taking either a *general* or a *specific* approach to national educational policy on school digitalisation. Next, a thematic analysis (Clarke & Braun, 2017) was conducted based on the aim of this study and the four themes covered in the interviews. The two resulting sets of transcripts were read several times, and both were coded and re-coded (yielding 311 codes in total). Fourth, the codes associated with each approach were aggregated to form categories (24 in total), from which seven sub-themes were generated - four associated with the general approach and three associated with the specific approach. Then, the sub-themes within each approach were read, compared, and reviewed to identify their similarities. This last step ended with naming the sub-themes.

Following Bryman (2016), to reach a high level of intercoder reliability, we collaboratively conducted the analysis to establish a negotiated and joint interpretation of the data collected until consensus was reached. Moreover, to increase the study's trustworthiness, peer debriefings (Spall, 1998) in the form of seminars with other researchers at our university have been arranged to obtain feedback throughout the research process on the sections of the paper, including the analysis and the findings, which we present next.

5 Findings

This section presents the findings, focusing on the conditions for ICT coordinators working in municipalities who take either a general or specific approach to school digitalisation. First, however, we provide a brief description of the 13 ICT coordinators participating in the study.

5.1 The ICT coordinators

None of the 13 ICT coordinators had received formal education for their position, as expected because there is no such specific higher education programme in Sweden. Instead, they were trained teachers who had worked in the regular school system for 9–30 years (in various grades and on various subjects). Some also had

work experience in special-needs education or school-aged educare. Three similarities among the ICT coordinators emerged. The first was a lifelong interest in ICT. Second, most of them said that they ‘had just grown into this position as an ICT coordinator’ (only a few had submitted a formal application for the position). Therefore, becoming an ICT coordinator did not seem to have been part of a career development strategy but rather an opportunity that had come along due to the ongoing Swedish school digitalisation process. Third, they talked about the Swedish national school digitalisation strategy as a motivator, instigator, expander, and intensifier of their work as ICT coordinators.

5.2 The general approach to school digitalisation

We present the findings regarding the conditions for the work by ICT coordinators ($N=7$) in this type of context below and group them according to four identified sub-themes: (1) working on demand, (2) individuality, (3) technology versus pedagogy within a general approach, and (4) municipality priorities and re-organisation.

5.2.1 Working on demand

The ICT coordinators described themselves as guides and inspirational coaches. Based on their continuous identification of needs related to school digitalisation, they recognized the need to be ready to offer support and professional development in ICT to teachers and school leaders as well as guidance to other professionals concerning ICT policy, for example in the local school office. They also said that looking for new ways to optimize the use of ICT in teaching and learning was a continuous task. Supporting and searching for new ICT tools were seen as an important part of the ICT coordinator’s role so they can conduct their work effectively.

I have put a lot of effort in creating examples within a sort of inspirational [social media] site, which I advocate. [...] I don’t do the network thing. I take inspiration from everywhere and try to rethink it to us [the municipality] and our teachers. Then I try to adjust things so that it may [be] receive[d] well. (GC6M)

It was also stated that the ICT coordinators, instead of forcing the teachers to use ICT in the classroom, guided those who came searching for their expertise, emphasising that ‘no one [teacher] is forced to do anything. It is pretty much up to everyone to take advantage of what is offered’ (GA2S). This work on demand also led to the need for ICT coordinators to display their expertise to increase interest in both the ICT tools available and possible ways to use them.

5.2.2 Individuality

When reasoning about school digitalisation and conditions for their work, the ICT coordinators frequently expressed two views. First, they often emphasised that digital competence was a property of a school’s staff – particularly the teachers – more

than an organisational issue. Second, they talked about translating national educational policy on school digitalisation into local policy as a typical in-school activity. When done at a municipal level, there were limited possibilities for individual ICT coordinators to intervene even if they thought progress was too slow or misdirected. Regarding policy translation work, some ICT coordinators indicated that they seldom engaged in such local work and instead emphasised a requirement for personal in-school accountability. They seemed to recognise that national policy per se was sufficient, with no real need to establish a local consensus regarding its interpretation and implementation.

The basics are found in the national policy texts. They are there, and by that, they should be complied to [...] every school can make their own decisions on how to prioritise and set their agendas in how to carry on with digitalisation. Being a larger municipality has its benefits, with many people who can support this work. Do some thinking, find inspirational ideas, and give a hand. (GB3S)

In addition, according to some ICT coordinators, their work was not adequately supported and seldom correctly acknowledged at the local educational governance level. Without a formal education, they often felt they had to rely on their individual, self-developed knowledge and competence when supporting digital competence and the use of ICT for teaching and learning in school digitalisation work. Moreover, they had experienced shortcomings in the responses given to their inspirational presentations and workshops. Among others, teachers and others within the municipality were interested in listening to the ICT coordinators, but implementations within practice were described as challenging.

Oh, but this is delicate. I have thought more than once, wouldn't it just be perfect if I could get to tell them what to do? *laugh* [...] But then, teachers appreciate a certain amount of creative freedom, serving one's own beliefs, and respecting this might be essential to enable the best teaching possible based on the individual capacity. (GC6S)

5.2.3 Digital technology versus pedagogy within a general approach

According to the ICT coordinators, their role in the work with school digitalisation was often dictated by the nature of teachers' or school leaders' requests when contacting them, which often concerned support or maintenance of the classroom technology rather than pedagogically sound uses of ICT. This resulted in a kind of recurrent conflict between a common focus of teachers and other school staff on digital technology per se, and the typical focus of ICT coordinators and others engaged more deeply in implementing the pedagogical uses of ICT. They noted that the emphasis on technology tended to be prioritised. They also stressed the importance of finding a balance between the two foci for their school digitalisation work to be successful, with the teachers and school leaders considering both the technology and its pedagogical uses.

You may have amazing pedagogical motivation and drive but lack technological support, which means you end up doing nothing. Or vice versa, obtaining an infinite number of [technological] gadgets and stuff but lacking motivation and drive. Then nothing will happen either [in the school practice]. (GB3S)

To create a balance between technology and pedagogical use, the ICT coordinator must take responsibility beyond their work description.

In our school, the school leader is great, but unfortunately not interested in ICT. Nevertheless, I manage problems. Just now, they called from maintenance on installing a new interactive whiteboard. [...] This is really not on my plate. But what can I do if nothing gets done otherwise? (GC8MS)

This not only points to how the ICT coordinator takes responsibility; it also points to a somewhat undefined role for ICT coordinators, which is further scrutinised in the next section.

5.2.4 Municipality priorities and re-organisations

Uncertainties in the role of ICT coordinators emerged in their work descriptions concerning municipalities prioritising their tasks. Reportedly, in a state of organisational flux, their position as an ICT coordinator was not always acknowledged by the municipal school organisation, and/or they were experiencing continuous re-organisations that seemed to blur their roles.

Recently, we have experienced changes in our organisation and so on. So, now, there are no such central unit anymore for ICT coordinators. Now, we work within the school leadership units, and right now, there are no designated assignments concerning ICT besides that. (GA2S)

Within an organisational flux, the pressure put on ICT coordinators from local governing officials was criticised by some regarding increased demand for supporting schools in their work with digitalisation. This feeling of a more considerable work burden was among some of the ICT coordinators combined with an opinion about officials being ignorant of why and how ICT should be used in school.

This is a very lonely position, it really is. It gets even worse if there is a lack of interest from local government, particularly in small municipalities such as this. There needs to be efforts from the politicians, the local education office, school leaders and so on. When none of them prioritise this work [with school digitalisation]. This makes things extremely hard for me. (GC8MS)

In the general approach, the ICT coordinators expressed a seemingly unclarified picture of the responsibilities of work with school digitalisation. Suppose it is local politicians and governing officials at higher levels, themselves, the school leaders, the teachers, or a combination of these. This is one aspect connected to the role of the ICT coordinator that differs from the general approach to the specific approach. The approach described in the next section.

5.3 The specific approach to school digitalisation

The work by ICT coordinators ($N=6$) in municipalities that adopted a specific approach to school digitalisation seems to be conditioned by a robust policy agenda characterised by local coherence within schools, equity and detailed local curricular descriptions of progress in digitalised practices for teachers and students. The findings associated with this approach are presented below, grouped according to three sub-themes: (1) Networks and local coherence; (2) Technology versus pedagogy - within a specific approach; and (3) Organisational sustainability.

5.3.1 Networks and local coherence

The ICT coordinators described collaboration with other school-related professionals working at various organisational levels in the municipality as an important condition for their work. They recognised effective collaboration with other professionals as crucial for smooth progress in school digitalisation, particularly for addressing organisational issues in the process and implementing and using ICT tools in schools in practice. This form of collaborative work involved two types of networks: a local policy network and a coordinating network. In the local policy network, the ICT coordinator should contribute to coherence through systematic communication, which is informative and facilitates the creation of a common platform and joint understanding of the process of school digitalisation and how it should be rolled out in the schools. The ICT coordinators said that in addition to themselves, a local policy network could include municipality politicians, local education office staff, school leaders, and teachers.

I try to find a consensus regarding issues that we [in the local policy network] need to work on together. You know, what we should teach, how, why, and what to expect both from our students and from each other within the local school organisation. (SA2M)

The second coordinating network's function was to lead and coordinate the school's digitalisation efforts by connecting key stakeholders, with one ICT coordinator describing the work as being a 'spider in the web' (e.g., spinning network strings). Moreover, ICT coordinators in the specific approach put forth that their role included coordinating network-involved contributions on multiple levels. On a municipality level, they acted as proponents of the school digitalisation work who kept local politicians informed about its goals and progress. They showcased local translations of national policy on school digitalisation and advocated suggested translations in political meetings, e.g., meetings of local education committees. On a school level, the ICT coordinators further developed and implemented the local translations of policy in practice through broad collaborations with school leaders and teachers.

Who are the 'we'? Well, the education office staff, school leaders, of course, ICT coordinators, and teachers. However, I try to collect and organise different

viewpoints expressed [at a school level] and use them to suggest ways to move forward [on a municipality level]. (SA2M)

Moreover, within the coordinating network, the ICT coordinators also described themselves as responsible for organising and supporting adherence to local policy on school digitalisation in their municipalities. They recognised a strong need for coherence and equity in this work, which both politicians and local school officials also valued.

My role is to make sure that it does not matter what school you go to. Decentralisation has been an extremely strong narrative in our municipality, and much has been left to each school to decide. However, the head of administration in our local educational office has invested a lot in unifying the local schools, arguing that we need to progress as one in this for everyone to succeed. (SB3MS)

5.3.2 Digital technology versus pedagogy within a specific approach

In the specific approach, the ICT coordinators noted the importance of their role in discussions of policy and practice conducted within the collaborators of the municipality, considering both technology and pedagogy. They recognised these discussions as crucial to ensuring that both technological and pedagogical perspectives were acknowledged and that this would contribute to the municipality's collective school digitalisation efforts. The discussions were also important to avoid the risks of key requirements for the sound pedagogical use of ICT being neglected on municipality and/or school levels.

There are two persons working with this [technological support]. They are really competent in communicating knowledge of all technical aspects, while I, on the other hand, take care of the pedagogical issues. (SA2M)

Moreover, to counter such risks described above, ICT coordinators reached agreements regarding the delegation of responsibilities for technology-oriented and pedagogically-oriented issues. The ICT coordinators with particular responsibilities for technology-oriented issues were also described as closely collaborating with the municipality's IT office.

We introduced a separate role for pedagogical support when using ICT. If there were only one [staff member] to do everything, it showed to never be any time left for this. So, to make sure of it, we had one of each at every school. [...] Also, our titles were changed so we would not get stuck in our old ways [of organising]. (SB3MS)

5.3.3 Organisational sustainability

Building and supporting networks of professionals involved in school digitalisation as part of a consolidated and sustainable organisation also raised critical

concerns among the ICT coordinators on their own key position. Particular requirements noted included the need for continuous efforts, determination and persistence in policy translational work and following through with organisational changes since time is required for their consolidation.

A sustainable organisation? Definitely not! If I died in a car crash tomorrow, it would be a disaster for many teachers. Poor them! *laugh* But to be serious, it's very much dependent on individuals, and we still need to improve how to take care of our organisation, digital security issues, school development, administration and so on. However, we are on the right track, particularly compared to 2017 when we had nothing [...] I must say I'm extremely proud of our teachers. (SC8M)

When considering sustainability regarding school digitalisation, the ICT coordinators address leadership skills, avoid vagueness, and lead by creating expectations and clear directives. Put differently, that lack of an articulated work description would make their role as ICT coordinators unclear and come with the risk of being blamed if the work with school digitalisation went slow or was unsuccessful.

[With] too much autonomy in the implementation of ICT. If you are uncomfortable in leading, it is easy to push this aside, not prioritise or raise expectations on your teachers. I would have wished for clearer directives from the start. [...] My point being even with a plan, you need someone to implement this rather strict. (SC6S)

6 Discussion

This study was partly prompted by increasing political interest in educational policy in Europe concerning school digitalisation and the development of young people's digital competence (Arstorp & Røkenes, 2022; Olofsson & Lindberg, 2021; Livingstone et al., 2023; Örtengren, 2023). Empirically, it is based on views expressed by 13 Swedish ICT coordinators working with school digitalisation in local municipalities that have adopted either a *general* or *specific* approach (Gustafsson, 2022). In this section, the main findings regarding the conditions for their role and work framed by Swedish national educational policy are discussed, conclusions are presented, and some suggestions for future research and practical implications are provided.

The first observation is the similarity of both the background characteristics and working tasks between the ICT coordinators in this study and the ICT coordinators reported in research from other national contexts (Woo, 2015). For example, they had a teacher background and a personal interest in ICT and school development, which gave important motives and justified their recruitment to this position (see Lai & Pratt, 2004; Rodríguez-Miranda et al., 2014; Soza-Díaz et al., 2022). In addition, like ICT coordinators in other countries (see, for example, Blau et al., 2020; Woo & Law, 2020), the Swedish ICT coordinators engaged in efforts on a regional, municipal, or local school level. Furthermore, conditions for their role and work in

practice seemed to change with the ever-changing needs and challenges that accompanied the ongoing school digitalisation in their municipalities, as noted for example by Aslan and Zhu (2016), Drossel et al. (2017), and Milman and Henderson (2021). In line with previous findings in international research (e.g., Soza-Diaz et al., 2022; McDonagh & McGarr, 2015; Rodríguez-Miranda et al., 2014; Moreira et al., 2019), the ICT coordinators described their role as being complex and multifaceted, as a palette of tasks involving work related to technology, pedagogy and their combination in teaching and learning. Moreover, they contributed to teachers' professional ICT-related development in schools (see Shamir-Inbal & Blau, 2022). The ICT coordinators also engaged (in collaboration with agents acting at various organisational levels in the municipalities) in translating national school digitalisation policy into local school contexts (see Avidov-Ungar & Shamir-Inbal, 2017; Devolder et al., 2010). An observation here is the several voices about the relevance of the 2017 National strategy for the digitalisation of the Swedish school system (Government decision I:1, supplement, 2017) and #skolDigiplan (SALAR, 2019), two Swedish national educational policy documents talked about as influencing the local governance on school digitalisation and therefore also the role and the work by the ICT coordinators (cf. Shamir-Inbal & Blau, 2022).

6.1 The role of ICT coordinators in a Swedish municipality taking a general approach

Our findings show that the ICT coordinators in a Swedish municipality taking a general approach to school digitalisation may have a role being torn between supporting the technology infrastructure in a whole school or pedagogically supporting teachers in using ICT in a sound pedagogical manner together with the students in the classroom (cf. Soza-Diaz et al., 2022). The role is described as featured by on-demand tasks initiated by the teachers or school leaders, and digital competence does not seem to be developed as an organisational issue. The work by the ICT coordinators may, therefore, be characterised as meeting teachers' and school leaders' instant needs and simultaneously, by the opportunity this entails, showcase various digitalised teaching and learning practices that could be important elements of the digitalisation process. The ICT coordinator's role seems to be to develop individual school leaders, and teachers' digital competence and knowledge about arranging pedagogically informed and ICT-infused classroom practices (cf. Moreira et al., 2019). The dilemma, however, addressed by the ICT coordinators is the responsibility to develop all teachers' digital competence, even those who do not actively seek their support. Due to the role of the ICT coordinators within the general approach, teachers who do not take the initiative by themselves or avoid engaging may be left out of the work on school digitalisation.

The local translations of national educational policy on school digitalisation seemed to be considered as something to be handed over to the teachers. Some said that school digitalisation should not be governed by national directives but should be in the hands of professional teachers. The ICT coordinators in this approach expressed feelings of being rather detached from the work of local officials, such

as local politicians and staff in the local education office. This detachment to higher organisational levels seemed to be associated with risks some of the ICT coordinators recognised. Such risks are given (partial) responsibility for lack of sufficient translational work and possible blame for any failure to implement local policy (cf. Shamir-Inbal & Blau, 2022).

Overall, and for some reason, the role of the ICT coordinator in municipalities adopting a general approach is oriented towards being a rather isolated and vulnerable position. This includes feelings expressed as being left alone, with expectations to provide in-school support on-demand and (often) to be the key player in translating national educational policy into practice. Additionally, they rarely felt acknowledged in their work by local governing officials and often were neglected in a continuous process of school reorganisation. However, as the findings show, despite possessing self-developed knowledge and competence, as well as ambitions to inspire teachers and help them to optimise the use of ICT in teaching and learning, there seem to be substantial constraints as they lack sufficient authority and/or support for the required decision-making.

6.2 The role of ICT coordinators in a Swedish municipality taking a specific approach

Moving on to the findings regarding the ICT coordinators working in municipalities taking a specific approach to school digitalisation, a first observation is that their role and work seem oriented towards collaboration. With robust reported support from governing officials, these coordinators emphasised the importance of their local role in building collaborative networks (cf. Tondeur et al., 2008). Together with other professionals working at a municipal and/or school level, they translated national educational policy on school digitalisation to fit the local context. The way of organising, sharing a common platform within the school organisation, and involving professionals from teachers to local politicians seemed to create safe and supportive working conditions for the ICT coordinators. Their role in coordinating these networks was also beneficial in facilitating the establishment of coherence, equity, and joint understandings in school digitalisation, which in turn created a locally stable translational work (Blau et al., 2020).

ICT coordinators in the specific approach described their role as demanding due to expanding responsibilities to address issues such as cybersecurity and artificial intelligence (AI)s. From the outside, however, the organisation could be argued to be signalling stability, sustainability, and balance. This could make expectations on the ICT coordinators hard to fulfil given that organisational changes such as building networks take time and effort. If the organisational routines created within the municipalities in a specific approach were consolidated, the ICT coordinators argued that the municipalities would need to follow through on school digitalisation with determination and continuous translational work. This was also considered necessary for national educational policy to be realised in the everyday life of schools (cf. Devolder et al., 2010).

Another interesting finding is that the organisational structure in municipalities adopting a specific approach, either deliberately or unconsciously, seemed to favour more specialised and formalised functions as well as the division of responsibilities among ICT coordinators, with some focusing mainly on whole school technology support and maintenance. Others mainly help teachers to use ICT in a pedagogically sound manner in the classroom (cf. Rodríguez-Miranda et al., 2014). Moreover, this seemed to promote a high degree of technology functionality, which enabled the creation of pedagogically driven ICT practices that acted out thoughtfully and collaboratively. By not being torn between these two tasks, the ICT coordinators were said to be able to make better use of their competence and further the role of improving the quality usage of ICT within the school organisation. The organisational arrangements surrounding the ICT coordinators within this approach, their role, function, and responsibility imply that their position may become more cemented into the municipal structure, solidified within local governance, and therefore become more persistent to future changes.

The main findings regarding the ICT coordinators working in municipalities that adopted a specific approach present a picture of an organisationally knowledgeable person with the competence to create collaborative arenas for important municipal stakeholders for school digitalisation work. Hence, this role can be described as ‘spiders in the web’ promoting school digitalisation in meetings with local politicians and discussing with school leaders and teachers how to translate national educational policy and coordinate the local work to improve the ICT-infused teaching and learning practices. Signs found point towards a more pragmatic way of working where the ICT coordinator has the possibility to play a key role, which requires organisational stability, persistence, and controlled progress. An awareness that networks and local policy routines should be consolidated and detached from specific persons to make the progress sustainable within a municipal framework is also of importance.

6.3 Concluding remarks

The preceding discussion suggests that a municipality’s approach to school digitalisation work and policy translation strongly influences the work of the 13 Swedish ICT coordinators who participated in this study. For example, the work of ICT coordinators in a municipality adopting a general approach is often focused on individual teachers. This includes inspirational support and often support with technology functionality, but limited ability to influence a pedagogical sound use of technology in the classroom. These ICT coordinators describe a role orientated towards isolation, limited recognition from governing officials, and a constant risk of being a target for politicians’ or local education officials’ dissatisfaction with progress in translating national educational policy into local school digitalisation.

In contrast, the ICT coordinators in specific approach settings, where the work on school digitalisation and policy translation is conducted more holistically, are regarded within their role as part of the local work as a whole. This means that they collaborate with teachers and others within the municipal school organisation to use

ICT in the classroom in a pedagogically sound manner. This way, the outcome of policy translations and in-school digitalisation efforts is a responsibility shared with others through collaborations, networks, and the establishment of foundations for municipal coherence. Despite this shared responsibility, the ICT coordinator in the specific approach described their role as demanding due to the role of a stabiliser in an ongoing process of building a sustainable organisational structure.

In sum, the main knowledge contribution in this rare study in a Swedish research context (e.g., Hansson, 2013) is that the conditions for ICT coordinators working with school digitalisation and policy translation vary in several ways in the eight focal Swedish municipalities, depending on whether the municipality adopts a general or specific approach. In short, context matters, and it is important that Swedish municipalities make genuine efforts to allow the role to be acknowledged, integrated, and established into the school system. Moreover, the role of the Swedish ICT coordinators can be understood as mid-level translators of national education policy with strong agency related to school digitalisation processes. A third knowledge contribution is that the role of the ICT coordinators in both approaches seems to be orientated in several different and sometimes fragmented ways regarding agency, responsibility, and influence over local school digitalisation efforts framed by national education policy on school digitalisation.

6.4 Further research and practical implications

The findings of this study suggest that ICT coordinators' work may be increasingly important in Sweden and other countries. Further research may, therefore, address, for example, possible strategic support (on both organisational and individual levels) for the role and its orientation in Swedish schools in terms of profession-specific formal and informal training and ICT coordinators' views on their role as mid-level translators of school digitalisation policy. Their collaboration with local governing, politicians, and school officials, as well as the processes involved in building networks for the initiation, establishment, and development of school digitalisation, also warrant attention in further research. The research should preferably be conducted at both a national level and a local municipal level, together with comparative international analyses.

Our study recognises the ICT coordinators and their role as key persons in the work with school digitalisation in Swedish municipalities. However, the findings per se do not describe the outcome of the local work on school digitalisation. A practical implication of the study concerns the question of equality. That is, for Swedish schools all over the country to be successful in their work with school digitalisation, there is a need for joint responsibility and joint efforts by politicians, representatives in the local school offices staff, and staff in the schools (ICT coordinators, school leaders and teachers). Another practical implication is that despite the approach taken in a municipality, the role and orientation, function, and responsibility of ICT coordinators should always be considered in parity to the level of support, in-school resources and mandate given to them not the least when organisational instability and reorganisations might hamper the work in progress.

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Data availability The datasets generated and/or analysed in the presented study are not publicly available, due for example to privacy-linked restrictions, but may be available from the corresponding author on reasonable request.

Declarations

Conflict of interest The authors confirm no conflict of interest in the reported research.

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