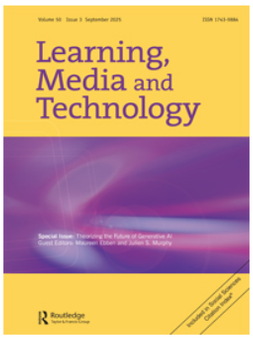

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'We have- we had a digital debt': a case of digitalized school leadership practice

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ABSTRACT

The article adopts a critical approach regarding the political ambition of educational technologies (edtech) in schools. The focus of the article is to understand how school digitalization policy works on people in schools through meaning-making objects for thinking and acting towards digitalization in schools. A case of Swedish principals working with digitalization in schools was investigated in their municipal context of school development, where they were guided by a policy instrument of the Swedish National Agency for Education. Policy documents, from the agency's instrument, transcribed interviews with principals, and principals 'development plans' (local policy), were analyzed with a focus on what objects seem to guide the thinking and actions of the principals. Specifically, the focus of the analysis regards what meaning digitalization school policy may be conveying to principals in schools, what meanings they attribute to edtech, and how they orient their and teachers' work towards objects of digitalization in schools.

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Introduction

Education policy analyses show that digital educational technologies (edtech) in Swedish schools correspond with an historical development where the political ambition to have edtech in formal education settings has continually led to the technologies being there (Karlsohn 2009). In a recent Swedish study, for example, Gu and Lindberg (2021) found that 'digital education' (i.e., education with digital technologies included) has been maintained despite education governance reforms between 1960 and the 2020s (see also Rahm 2023). Moreover, Rahm (2019) put forth that various socio-technical imaginaries of computers (e.g., threat vs. opportunity) have historically shaped Swedish adult education policies and practices accordingly between 1950 and 2010. And Rensfeldt and Player-Koro (2020) suggested that socio-technical imaginaries of 'digitalization' and its inclusion in Swedish school curricula have been a primary political instrument between 1969 and 2019. In other words, it would seem that Swedish education governing and edtech go hand in hand, regardless of education level, of imaginaries regarding if digital technology is 'good' or 'bad', or of a broad restructuring of education governance.

On the one hand, such historical analyses also depart from a point that that there has always been and still is an unrealized hype regarding the positive effects of edtech in Swedish education (Gu and Lindberg 2021; Jedeskog 2005; Karlsohn 2009; Rahm 2019; Rensfeldt and Player-Koro 2020). Yet such hype includes far more nations than Sweden (Eickelmann 2018; Ottestad and

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Gudmundsdottir 2018) and is represented by education agencies with a larger reach than national agencies, such as the European Commission and the OECD (e.g., European Commission 2017; van der Vlies 2020). On the other hand, this hype may be problematic for people responsible in schools where the effects of edtech are meant to appear, yet seem to do so with ambiguous results (Cuban 2001; Säljö 2010; Selwyn 2022). However, it is in schools and 'through' people therein that the ambitions in school digitalization policy regarding edtech must operate, which entails political ambition meeting with the 'every day' of schooling (cf. Ball, Maguire, and Braun 2012; Selwyn et al. 2018). As such, it may be assumed that policy works in different ways through people in schools.

There are, however, cautionary signs that are cause for skepticism that today's hype, high expectations, possibilities ripe for 'harnessing', etc., in school digitalization policy regarding edtech may be connected to and work as instruments of broader ideological views regarding education and society in general (e.g., Ball and Grimaldi 2022; Selwyn 2013; Williamson et al. 2019). For example, Selwyn suggested that by promoting 'the virtue' of edtech in education, by actors giving various positive meanings to edtech, contemporary Western ideologies, such as neo-liberalism, may be maintained and work through edtech (Selwyn 2013). Given contemporary European governing, finding neo-liberal ideology in Swedish school digitalization policy would perhaps not be a particularly novel finding (cf. Sundberg 2021). Yet we know relatively little regarding the relation between school digitalization policy regarding edtech and if and how people in schools may become actors of such policy. The general contribution of this article is aimed towards a critical approach to this issue.

The above history and contemporary practice of *policy-driven* digitalization in schools is called digitalized school practice in the following text. A recent development in Swedish digitalized school practice is the focus on school leadership and primarily that the people working with the formal role of school principal are held as key to digitalized schools (cf. Swedish Ministry of Education 2017; Swedish National Agency for Education 2022b). Regarding principals as potential 'policy actors' in Swedish digitalized school practice and internationally, we know relatively little (cf. Krein 2023; Siljebo 2023). This may be because the focus of education research seems to have been on the various practical issues that principals are perceived to have when digital technologies are implemented and used in schools (e.g., Dexter 2018; Håkansson Lindqvist and Pettersson 2019; Islam and Grönlund 2016) and their innovative use for school development (e.g., Agélii Genlott, Grönlund, and Viberg 2019; Håkansson Lindqvist 2019; Willermark and Islind 2022). This may be understood within the Swedish context where principals are held to legal account, according to school legislation, for 'school development' in terms of systematic quality work (Lundström 2015), and where school development and school digitalization seem to be intertwined in school policy (Swedish Ministry of Education 2017; Swedish Ministry of Enterprise and Innovation 2017). The focus in research on innovative practices and possible hindrances to principals' work with digital technologies is reflected also, for example, in education research in other Nordic countries (Hauge 2016; Ilomäki and Lakkala 2018; Ottestad 2013) and generally reflected in international school leadership research (Daniëls, Hondeghem, and Dochy 2019; Dexter 2018; Pettersson 2018). There are a few exceptions from the focus on innovating schools, where instead focus is on the relation between digital education governance (cf. Williamson 2016) through data and school leaders in national cases (e.g., Martinez Lunde 2022; Selwyn 2016; Starkey and Eppel 2019). The purpose of this article is to understand how digitalized school practice, as a policy-driven process, may work in relation to principals, specifically through understanding the meaning that is given edtech in schools.

A central agency for both principals and digitalized school practice in Sweden today is the Swedish National Agency for Education. The agency was in 2020 given the 'sectoral responsibility' for digitalized school practice by the Ministry of Education (SFS 2015:1047, §18), and the agency is responsible for the three-year national principal education program (SFS 2011:183, §8) given by universities, where the agency sets the education's goals. Moreover, the agency was recently tasked by the Swedish government to produce the most recent large-scale policy 'national digitalization strategy for schools' spanning the years 2023–2027 (Swedish National Agency for Education 2022) and the agency also creates national curricula. Finally, and specifically focused on in this

article, the agency makes available 'competence development modules' for school leaders and teachers on its website, for example, regarding digitalization in schools. These modules can be understood as policy instruments (cf. Lascoumes and Le Galès 2007) that bring external ideas into schools by steering people in schools towards increased self-governing (e.g., Kirsten 2020).

The study reported on in this article sought to answer the purpose by analyzing three empirical sources: (a) six policy documents from the National Agency for Education's online module (policy instrument) called Leading Digitalization, (b) interviews with thirteen principals in one municipality that worked with the module with their teachers, and (c) eight (local policy) 'development plans' that some of the principals created together with teachers, following the form proposed in the agency's module.

Analytical framing

The purpose of this article is to understand how digitalized school practice may work in relation to principals, and this purpose assumes a theoretical relation between policy and what principals do in school practice. Specifically, digitalized school practice influences the thinking and action of principals in schools by giving meaning to edtech in schools and that people in schools must make their meaning of edtech appropriate for their context. This two-way relation of meaning is here conceptualized with the concept of meaning of making *object*. In other words, it is here assumed that thinking and acting in school leadership activities is object-oriented: people's work in school is oriented towards objects that carry meaning for them and that can convey meaning to others. This is a theoretical position substantially developed in cultural-historical activity theory (Engeström 2015; Leontiev 1978; Roth and Lee 2007).

In activity theory, objects are described to (a) give meaning to an organization of practice (i.e., an activity system such as a school) and (b) be the foundation for understanding peoples' thinking and actions in this practice. Leontiev, a substantial contributor to modern activity theory, described the two-sidedness of an object as

> The basic, constituent feature of activity is that it has an object. In fact, the very concept of activity (doing, *Tätigkeit*) implies the concept of the object of activity. The expression 'objectless activity' has no meaning at all. Activity may appear to be objectless, but the scientific investigation of activity necessarily demands the discovery of its object. Moreover, the object of activity appears in two forms: first, in its independent existence, commanding the activity of the subject, and second, as the mental image of the object, as the product of the subject's 'detection' of its properties, which is effected by the activity of the subject and cannot be effected otherwise. (Leontiev 1977, 162, emphasis in original)

In relation to digitalization in schools, one can thus understand the first form of an object – the 'independent existence' – as a *proposed* why and how (e.g., policy) of edtech in schools (an external, communal, and shared object). The second form – the 'mental image' subject to detection – is an *individual's* motive (internal, personal object) mediated in thinking and action by a person in their situated activities. As such, there are, on the one hand, both motives of individuals and, on the other, objects that orient and organize the joint activity of many individuals in communities. Put differently, there is a dialectical relation in meaning-making objects: a movement between individual and society, a 'fusing together' of motive/object (Roth 2014).

In summary, this theoretical position entails that meaning – in terms of objects – that is given edtech in schools is shared, for example, between the activity systems of a community of schools and between digitalized school practice and schools (cf. Engeström 2015). Meaning is also individual – motives of acting towards/in response to objects – where, for example, the context of individual, personal ambitions, etc., is more or less 'aligned' to shared meanings (cf. Leontiev 1978). At the center of the coming analysis, to answer to the purpose is thus motives/objects (Roth 2014) – meaning – accorded to edtech. There are, however, relatively fixed 'meta-level' meanings given to edtech, generally shared in many Western societies today, which will be called *edtech objects*.

Edtech objects

To give an analytical background to edtech objects, in this article, such objects are understood with inspiration from what Selwyn describes as beliefs, values, interests, agendas, etc., in relation to edtech as a positive project (Selwyn 2013). The purpose of bringing this background into the analysis is to give a common frame of reference across the three different empirical sources for understanding possible meta-level meanings of edtech objects, perhaps shared not only nationally in Sweden abut also locally in the study's context.

According to Selwyn (2013), edtech, as a positive project, contains various approaches by stakeholder groups that, taken together, adopts a consensus – willingly or not – that edtech can change, transform, develop, improve, etc., education and schooling for the better. Paradoxically, as Selwyn argues, this can be achieved even though each approach has its definitions of the positive effects of edtech in education and that these can be at odds with other approaches.

Selwyn proposes five positive edtech objects that are traditionally associated with approaches in education to edtech (see Table 1); objects in terms of why and what edtech ought to be in, for example, schools.

In short, Selwyn argues that the proposed effect of these edtech objects is that they, in the end, promote edtech in education as positive (Selwyn 2013).

For this article, the edtech object backgrounding contributes to understanding of the 'educational' in edtech. One, it suggests that digital technologies are given educational meaning when described as edtech. Two, there is considerable research evidence that edtech is connected to meta-level meanings, such as political hype (e.g., Cuban 2001; Karlsohn 2009), economic market actors and marketization (e.g., Grimaldi and Ball 2019), ideology concerning society (e.g., Selwyn 2013), and not seldom an 'amalgamation' of these and more (e.g., Williamson et al. 2019).

Methodology

A majority of schools in Sweden are organized (e.g., staff employment, funding based on local population, responsibility in relation to school law and national curricula) by local municipalities. Based on previous knowledge of the author, principals were contacted in a relatively small municipal schooling context where the municipal school administrative board during 2020–2021 made all principals work with the Swedish National Agency for Education's Leading Digitalization module. This was anticipated by the board to lead to school development regarding digitalization. The empirical study can thus be framed in terms of a case consisting of a group of principals, and the analysis focuses on objects related to their relatively explicit work with digitalized school practice.

Table 1. Approaches and objects of the positive project of edtech in education, adopted from Selwyn (2013, 31–38).

Approach	Edtech object
Learner-centered learning	The enablement of learners through accessing sources of knowledge outside the immediate 'learning environment', e.g., CSCL. Learners gain autonomy and power, e.g., beyond the 'formal' (classroom).
Efficiency	Efficient logistics (organization) of educational provision via edtech. A more economically sound, 'profitable' schooling via edtech. A more economically competitive labor force and knowledge production via national edtech schooling.
Communitarianism	Edtech is enabling counter-cultural reimagining and reorganizing of formal (traditional) schooling towards a communal utopia.
Anti-institutionalism	Edtech is enabling 'bottom-up', self-determining redistribution of power, setting individuals free from institutionalized and inhibiting forms of learning
Techno-fundamentalism	Edtech is a fundamental part of all aspects of life and more so in future life. Edtech is fundamentally improving current and future aspects of life.

Empirical sources

The empirical sources of the study consist of three different materials: Leading Digitalization documents ($N = 6$), interviews with principals ($N = 13$) and local development plans ($N = 8$). The approach to gathering these three materials was to enable a thick description (Geertz 2008) of the case which could answer to the purpose. Notably, thick descriptions are still interpretations. The three sources are described in more detail below.

Leading digitalization

The Leading Digitalization module focuses on school leaders' practice with digitalization. The module is 'taken' via the agency's webpage and is divided into six parts with six documents, each part following a similar pedagogic framing. First, a principal is supposed to compose a group consisting of 3–6 teachers and themselves. This group ideally start in part one of the modules by reading the document (in some parts there are also videos) and after this discusses the content according to several questions. This framing is repeated in the following parts. The goal after following the parts of Leading Digitalization is to produce a school-local *development plan*. The six documents were downloaded in August 2021 from the agency's webpage (Swedish National Agency for Education 2023) where they were publicly available. The documents are argumentative texts by different authors that give various meanings to why and how digital technologies ought to be in schools.

Interviews with head principals

All head principals in the municipality ($N = 16$) were contacted by telephone and asked if they wanted to participate. The reasoning regarding this sample was primarily purposive (Simons 2009) to cover a reasonable number of principals that took part in Leading Digitalization. Eventually, thirteen accepted the interview invitations and took part in the study in August 2021: three kindergarten principals, seven compulsory school principals, and two upper secondary school principals. The three head principals who chose not to participate were all kindergarten principals.

The interviews followed a semi-structured approach (Kvale and Brinkmann 2009) and the parts of the interviews that were specifically relevant to the article answered regarding questions on the themes (a) what the principals believed to be the reason for working with the Leading Digitalization module in their municipality, and (b) from their own experience as principals what 'digitalization in schools' is and how they can perceive it. The interviews lasted between 44 and 72 minutes and were transcribed verbatim.

Local development plans

During the interviews, some principals mentioned that they had development plans or were in the final stages of completing them as part of Leading Digitalization. When asked if the plans could be included in the study, plans from eight of the principals/schools were received during the autumn of 2021. The development plans vary considerably in terms of their document length (1–10 pages) and content (text, tables and figures). Many of them follow the model proposed in Leading Digitalization: specifying long-term effects that one would like digital technologies to lead to in schools, and breaking these effects down into smaller work tasks, resources (edtech), people, etc., closer in time.

Analysis

In the following analysis, an object is operationalized in three different meanings: *individual object* containing interpretations of motives for each empirical material, *shared object*, containing interpretations of 'what' the individual objects may be more or less aligned to, and *edtech object* where the empirical materials are interpreted and compared according to Table 1.

Object analysis

This section is composed of three parts according to each empirical source and respective material. At the end of each part is a table summarizing objects and these objects are referenced in the text within parentheses, for example (O1) for the first object in all data sources. As such, the document analysis contains 12 objects (Table 2), the interview analysis contains 9 objects (Tables 3 and 4), and the development plan analysis contains 11 objects (Table 5).

Leading digitalization

In the first document, there are two individual objects. The first can be found in the first section, where the document's author suggests that digitalization ought to be as unquestionable as electrification is today (2). In other words, digitalization is an object (O1) beyond questioning. The second object can be found in the remaining text, where the author suggests that digitalization often is 'discussed' too generally. There is also a suggestion on how to address this object by constructing three main areas that are 'good' reasons and areas that without any doubt are constructed as proof of digitalization: organizational aspects of digital administration/management (3), digital technologies in classrooms (e.g., computers and digital textbooks; 3–5), and that students are living/will live 'digital

Table 2. Individual objects are analyzed in Leading Digitalization documents.

Individual objects	Edtech object
1. Digitalization is beyond questioning; as unquestionable as electrification (1). 2. Digitalization has or will transform the management/administration of organizations, teaching/learning and/or students 'digital lives' (3–8).	Techno-fundamentalism. Efficiency
3. When there are many digital technologies in classrooms innovations/effectivizations of teaching/learning ought to happen if managed right (3–6). 4. Diffusing (spreading) innovation/effectivity in all classrooms/schools is key to managing digitalization right (8–10).	Efficiency. Techno-fundamentalism
5. By including digitalization in the law-bound activity systematic quality work that principals are responsible for, school development takes place (1). 6. Since development ought to systematically take place all the time, one can never be content with digitalization; more development equals more digitalization (1).	Techno-fundamentalism
7. Higher learning outcomes will come when digital technologies are in classrooms and every teacher uses the same, revolutionary (non-institutional) pedagogic model (5–9). 8. A 'sharing culture' (i.e., where teachers share their, and use others', digital learning resources in a digital platform) is necessary for digitalization (9).	Techno-fundamentalism. Communitarianism. Anti-institutionalism
9. Digitalization in schools equals a digital ecosystem, where the smooth (efficient) flow of information is key (2). 10. The ecosystem has environmental boundaries (physical milieus, edtech/infrastructure suppliers, authorities and primary caregivers, *p*. 3, 8) that cannot be crossed.	Techno-fundamentalism. Efficiency. Communitarianism
11. Producing and analyzing data corresponds with school development (1). 12. Development corresponds with setting goals and constructing measurements (1).	Efficiency. Techno-fundamentalism

Table 3. Individual objects relating to why there was a need for Leading Digitalization.

Individual object	Edtech object
13. The same access to (a) technologies between schools, and to (b) competence/leadership between schools ensures 'equality' (i.e., no school being better/worse than the next).	Techno-fundamentalism
14. Digital technologies in schools can be implemented in accordance with national/municipal governing documents.	
15. Municipal-wide, bottom-up digitalization is required.	~Anti-institutionalism/communitarianism

lives' (5–8). The object (O2) is thus constituted as the transformation of any of these parts individually or their interaction.

In the second document, there are two individual objects. The first object builds on the assumption that a school or municipality administrative board has 'implemented' computers in schools, even so, there are no 'second-order changes' (1; referring to Cuban 2001) which entails a conflict when computers are used to conduct 'business as usual' instead of the object (O3) 'innovative' work/learning in schools. The second object of this document builds on the assumption that there are both positive and negative effects of digitalization (3–6) and that the deciding factor is leadership, specifically, that the 'mission of leadership' is the object (O4) of taking innovations/effectivity from individual classrooms/schools and applying them in all classrooms/schools (8–10).

In the third document, there are two individual objects. The first builds on the assumption that systematic quality work, a law-bound responsibility of Swedish principals, is a foundation for organizational development, and that digitalization equals organizational development (1). This object (O5) entails including digitalization in systematic quality work which would entail that school development will happen. The second object builds on the assumption that people must concretely specify where they want to be (e.g., in a vision or plan) based on where they are right now (1); or contrariwise, specify what they do not have right now (e.g., computers) and think is required to achieve what effects they can imagine. This is also the basic assumption of the 'Chain of effects' model presented on the remaining pages, and the model that the development plans are meant to follow. The object (O6) as such, entails not being content with the current situation of digitalization; always chasing change.

In the fourth document, there are two individual objects. The first builds on the assumption that digitalization equals a revolutionary change in teaching and learning practice (3), away from traditional teaching and learning practice. Several arguments are given regarding digital technologies' affordances for revolution, and the main example of revolutionary change in teaching and learning practice centers on a method of formative peer assessment in digital settings in lower compulsory schools (5–9). The object (O7), as such, entails achieving higher learning outcomes through computers in classrooms and systematic, large-scale (i.e., many schools) untraditional (e.g., innovative) methods. The second object builds on the assumptions of the first, however, that an object is also changing the culture that teachers enact. Specifically, a so-called (O8) sharing culture, where

Table 4. Individual objects regarding what 'digitalization in school' is.

Individual object	Edtech object
16. A productive tool for work: documentation, planning, teaching, structuring, and communication made easy.	Techno-fundamentalism
17. School and home: School-based activity with technologies (learning) is necessary considering home-based use (play).	Techno-fundamentalism
18. Learning and teaching: learning must be modern/contemporary via digital technologies, and they are supportive of many aspects of teaching	Techno-fundamentalism
19. National curricula: digital technologies in teaching are evidence that curricula are followed.	
20. Future society and school: the future is digitalized, and children must be educated via digital technologies for this reason.	Techno-fundamentalism
21. Access and functionality: access to, and proper function of, digital technologies equal digitalization.	Techno-fundamentalism

Table 5. Shared objects in development plans as stated long-term 'effects'.

Shared object	Plan number	Edtech object
22. Different digital technologies are used daily by all teachers; digital ways of working are natural	1, 3, 6, 7, 8	Techno-fundamentalism
23. Children become active producers of digital technologies and want to share their products.	1	Learner-centered learning
24. The digital strategists feel like a natural support that is used when needed.	1	
25. The sharing and own use of 'good examples' of digital teaching is a natural part of work; 'sharing culture'; and collegial development.	1, 2, 3, 4, 7	Communitarianism
26. Digital technologies can mean individualized teaching.	2, 8	Learner-centered learning
27. The technologies can lead to increased learning outcomes; pupils' knowledge development	2, 3, 4, 8	Learner-centered learning
28. 'Frequency of use' of digital technologies has increased and they are used 'complementary' in teaching.	3	Techno-fundamentalism
29. The 'red thread' is clearer for pupils and education will 'flow' between grades without 'bumps' when appropriate use is achieved.	4	Techno-fundamentalism
30. Use digital technologies for creative and entrepreneurial learning: a modern/future school.	5	Techno-fundamentalism
31. Digital technologies in teaching will create the future coworker.	5	Techno-fundamentalism
32. Awareness that governing documents say that digital technologies must be used is increased	6	
33. Digital technologies will lead to 'The good user' who does not make mistakes, has good ways of working and approach, and communicates well with primary caregivers.	6	Techno-fundamentalism
34. The technologies lead to improved education and effectivizations in organizing via a 'good learning environment 1:1' and digitalization in teaching.	7	Efficiency
35. Digitalization has made teachers' work situations easier regarding teaching, communication and administration.	7	Efficiency
36. Students' 'motivation and engagement' is increased [by the use of technologies]	8	Techno-fundamentalism
37. Students' 'source criticism' ability is developed [by the use of technologies].	8	Techno-fundamentalism

teachers ought to share their knowledge in organized forms (e.g., sharing documents in a digital platform).

In the fifth document, there are two individual objects. Both build on the assumption that thinking about digitalization in schools as a digital ecosystem is the correct unit for analyzing developments/problems, where each part of the ecosystem (i.e., digital infrastructure, digital equipment, digital resources and users) is equally important (2). The first object concerns the 'lifeblood' of the proposed system, which is (O9) digital information (i.e., all manners of user/machine-generated digital data in schools), and the smoothness of its flow which determines the ecosystem's productivity. How smooth the flow depends on the flow of information between one and/or many of the system's parts. The second object concerns the construction of 'the environment' of a digital school ecosystem (i.e., physical milieus, edtech suppliers, authorities, primary caregivers; 3, 8). In other words, there is a 'natural order' that digital ecosystems must abide by the (O10) boundary of 'us' that maintains the system, and 'them' that determines conditions.

In the sixth and final document, there are two individual objects. Both assume that data are the key to development work (1). Without gathering data and, more importantly, imagining a relationship between data (e.g., how many teachers share their own learning resources with other teachers in digital platforms) and development goals (i.e., achieving a 'sharing culture' between teachers; 3) it is impossible to know if development is taking place. The first object (O11) is to believe in the developmental potential of data in all its forms. The second object (O12) constitutes the imagining of a development goal and constructing the corresponding data.

As illustrated in Table 2, many of the objects in Leading Digitalization seem closely aligned to a few edtech objects. Mainly there seems to be an emphasis on techno-fundamentalism, a

straightforward faith in the transformative power of edtech in schools: as long as edtech is in schools, things will (have to) positively change. Also prominent is efficiency in terms of 'innovation' and effectiveness (i.e., learning can be increased efficiently through doing the same thing in every school). Interesting 'outliers' in some regards are the anti-institutionalism (revolution from tradition) and communitarianism (counter-cultural) arguments in document 4, and communitarianism (ecosystem utopia with them-and-us-boundaries) in document 5. These are, however, framed within techno-fundamentalism.

Interviews – why leading digitalization?

To start with, there was a shared historical object within the municipality that was described in terms of *being behind/in debt/slow* as the reason for Leading Digitalization. In other words, all principals taking Leading Digitalization seemed to be built upon some experienced failure of not doing or being somewhere that could be. The shared 'debt object' was described by one principal as

> We have- we had a digital debt … Before, the digital learning resources or hardware that we were given were more or less … gadgets. But now, through this comprehensive approach, [the school administrative board] has understood that it's not enough to just throw gadgets into classrooms or to give them to teachers and pupils. There must also be smart activities and how to use them, so the gadgets become productive tools. (upper compulsory school principal 1)

The principals expressed three individual objects (Table 3) which more specifically describe the debt. The first of the three individual objects was described in terms of (O13) equality as

> It didn't look very equal between schools. There's a rather large difference between lower compulsory schools in the municipality … large schools have larger budgets which meant that access to digital resources was very unequal between schools. So, the school administrative board invested so that everyone got the same resources, and then the need for competence was born. (lower compulsory school principal 1)

Equality here is expressed in terms of equal access to edtech, where the same technologies for everyone may be assumed to be a necessary condition. Another side of equality was that the use of edtech in schools depended on the adequacy of teachers and/or principals' digital competence:

> There's a rather large consciousness and understanding within the municipality that there was a large difference between schools. It was, rather loosely, up to individual principals to drive the matters of digital competence, digital tools and resources. (upper compulsory school principal 1)

Equality here is expressed in terms of that, for children to get equal teaching, principals and teachers need a certain level of digital competence and/or that all principals doing the same thing (Leading Digitalization) also means that they will 'drive matters' equally.

The second object (O14) was specifically described in relation to governing documents, such as national curricula and the 2017–2022 national digital strategy, for example:

> … our national curricula include [digitalization] so we can't not work with it
>
> …
>
> And our internal [municipal] documents stated that we did not work with this very much. (kindergarten principal 1)

In other words, there is an object entailing that municipalities ought to follow official national governing documents by digitalizing schools.

The third and final individual object in relation to debt, and the least mentioned in relation to Leading Digitalization, was described in terms of that the principals themselves requested that the municipal school administrative board do more regarding digitalization and that the board was responsible to a considerable degree. Rather than an object regarding 'equality in schools' or to comply with government documents, this object (O15) seems more in tune with a belief that

digitalization is a municipal-wide joint responsibility and a bottom-up need, rather than (only) the individual responsibility of schools/principals and top-down.

The individual objects in Table 3 comprised a small portion of the individual interviews. There are (at least) three individual objects, all relating to a shared historical object, however, no two principals said the same thing. For example, the upper compulsory principals both explicitly used the term 'digital debt', however, one attributed this to equal access to digital technologies (i.e., every school ought to have the same) and the other to equal use of the technologies (i.e., every school ought to have principals/teachers the same digital competence; first quote of this section).

In relation to edtech objects, techno-fundamentalism may underpin much of the municipality's work concerning a possible digital debt. Specifically in terms of the assumption that using digital technologies would prove positive if more effort and resources were rallied and put to work, rather than gadgets being 'thrown in'. The 'equality' object (O13) also seems to require the assumption that individual differences between schools' access to digital technologies and school leaders' and teachers' digital competence are problematic. The 'national governing documents' object (O14) is interesting since this line of reasoning bypasses traditional edtech objects (Table 1) completely and simply enforces that digitalization must be in schools. And following this could mean that, for example, national curricula can be followed by simply committing considerable resources to edtech. The 'municipal-wide engagement' object (O15) seems somewhat in line with communitarianism in terms of building a communal utopia, except not in counter-cultural terms, and in line with anti-institutionalism in terms of bottom-up, except not in terms of setting individuals free (Table 1).

Interviews – what is digitalization in schools?

When the principals were asked to describe their own work in their school and what 'digitalization in schools' is, this seemed to be interpreted as a question relating to positive possibilities and opportunities of edtech. Many of their descriptions were more general rather than with examples from their own school although examples were given when asked. The individual objects of digitalization in schools are illustrated in Table 4.

The first object (O16) concerns digital technologies as a tool for teachers' work. Specifically, they expressed that digital technologies are effective (i.e., making daily work easier, and more professional) for documentation, planning, teaching, structuring and communication.

The second object (O17) concerns a relation between home and school, specifically that the 'school use' of digital technologies is necessary considering the use at home. The use at home was described either in terms of no use at all, and then school use contributes what is not at home yet necessary (i.e., equal access), or that use at home is just one thing (e.g., leisure as games or social media) and that this use is wanting (i.e., 'proper learning').

The third object (O18) concerns supposed positive opportunities that digital technologies 'bring' to teaching and learning. For learning, these were described in that digital technologies equal learning that reflects 'our time' and/or the 'real world', and a focus on producing. For teaching, digital technologies were described in terms of (a) a generally 'helpful' tool specifically for different subjects, (b) they are as natural as any other tool for teaching, (c) can provide individualized teaching, (d) increase quality/efficiency of teaching and (e) access to teaching (i.e., during a pandemic or on weekends).

The fourth object (O19) concerns the materialization of national curricula via edtech: that using the technologies is evidence that national curricula are realized and/or a way for principals to explain that chosen digital technologies are in classrooms with national curricula as a rule.

The fifth object (O20) concerns the role schooling has in educating young people so they become citizens in a future society (e.g., after compulsory schooling), and that this society is digitalized. As such, by digital technologies being in schools, teachers teaching via digital technologies and about digital technologies, and students using the technologies, students become prepared for the future.

In other words, digital technologies are one 'obvious' way to educate for the future and even if technologies of today are not concretely those of the future they are the best they have/know.

The sixth and final object (O21) regarding what 'digitalization in schools' may be, concerns functionality and access to enough digital technologies. Moreover, if they function (e.g., the internet works) and everyone has technologies (i.e., one-to-one and access to appropriate software) digitalization ought to happen.

Three of the objects that concern what digitalization in schools is were mentioned by most of the principals for, one could say, traditional schooling objects: O16 (daily work by teachers), O18 (learning and teaching), and O20 (preparing students for the future). As with the debt objects, an underpinning of techno-fundamentalism seems clear, specifically for O16, 17, 20 and 21. There seem to be few times, spaces or places where edtech in schools is something other than improving and a given part of life.

Also in line with the debt object, national curricula are prominent (O19). Here, there is a possible dialectical use of national curricula in relation to edtech, or vice versa: edtech can (must) be implemented to follow national curricula, and/or national curricula can justify municipal top-down edtech implementation to school leaders and teachers, for example, in terms of '[digitalization as] staying up to date with what we're supposed to be doing according to national curricula (upper compulsory school principal 1)'.

Development plans

The development plans all include long-term 'effects', most often on a three-year perspective however some plans are shorter. What stated as effects in the plans are shown in Table 5 and included as shared objects, considering that these effects are the explicit results of the shared work of principals and teachers.

Three objects are included in many plans, concerning the (a) daily use of digital technologies (O22) which entails a techno-fundamentalistic digitalized school, (b) a sharing culture where teachers share their digital knowledge and resources (O25) so that other teachers use them and thus enacting counter-cultural communitarianism against 'individual' teacher work and (c) that in terms of learner-centered learning pupils and students will increase their knowledge (O27). Taking these three together, one may be tempted to assume that when digital technologies are used daily, they will lead to increased learning,and that what is eventually behind any success or failure to increase learning (or achieve daily use) is the 'culture' of teachers.

As was the case regarding the interviews, governing documents (i.e., national curricula) are figures in the plans, albeit not often, as an object outside traditional edtech objects. The 'digital strategists' and their use in object 24 refers to two work roles that the school administrative board created and filled to 'support' both principals and teachers regarding digitalization.

Synthesis

What has been described as the debt object, interpreted from the principals' answers regarding why Leading Digitalization was undertaken in the municipality, likely orients much of the work regarding digitalization in the municipality's schools, and specifically the work of principals and some of their teachers. In other words, the digital debt could be considered a 'primary' historical object, orienting the community of schools within the municipality (cf. Engeström 2015). The notion of digital debt begs the question of who is indebted to whom. Is it the schools that are indebted to each other and the pupils to provide equal opportunities to/via equal access to edtech (e.g., O13)? Is it the principals who are indebted to the school administrative board, where they believe that to follow national curricula edtech is required (e.g., O14)? Is it the school administrative board that is indebted to the principals for providing comprehensive implementation projects (e.g., O15)? The three individual objects directly related to the debt (Table 3) can provide both

compartmentalization (i.e., it is one of the objects and not all) and they can provide a total of the debt (i.e., all objects need to be 'fulfilled'). Whatever the case, the digital debt 'solved' by the principals working with digitalization is described substantially as an internal affair of the municipality.

However, when considering the debt object in relation to the objects of 'what digitalization in school is' (Table 4) and the seeming conformity to techno-fundamentalism, a more developed foundation for the debt may be interpreted. One that steps beyond the individual municipal case. Specifically, what digitalization in schools may be interpreted to be according to the principals is not least a relation between, on the one hand, the foundation of teachers' work (O16), of teaching and learning (O17–18), of children's future (O20), on the other hand, a vision of society based on digitalized techno-fundamentalism. Put differently, schools must be developed in accordance with digitalization in schools as the assumed digital future age. This point – digitalization in schools with the meaning of digital school of the digital future-age – can also be interpreted to be a possible shared object of the Leading Digitalization documents (Table 2): society's future is digital (O1) so school development must digitalize both schools as organizations (O2–6, 9–12) and learning and teaching culture (O7–8). In light of this, a reasonable interpretation of the municipality's debt object is that this is not only a local affair, it is also a relation to society (Engeström 2015; Leontiev 1978; Roth 2014), where the digital debt is the 'recontextualized' motive/object of digitalized school practice.

Regarding the future of the municipality's schools, the development plans can be interpreted as crystallizations and operationalizations of the future. Considering the objects in Table 5, the future may be interpreted as everyday schooling, where edtech is used daily and even all the time. If the development plans are answers to consolidate the digital debt, what the behavior is that has caused the debt seems to have been, on the one hand, that edtech has not been used daily, naturally, frequently, in teaching, for sharing, etc., and on the other, that edtech has not to lead to 'improvements' such as children being producers, receiving individualized teaching, achieving increased learning outcomes, etc. Regarding the former, one likely contributor to these objects is national curricula that include digitalized teaching in most subject learning. Regarding the latter (possibly) missing improvements, likely contributors are the edtech objects.

Discussion and concluding remarks

In answer to the purpose of the paper, digitalized school practice as a policy-driven hyped digitalization in schools seemed to work through the principals of the study with little 'resistance' in terms of the principals becoming policy actors (cf. Ball, Maguire, and Braun 2012). While the Swedish school governing context is unique, edtech objects and general political hype of edtech in schools is international (Eickelmann 2018; Ottestad and Gudmundsdottir 2018; Selwyn 2022) and these elements' contribution to principals' work and school leadership in schools is the cause for more research in other contexts and with comparative approaches (cf. Williamson et al. 2019). In the study's case, the hype of edtech was carried through various processes – from national policy as prescribed by the national education agency and implemented by municipal governing to principals' work with school development with teachers – and finalized in development plans. Considering that teachers are responsible for achieving the development plans' effects which center on the daily use of edtech in teaching and learning, digitalized school practice is effective in terms of staking out a direction that has implications for everyday teaching and learning (cf. Selwyn et al. 2018). However, the meaning that is given edtech in schools is complex. The analytical framing contributed to understanding meaning as both individual and shared objects, both within the municipality's activity systems (schools) and amongst the principals, and beyond to edtech objects and digitalized school practice. Moreover, the analytical use of activity theory provides a theoretical contribution to education policy research, where activity theory can, considering its long history in education research (Roth and Lee 2007) contribute with new and complementary analyses to a

field seemingly more inspired by socio-technical imaginaries (e.g., Rahm 2023), sociomateriality (e.g., Decuypere 2016) and discourse (e.g., Ball, Maguire, and Braun 2012).

A major empirical contribution of this article is the digital debt. In previous Swedish and international educational research, a focus has been on perceived difficulties and paths to innovation via edtech for school leaders (e.g., Agélii Genlott, Grönlund, and Viberg 2019; Dexter 2018; Håkansson Lindqvist and Pettersson 2019; Hauge 2016; Ilomäki and Lakkala 2018; Ottestad 2013). Although such research focus acknowledges school digitalization policy as important for school leaders' work (Håkansson Lindqvist and Pettersson 2019; Mårell-Olsson and Bergström 2018), few have investigated concretely if, and if so then how such policy works in relation to principals. The study reported in this article found that through digitalized school practice, principals may give the meaning of *digital debt* to the relation of *individuals in society* (Leontiev 1978; Roth 2014). This may be taking the assumption of the principal's responsibilities of school development (cf. Lundström 2015) via edtech beyond what can reasonably be expected of edtech in schools (e.g., Cuban 2001; Säljö 2010; Selwyn 2022).

What is at stake when the mutually constituting relation of individuals in society instead is given a seemingly unidirectional relation of digital debt, is confounding the concrete use of digital technologies in schools with ideology, marketing and hype (cf. Ball and Grimaldi 2022; Karlsohn 2009; Selwyn 2016a; Williamson et al. 2019). When this becomes the case, one must seriously consider 'what is done with these technologies in the name of education' (Selwyn 2013, 6).

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