School organisers’ expression on the expansion of the access and application of digital technologies in educational systems

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Abstract

Purpose – This paper is aimed at describing and analysing what school organisers express when they network to expand the access and application of digital technologies in educational systems. Digital technologies develop rapidly in society, creating challenges and opportunities in people’s lives. Schools have an important task: to prepare young people for a future permeated by digital technology.

Design/methodology/approach – Participant observations and semi-structured interviews were used to describe and analyse how school organisers describe digitalisation work in the educational system.

Findings – The findings show that school organisers describe digital competence and providing support to schools as being important for expanding the access and application of digital technologies in the educational system. They also talk about equality connected to digitalisation work, changes in organisations, the importance of a holistic perspective, and a gold thread. They furthermore explain that networks, a sharing culture, good relations, and good communication enable digitalisation work. In addition, they point out that the lack of time, attitudes towards digital technologies, the lack of digital competence, and resistance to change are some of the constraints for digital technologies in the educational system.

Practical implications – School organisers need to implement digitalisation policies, which can be problematic because they work strategically to support operational activities.

Originality/value – This paper contributes knowledge about school organisers’ work to expand the access and application of digital technologies in the educational system.

Keywords Challenge, Digital competence, Digital technology, Opportunity, School organiser

Introduction

Digital technologies in societies have increased during the past few years, creating challenges and opportunities in teaching and learning conditions (Brunetti et al., 2020; Francom, 2020; Selwyn and Facer, 2014). Educational systems are about change processes, which in this paper are defined as the processes involved in expanding the access and application of digital technologies in schools. These change processes require knowledge about how school organisers should organise digitalisation work in schools (Håkansson Lindqvist and Pettersson, 2019) for a changing culture (Christensen et al., 2018). Fischer et al. (2020) argued that the technologies and approaches designed to apply technology in educational actions can be understood as an attempt to align with or challenge the implied or current practices.
School organisers are responsible for working with the needs and prerequisites of schools. They are charged with creating opportunities for school leaders and teachers to expand the access and application of digital technologies in teaching and learning. The availability, accessibility, and quality of digital technologies influence how digital technologies are used in teaching and learning (Organisation for Economic Co-operation Development (OECD, 2021)), affecting students’ outcomes and equality both inside and between schools in a municipality (Bulman and Fairlie, 2016). The latest digitalisation strategies in many countries are aimed at increasing the importance of using digital technologies to gain knowledge and to achieve equality (van der Vlies, 2020). New digital technologies are fast, sparking the need for digital competence, which should be seen as a condition for lifelong learning. How school organisers plan and execute the expansion of digital technologies in schools from a municipality perspective requires organisation, leadership, and digital competence (Christensen et al., 2018; Dexter and Richardson, 2020). However, how school organisers organise digital technologies in educational systems is lacking. This paper contributes to filling this gap.

With this short background, this paper aims to describe and analyse what school organisers express when they network to expand access and application of digital technologies in educational systems.

(1) How do school organisers express their digitalisation work in municipality schools?

(2) What enables and constrains school organisers’ digitalisation work in municipality schools?

**Background**

During the past few years, many educational policy decisions have emerged amid several attempts to expand the access and application of digital technologies in educational systems, which have increased worldwide. Unfortunately, many of these attempts have neither achieved the expected effects in classrooms (Cuban, 2013; McGarr, 2009) nor improved school equality (Bulman and Fairlie, 2016; Jacob et al., 2016). Baek et al. (2008) and Ringstaff and Kelley (2002) highlighted an insufficient infrastructure, inadequate access to digital technologies, the lack of digital competence, limited access to expertise, the lack of support, and attitudes towards digital technologies as some barriers to digitalisation work. Vanderlinde and van Braak (2010) highlighted the organisation’s importance in supporting the change process in education. Managing, organising, and steering a top-down strategy is considered to be crucial to individual schools’ success and to educational changes (Bryk, 2010; Harris et al., 2021; Harris and Spillane, 2008). However, Pettersson (2021) pointed out that digital technologies themselves embrace digitalisation processes “without pedagogical and organisational change” (p. 187), and insight into digital competence concerning organisations and leadership is limited (Pettersson, 2018). According to Olofsson et al. (2015), school organisers should ask why digital technologies should be “an obvious part of the school organisation and the learning activities” (p. 117).

Mingaine (2013) pointed out that school organisers’ and school leaders’ behaviours and positive attitudes towards the process of expanding digital technologies are important for involving and activating teachers in this process. Even Hish and Segolsson (2019) highlighted the importance of school leaders’ attitudes towards teachers when it comes to giving legitimacy to school development work. They explained that how a municipal school organiser prioritises school development work influences the school leaders’ attitudes towards the work and thereby teachers’ views of the development work.

Using digital technologies should be seen as a lifelong learning process because it develops a quickly increasing need for digital competence. Jaldemark (2021) described lifelong learning as “a boundless holistic phenomenon” (p. 29) of learning processes in
people’s private and public lives. Fischer et al. (2020) stressed that “learning in today’s world must conceptualize learning as an inclusive, social, informal, participatory and creative lifelong activity” (p. 244).

The expansion of digital technologies in the educational system entails challenges given their effects on teaching and learning. Gupta et al. (2022) emphasised that “the success of education depends upon the ease with which an individual can access the requisite education material and interact with the teachers/other students and institutional administrators” (p. 4). Digital technologies, which comprise both hardware and software, should contain user-friendly interfaces, which is not always the case. In a systematic mapping study, Gallud et al. (2022) explained that the introduction of hardware and software has been challenging in education because it is difficult to demonstrate the impact of the user interface on the use of digital technologies in learning and teaching.

Digital technologies in schools require infrastructures, which require organisational knowledge (Somekh, 2008). Ottestad (2008) explained that learning organisations and digital technologies in schools are interconnected at different levels of education, and this requires network interaction. Vanderlinde and van Braak (2010) discussed schools’ capacity to “foster effective change through digital technology” (p. 542).

School organisers are responsible for creating opportunities for teachers and school leaders to work with national policy documents such as the Education Act, the curricula, and the school ordinance (Government Offices of Sweden (SOU, 2015, p. 22)). School organisers are also responsible for transforming written strategies into actions. At the same time, Ellis et al. (2021) pointed out that many school organisers do not feel well prepared to integrate digital technologies into their schools effectively. Gonzales (2019) explained that school organisers face critical challenges related to budgets, sustaining the organisation of digital technologies in schools, and negotiating and setting expectations for teaching and learning.

Method
In this study, the approach used to collect data is participant observation (Cohen et al., 2011) and semi-structured interviews (Denscombe, 2017; Kvale and Brinkmann, 2009). The researcher’s participation in this observation method is participant-as-observer, which means that the researcher “is part of the social life of participants and documents and records what is happening for research purposes” (Cohen et al., 2011, p. 465).

Data were collected in the framework of a project involving three municipalities in Sweden. The project acted as a catalyst for school organisers’ efforts to enact the Swedish (2017) national strategy for the digitalisation of the educational system (Swedish Government, 2017). Its aim was to contribute knowledge about how digital technologies should be organised in education, thus creating a sustainable and relevant digitalisation culture in schools. As part of the project, the school organisers shared their knowledge and experiences related to how they organise digital technologies in their schools. A school organiser represented every municipality. Education managers, IT strategists, and school leaders represented the school organisers for these municipalities. They participated in nine observations that lasted for about three hours each between November 2018 and January 2022. These meetings generated 339 pages of transcriptions, meeting protocols, and notes. Each observation included a meeting among these municipalities. In the meetings, one of the municipalities was the host and provided detailed reporting on current digitalisation activities. These meetings also included presentations of current research on digitalisation in schools from senior researchers and doctoral students, as well as discussions on the three municipalities’ digitalisation work statuses. Five of the meetings were conducted via video conferencing due to the pandemic. This paper defines the three municipalities as A, B, and C. The meetings involved about 12 individuals. Three doctoral students and one associate professor represented the university. The number of representatives
for each municipality varied among the meetings. For instance, sometimes a municipality had one representative in one meeting and three representatives at the next meeting. In addition, 14 semi-structured interviews were conducted with the school organisers’ representative IT strategists between 2019 and 2021. These IT strategists were interviewed because they are a link between education managers and school leaders in their municipalities’ digitalisation work. During this period, the six respondents were the same, but the number of participants in each interview varied between one and two IT strategists. The interviews were between 30 and 60 min. These interviews generated 118 pages of transcriptions. In total, 457 pages of transcriptions, meeting protocols, and notes were analysed.

The method used to categorise their expressions in the collected data is thematic analysis (Braun and Clarke, 2020). The collected data were categorised into four themes. The first two themes are based on the Swedish digitalisation strategy (Swedish Government, 2017): how school organisers work with digital competence and equal access to and the application of digital technologies in education. The last two themes are based on the second research question. They are about the challenges and opportunities that enable and constrain the expansion of the access and application of digital technologies in schools.

Findings
This chapter presents how school organisers collaboratively discuss and negotiate different aspects of digitalisation, as well as the challenges and opportunities that enable and constrain digitalisation work from a school organiser’s perspective.

School organisers express digital competencies
Digital competence for all in the chain of command. Municipalities A, B, and C emphasised the importance of digital competence for all in the chain of command. When working with digital is difficult and time-consuming, “a lot of the work we do is analogue” (C, 28 April 2021), with influences the equality in and between schools. Both A and C spoke about the importance of using a checklist based on the lowest level of digital competence to increase teachers’ digital competence. Checklists made clear what “every teacher should know” (A, 7 December 2020) and “every teacher should be able to do” (C, 28 April 2021). However, C pointed out that “it is important to have the lowest level of digital competence, but you also need to raise it” (C, 28 April 2021). B talked about the importance of using the proper language to help teachers to understand that “this way of working is not linked to a place in Google. This is a way of working linked to digital technologies” (B, 24 March, 2021). Teachers’ digital competence is important for continued digitalisation work as well as change methods for working with digital technologies. This is why it is important to know “how the competencies in our schools look like in 5 or 10 years” (B, 24 March, 2021).

Students as producers of digital technologies. A described the act of making students producers instead of consumers of digital technologies. “Students watch a lot of YouTube, and play different games, they actually consume what digital technologies give them” (A, 3 September 2021). The municipality created a network for teachers, offering opportunities for them to share their knowledge and experiences to increase their teaching-related digital competencies. This will ultimately help their students to become producers of digital technologies.

IT strategists support schools’ digitalisation work. The municipalities have IT strategists who work directly with schools and are competent in both technical and pedagogical perspectives. Thus, they are able to support schools in their digitalisation work. These IT strategists have backgrounds as teachers or school leaders and work according to the schools’ needs and conditions. School organisers also support teachers’ pedagogical work in using digital technologies. A pointed out how important it is for schools to get easy access to
IT strategists and explained that “the digital technologies solutions for computers and infrastructure are connected to the municipality’s IT department and schools’ interests should be in the centre” (A, 26 November 2021).

**Equality in and between schools.** Increasing digital competence in the chain of command may increase equality in and between schools, as it influences teachers and school leaders to plan, organise, and use digital technologies in teaching. However, problems arise when decisions need to be made because those who sit as decision-makers usually “do not know what they do not know,” which leads to “decision-makers sometimes saying no to something they do not know what they say no to” (A, 21 February 2022). Therefore, the need exists for a group of decision-makers with different competencies; for example, when the procurement of digital technologies takes place, “public procurement is not easy” (B, 26 November 2021).

**Changing working methods using digital technologies.** Increasing digital technologies in schools does not automatically lead to improved teaching and learning, according to school organisers. For example, teachers may write using computers instead of using paper and pen, conduct laboratories at school with software, and dissect frogs without the frogs needing to die, but “teachers’ working methods have not changed yet through digitalisation” (B, 26 November 2021). Therefore, teachers needed digital competence.

**School organisers express expanding the access and application of digital technologies.**

**Digitalisation requires investment.** Expanding the access and application of hardware in schools involves implementing Chromebooks, iPads, and computers. C explained that “it is a pretty big investment” (C, 24 June 2020). However, digitalisation is a process that should permeate teaching; “it is changing with digital technologies” (C, 28 April 2021). Access to digital technologies, digital systems, a digital infrastructure, and digital competence should support and facilitate teachers’ and school leaders’ daily work. However, this is difficult to achieve as these decisions are made at the school organiser level. According to C, school leaders are seen as customers, and teachers and students are users.

**Interfaces in software.** The expansion of software in schools was about the purchase of, for example, apps, computer programs, and systems. The users’ (teachers’ and students’) perspectives and the suppliers’ perspectives are important when software is built or implemented. According to C, “if the usability of a computer program or system is bad and the user-friendliness is low, then it does not matter how good of an intuition you have, and how good the system’s functions are” (C, 17 February 2021). Software interfaces are important for determining whether the software is useful or not. It is important to know about different systems by comparing them. Then, it is possible to choose a useful system for a specific municipality school or for all municipality schools “by weighing the user-friendliness against the user” (A, 21 February 2022).

**Equality in and between schools.** Equality in and between schools regarding the access and application of digital technologies is an aim of the three municipalities. However, inequality can exist “depending on the school focus or what they buy-in and so on” (A, 3 September 2021). Equality in schools is an important issue, and “to get access to support should be easy and fast,” according to C (28 April 2021). The pedagogical perspective should permeate the IT department’s support for schools, which is why “it is important to build a relationship with the IT department and give them the pedagogic perspective” (C, 28 April 2021).

**Application of digital technologies.** Students should be able to use digital technologies to produce pictures, videos, and sounds. Unfortunately, “in preschools, digital technologies have sometimes been used as a tool for childcare, for example when colleagues were ill,” according to A (3 September 2021).

**IT strategists supporting schools’ digitalisation work.** IT strategists interact with school leaders and teachers by “talking to the schools, working with them, writing feedback to them...”
and analysing” (B, 24 September 2020). However, working with digital should be the norm for teaching and for the school’s administrative organisation. At the same time, “there is competition for school leaders’ time” (B, 17 February 2021). According to C, to compensate for the lack of competence in the expansion of digital technologies in schools and to support school leaders, the school organiser employed IT strategists for digitalisation work. These IT strategists also provide politicians with information about schools’ digitalisation work.

School organisers express challenges in digitalisation work

Lack of time for digitalisation work. The lack of time seems to constrain participation in digital competence efforts, which influences the act of turning students into producers. This is because the lack of digital competence constrains teachers’ use of digital technologies, which affects teachers’ work methods. “A big challenge for teachers is to do things differently” (C, 21 October 2020).

IT department as downpipe. Another challenge in digitalisation work involves clashes between the IT department’s interests and the schools’ needs. C explained that “obvious, it should be pedagogy that determines the school’s need of technology and not what the IT department tells the school to use” (C, 28 April 2021).

Communication in the chain of command. Communication in the chain of command and with stakeholders influenced school organisers’ interest in digitalisation work. Unclear communication caused the school organisers to “not really see what digital technologies had to do with students’ results” (B, 24 September 2020). This may influence the gold thread in expanding the access and application of digital technologies in schools. Communication about the relationship between education and digitalisation needs to be clear, credible, and trustworthy. When school leaders did not give priority to digitalisation work in their schools, digitalisation became a lottery for students. Depending on teachers’ interest in digital technologies, “some students were lucky to have teachers who were enthusiastic about digital technologies” (B, 24 September 2020).

Good knowledge of digital technology placed in the wrong place. The staff’s competencies should be used effectively in the municipality’s schools. B explained that “it felt absurd to put that competence in the wrong place” (B, 24 September 2020).

School organisers’ digitalisation work. Digitalisation in education was discussed as schools’ digitalisation and not as something on the school organisers’ level. B pointed out that “I do not really think they have understood that we have a job to do at the school organiser’s level as well” (B, 24 September 2020).

Changes in the organisation. Changes in responsibilities caused the digitalisation work to slow down. These include, for example, changes in school organisers, school leaders, and teachers’ organisations. A stressed that “digitalisation is a means to achieve the goals in our municipality” (A, 20 August 2020); at the same time, it is connected to who leads digitalisation work in municipalities and schools, as well as their attitudes towards digital technologies in teaching. Trust-based management, follow-up, and a holistic approach are necessary to work with digital technologies in schools. According to Municipality A, working with trust-based management has contributed to digitalisation issues that have been discussed from a joint perspective.

School organisers express the opportunities in the digitalisation work

Sharing knowledge and experiences. Availability, collegial learning, and a sharing culture enable digitalisation work in schools and municipalities. Even the possibility of participating in courses, workshops, and seminars is important. Municipality A argued that “it is about sharing everything you can” (A, 7 December 2020), and “it is a platform to share good examples and experiences” (A, 3 September 2021).
Network for teachers. Opportunities that enable students to go from consumers to producers include, for example, a network for teachers, a sharing culture in the school, and digital competence for both teachers and students. In a network for teachers, A pointed out that “everyone was forced to test the digital technologies: it sounds awful, but then you have to try the tool. You could not only lean against your colleague” (A, 3 September 2021).

Good relationship. Good relationships among IT strategists, school leaders, and teachers are important for expanding the access and application of digital technologies in schools. Even a good relationship between schools and the IT department contributes to digitalisation work in the municipalities’ schools.

Digital technology enthusiasts. Enthusiasts about digital technologies are important for digitalisation work, as they are an engine for expanding the access and application of digital technologies in schools. Enthusiasts are school leaders and teachers who have an interest in digital technologies. The municipalities described these enthusiasts as “digital ambassadors” (A, 3 September 2021). B explained that these enthusiasts are important because “they stimulate the internal transfer of ideas, skills, and stimuli, without using too many financial resources” (B, 17 February 2021).

Attitudes towards digital technologies. The school organisers’ attitudes towards digital technologies influenced how school leaders prioritise expanding the access and application of digital technologies in their schools, affecting equality both inside and between schools in the same municipality. However, B emphasised that “it is up to each school leader how much the school will be digitalised” (B, 24 September 2020). In addition, school leaders’ attitudes towards digital technologies may influence teachers’ attitudes towards working with digital technologies, which may be important for involving students in using digital technologies differently. “It is a lot about attitudes” (A, 20 August 2020). Good attitudes towards digital technologies in education enable the expansion of the access and application of digital technologies in schools.

Table 1 presents a summary of the findings in this paper. The first two themes are connected to the Swedish digitalisation strategy. The last two themes are connected to challenges and opportunities in digitalisation work. Therefore, the uncovered sub-themes in this paper have been placed under the respective themes.

Discussion
In returning to the research questions, the first question yielded information about school organisers’ work with the digitalisation of the municipalities’ schools. When school organisers network to expand the access and application of digital technologies in education, they acknowledge the importance of increasing digital competence for teachers and students. Furthermore, they describe digital competence as a condition applying digital technologies in education, which both Baek et al. (2008) and Ringstaff and Kelley (2002) also emphasised. For making students producers instead of consumers of digital technologies, both teachers and students need digital competence.

The school organisers in this study explained that digitalisation work for them is about understanding the change process related to how digital systems influence people and why digitalisation in the educational system is essential from society’s perspective. It is in line with Vanderlinde and van Braak (2010), who pointed out the importance of organisation in digitalisation work. At the same time, Olofsson et al. (2015) pointed out that school organisers need to understand the reason for organising digital technologies in education. However, Pettersson (2018) explained that more research on school organisers’ digital competence is needed. According to school organisers, digital competence refers to how school leaders and teachers use digital technologies in teaching, which Bottino (2020) stressed as being crucial for achieving quality in expanding the access and application of digital technologies in schools. It also influences students’ opportunities to learn and develop as well as their results.
in school. Digital competence can be seen as a process that Jaldemark (2021) described as a learning process in people’s lives. Even Fischer et al. (2020) stressed that learning should be seen as an ongoing activity in people’s lives.

School organisers have employed IT strategists to support school leaders, teachers, and students in working with digital technologies that benefit students’ learning and development, influencing equality in and between schools. Both Pettersson (2021) and Baek et al. (2008) emphasised the importance of support and access to expertise for successful digitalisation work. School organisers have also explained that digital competencies and support are crucial for successfully expanding digital technologies in schools. However, when school organisers talk about digitalisation in the educational system, they are referring to the digitalisation of teaching. This does not frame the digitalisation of school organisers, which influences how decisions are made.

According to school organisers, applying digital technologies in education requires changing working methods, which even Pettersson (2021) emphasised. Furthermore, the application of digital technologies in education needs to be connected to the pedagogical perspective because it influences if students become consumers or producers of digital technologies.

Digital technologies in schools are investments and resources for school organisers and schools, which Gonzales (2019) saw as a challenge for school organisers. At the same time, school organisers point out that digitalisation is all about taking advantage of what one has in one’s organisation and organising based on that, for example, putting the right competence in

| Digital competence | Access and application of digital technologies | Challenges | Opportunities |
|--------------------|-----------------------------------------------|------------|---------------|
| Digital competence is necessary in the school's entire chain of command | Increasing access to digital technologies is resource-intensive | Lack of time for digital competence in schools. Resistance to changing work methods | Network and share culture in and between schools |
| Using a checklist based on the lowest level of digital competence to increase teachers’ digital competence | The access and application of digital technologies influence equality in and between schools | Competence is in the wrong place | Positive attitudes towards digital technologies |
| Create networks for teachers as well as opportunities to share knowledge and experiences | Digital competence is a prerequisite for using digital technologies in teaching | Unclear communication in the chain of command | Enthusiasts have an interest in digital technologies and are important for digitalisation work |
| Increase students’ digital competence, making them producers of digital technologies | Interfaces in software influence how digital technologies are used | Clashes between interests and needs (IT department and schools) | Opportunities for systems, Wi-Fi, and cloud service |
| Give schools support for digitalisation work and access to IT strategists’ competence | Strengthen the relationship and communication between the IT department and schools | Difficulties in using hardware or software (i.e. trouble logging in or computer program interfaces that are not adapted to schools) | To build a gold thread and increase the holistic view |
| It is necessary to change work methods to foster the use of digital technologies in teaching. This translates to a need for digital competence | Increase the IT department’s understanding of schools’ needs concerning digital technologies in education | School organisers’ idea that digitalisation is about schools’ digitalisation | Good relationship between schools and the IT department |

Table 1. Themes and sub-themes
the right place and using digital technology enthusiasts in one’s digitalisation work to reduce costs.

School organisers’ responsibility is to create opportunities for school leaders to lead digitalisation work in their schools by enabling networks, sharing cultures, and digital competencies for teachers and students. According to both Somekh (2008) and Ottestad (2008), digitalisation is about organisations and networks that enable the expansion of the access and application of digital technologies in schools. At the same time, school organisers stress that they compensate for their lack of digital competence by employing IT strategists with both technology and pedagogic knowledge, thus creating organisations that support schools’ digitalisation work.

The second research question revealed what enables and constrains school organisers’ digitalisation work. School organisers pointed out that collegial learning, a sharing culture, digital competence, positive attitudes towards digital technologies, good relationships and communications, and enthusiasts are important components enabling digitalisation work. School organisers’, school leaders’, and teachers’ attitudes towards digitalisation are important for digitalisation work, according to both Mingaine (2013) and Hish and Segolsson (2019). In addition, teachers’ attitudes towards digital technologies can enable or constrain the expansion of digital technologies in schools, influencing, for example, digitalisation work with students as producers instead of consumers of digital technologies. School organisers’ attitudes towards digital technologies influence school leaders’ digitalisation work as well as teachers’ use of digital technologies in teaching and learning. A positive attitude towards digital technologies in schools may positively influence digitalisation work; however, a negative attitude may negatively influence the work.

The school organisers pointed out that the lack of time, the lack of digital competence, the lack of resources, clashes between the IT department’s interests and the schools’ needs, trouble with hardware and software, resistance to changing work methods, or the idea that digitalisation is only for schools are some constraints for digitalisation work. Gupta et al. (2022) emphasised the importance of access to digital technologies, which require resources, to foster successful digitalisation in schools. Gallud et al. (2022) pointed out that a gap exists between user interfaces and digital technologies in education, so this subject requires more research.

School organisers enable digitalisation work by providing politicians with information about how digital technologies influence students’ lives for future decisions, as well as information about the required conditions in schools, such as digital competence at a school level.

The organisation of digital technologies in school municipalities is a school organiser’s issue because digital technologies can be used to support effective change, according to Vanderlinde and van Braak (2010). However, it is almost impossible for a single individual to make changes that the organisation fundamentally needs, leading to a changed view of knowledge and learning. Therefore, changes in organisations make digitalisation work difficult for school organisers, bringing opportunities and challenges for teaching and learning. At the same time, it is an important issue because it concerns students’ access to new methods and possibilities in teaching that may improve their results, which Gupta et al. (2022) emphasised as being key for education.

The complexity of school organisers’ organisation to support school leaders’ digitalisation work requires future research. For example, this research could involve a deeper study of how digital competence influences school organisers’ understanding of digital technologies in education and how school organisers work with expanding digital technologies in schools.

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