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THE ROLE OF DIDACTIC CONDITIONS IN THE USE OF DIGITAL TECHNOLOGIES BY TEACHERS OF TECHNOLOGICAL EDUCATION

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ABSTRACT

Researchers concerned with the digitalization of the K-12 school have contributed insights and understanding of what an increased uptake and use of digital technology in school has meant in terms of possibilities and challenges for school leaders, teachers and students (Olofsson et al. 2015; Nordén, Mannila, and Pears ; Willermark). In this article, the focus is on a central aspect of the digitalisation of the K-12 school – digital competence – and specifically teachers’ digital competence (Krumsvik et al. 2016). In Sweden, the question of digital competence has been put in the spotlight due to the national strategy for the digitalization of the K-12 school system launched by the Swedish Government in 2017 (Government decision I:1, supplement). The strategy consists of three focus areas: (1) digital competence for all in the school system, (2) equal access and use of digital technology and (3) research on and follow-up of the possibilities of digitalization. In the strategy, adequate digital competence is used in relation to children and students and is said to be a concern for everyone in the school system, i.e. children, students, teachers, school leaders and other members of staff. The strategy has led to changes in the curriculum for the compulsory school, preschool class, school-age educare and upper secondary school. According to the Swedish National Agency for Education , digital competence can be divided into four areas: (a) to understand the impact of digitalization on society, (b) to be able to use and understand digital tools and media, (c) to develop a critical and responsible approach and, finally, (d) to be able to solve problems and translate ideas into action. In the national strategy, children’s and students’ digital competence is discussed in terms of “adequate digital competence”. It may therefore be reasonable to expect teachers’ and school leaders’ digital

competence to be discussed in the same terms, although this is not the case in the strategy. However, in earlier preparatory work, the notion of “adequate digital competence” is discussed in relation to children and students and teachers and school leaders (The Swedish National Agency for Education. Here, we argue that it is reasonable to expect that teachers and school leaders will also need to have some kind of “adequate digital competence” in order to be able to support children’s and students’ development at their “level” of “adequate digital competence”.

KEYWORDS: *Children’s and students’ digital competence, Information and data literacy, (b) Communication and collaboration, (c) Digital content creation.*

INTRODUCTION

In a recent study, Fransson, Lindberg, and Olofsson (2018) analyzed the Swedish national strategy for the digitalisation of the K-12 school system with the aim of teasing out the possible meanings of adequate digital competence at a conceptual level. The authors mean that in the strategy the notion “adequate” appears to be both vague and wide, that it can be understood in relation to most aspects of education and thereby be difficult for stakeholders in school to contest or even neglect. The authors conclude that the notion of “adequate” needs further interpretation and discussion, with empirical resonance from school and different representations of how teachers’ adequate digital competence is displayed in practice. Therefore, in this article, the focus is on teachers’ adequate digital competence – in policy and practice – with an aim to explore how enacted digital competence in three Swedish upper secondary schools appears, and thereby provide an empirical account of what “adequate” might mean in practice.

With this approach, this study also contributes to an understanding of how policy is interpreted, transformed and enacted (Ball, Maguire and Braun 2012). In such policy-formation processes, opportunities for different actors to be involved and display agency are important. As agency reflects “the capacity of actors to critically shape their own responsiveness to problematic situations” (Emirbayer and Mische 1998, 971) it should be viewed as something that is achieved rather than given; Agency is achieved in relation to structural conditions, local circumstances, values, personal efforts and resources. Personal resources can be experiences, skills, knowledge about context and how policy operates, or how to perform micro-political negotiations (Kelchtermans 2007). In this article, the resources mainly refer to digital infrastructure and teachers’ competencies, values and experiences related to digital technologies. Hence, teachers’ resources for displaying agency in certain contexts can help to explain what adequate digital competence might mean and consist of and to understand how the notion of “adequate” is used in policy and practice.

The empirical data utilized in this article consists of four narrative sub-case descriptions based on observational data and interviews with 25 upper secondary school teachers in Sweden concerning aspects related to equal access to and use of digital technologies. The sub-case descriptions explore what adequate digital competence in three upper secondary schools in Sweden might mean and how it is enacted. The reason for only addressing this second area is due to the many alignments between its content and suggestions and upper secondary teachers’ everyday lives in school, where digital technology is used for teaching, learning and administration. Hence, with the intention of creating a framework for the narrative case

descriptions that appear later in the article, we first present possible ways of describing teachers' digital competence, including how it is developed and enacted in school.

Teachers' digital competence

“Digital competence” is a concept that seems to be elusive, in that the preconditions, opportunities and challenges, as well as the contextual and societal circumstances, change. The concept can be used differently in different contexts and by different actors. It also seems to depend on what someone wants to highlight, or whether it is conceptualised in a narrow or wider sense. However, efforts have been made to describe what it could mean. For instance, in the DigComp project, five areas of digital competence are identified: (a) information and data literacy, (b) communication and collaboration, (c) digital content creation, (d) safety and (e) problem solving (Carretero, Vuorikari, and Punie 2017). The authors discuss these areas in relation to eight levels of proficiency in order to discern how digital competence could be played out with various levels of proficiency by various actors in different contexts. In the educational context, the DigCompEdu framework for educators (Redecker 2017) is proposed as a “framework for the development of educators’ digital competence in Europe” (7) The framework focuses on six areas: (a) professional engagement, (b) digital resources, (c) assessment, (d) teaching and learning, (e) empowering learners and (f) facilitating learners’ digital competence, and relates to six levels of proficiency, from newcomer to pioneer. The DigCompEdu framework draws on competences claimed to be of importance for teachers. This can be illustrated by the area of “digital resources”, which highlights competences such as identifying, assessing and selecting digital resources, creating, modifying and managing digital resources, safety, protecting resources and information and sharing digital resources safely, correctly and in accordance with copyright rules.

Further, based on a literature review of 76 educational research articles concerning digital competence, Ilomäki et al. (2016) describe digital competence as the skills and knowledge that citizens need to take part in and contribute to a digitalised knowledge society. However, they also contend that despite their current definition, digital competence is a concept that still needs to be more clearly defined (cf. Pagani et al. 2016). This is interesting, especially considering the vague description of adequate digital competence reported on in this article (see Fransson, Lindberg, and Olofsson 2018). In another literature review, Pettersson (2017) describes that teachers' digital competence is not only something for the individual teacher to take responsibility for, but should be seen as part of a school's digitalisation process (cf. Fransson et al. 2019; Pettersson et al. 2019). Pettersson's (2017) conclusion finds resonance in From's (2017) work and his argumentation for “pedagogical digital competence” (PDC) in educational contexts and activities. According to From (2017), PDC comprises three interrelated levels – a micro-level (interaction level, pedagogical interaction with students), a meso-level (course level, design and implementation of courses as well as the infra-structure of education) and a macro-level (organisational level, educational management and the development of the organisation). The importance of the school organisational level for teachers' development of digital competence is also highlighted in the Norwegian “SMIL study”, which focuses on the use of ICT in upper secondary schools in Norway and involved 2477 teachers. In this study, Krumsvik et al. (2016) conclude that education authorities need to “... implement strategies that support

vulnerable teacher groups in order to increase their individual digital competence (e.g. through continuing ICT education)” (160).

According to Krumsvik (2008), Krumsvik (2014), the why, what and how questions in teaching are generally related to the concept of digital competence and specifically to teachers' pedagogical use of digital technologies. Krumsvik (2008) describes teachers' digital competence as “the teacher/TEs' [teacher educators'] proficiency in using ICT in a professional context with good pedagogic-didactic judgement and his or her awareness of its implications for learning strategies and the digital Bildung of pupils and students” (283). However, matching the description offered by Krumsvik (2008) seems challenging for teachers – both with regard to their own level of digital competence (Olofsson, Lindberg, and Fransson 2017; Sipilä 2014) and when organising learning activities for students' own development of digital competence (Lindberg, Olofsson, and Fransson 2017; Voogt et al. 2013). For example, in a Nordic action research project on the development of teaching in and for a digitalized school, Willermark (2018) shows that teachers are required by school leaders to develop the digitalized classroom, but at the same time are often left wondering what should be developed and how this should be done. Based on the results of a study of Swedish teachers' use of thematic Face book groups, Lantz-Andersson et al. (2017) suggest that answers to such “didactic questions” in a digitalized school context can be sought through social media and that participation in self-organized online learning communities with other teachers can be a rewarding way of continuous professional development (CPD) activity. However, in a Swedish study in an upper secondary school context, Lindberg, Olofsson, and Fransson (2017) argue that teachers often find it difficult to keep pace with the rapid development of digital technology and that the time allowed for CPD to deepen their digital competence, including the practical use of digital technology, is limited. In another Swedish study, teachers' self-efficacy related to the Dig Comp project's five areas of digital competence were researched and the results showed that there was a large spread in the 530 participating teachers' self-efficacy (Mannila, Nordén, and Pears 2018). Higher self-efficacy was related to information and data literacy, while they seemed less confident with competencies relating to copyright, licences and programming. Drawing on the results of a Australian study on the use of digital technology in secondary schools, Bulfin et al. (2016) maintain that it is important for teachers to develop digital capacity and be “... active in seeking to assume an expert role where appropriate, and to take a lead in positively shaping students' exposure to digital technology” (250).

To sum up, research on teachers' digital competence shows that there are challenges related to (a) defining digital competence in educational policy and practice, (b) teachers' current levels of digital competence and the time and contexts for CPD and (c) the degree of readiness at an organizational level for the digitalized school. In short, although the challenges are different in character, there is a common need for additional research-based knowledge. The intention with this article is to contribute knowledge gleaned from the everyday lives of teachers in three upper secondary schools in Sweden. However, before giving an account of the empirical data, the Swedish policy document relating to adequate digital competence in K-12 schools that was launched in October 2017 is presented.

The question of digital competence has recently been moved higher up on the Swedish political educational agenda, mainly due to the national strategy for the digitalisation of the K-12 school

system launched by the Swedish Government. The strategy consists of 14 condensed pages divided into three focus areas: (1) digital competence for all in the school system, (2) equal access and use and (3) research and follow-up of the possibilities of digitalization. In the strategy, digital competence is often formulated as adequate digital competence that is said to frame the future work in school. On page 7 of the strategy, the reason given is that “... adequate digital competence is also used to indicate that it is impossible to specify an absolute level of digital competence when it successively needs to be developed in relation to society’s requirements and children’s and students’ prerequisites” (Government decision I:1, supplement, 2017).

This article explores the possible meanings of the notion of “adequate” in the strategy by expanding the discussion in the above mentioned article by Fransson, Lindberg, and Olofsson (2018). This is done by using our research-based understanding on the preconditions and activities in three schools in which the teachers display and enact digital competence. We apply this understanding in a reflective reasoning on how the teachers and their students develop digital competence and what the notion “adequate” could mean in the context of the strategy’s second focus area of equal access and use. This is done by using observational data and interviews with 25 teachers giving account for the existing local educational practices in three upper secondary schools in Sweden as preconditions for the possible integration and enactment of adequate digital competence in the respective schools. The teachers’ views have been read in relation to the goal stated in the strategy’s second focus area, which is that: “Children, students and staff should have good and equal access to digital tools and resources in order to improve the education and make it more effective” (Government decision I:1, supplement 10, 2017). This goal is further divided into the following sub-goals: (1) children, students and staff who work with children and students should have access to digital tools based on their needs and prerequisites, (2) appropriate infrastructures and technological and pedagogical support should be in place, (3) the digital learning resources that are used in the teaching should be appropriate and result in the technology being used effectively and (4) digitalisation should be used to simplify the staff’s work situation in relation to teaching and administration issues. Within the scope of this article it is not possible to describe the four sub-goals in detail or even to provide a URL link, since the strategy is only available in Swedish. However, three quotations relating to each sub-goal have been translated into English in order to illuminate the characteristic rhetoric in the strategy’s second focus area (6–13).

Sub-goal 1- Children, students and staff who work with children and students should have access to digital tools based on their needs and prerequisites: (a) “Considering the demands placed on staff in the educational system who work with children and students to use digital technology in teaching and administration, it is important that these staff have a good access to digital tools”, (b) “... the general access to digital tools and the use of them amongst children and young people differs according to socioeconomic background and other demographical variables. This underlines the importance of the educational system giving all children and students equal opportunities to use digital tools and to develop their digital competence”, and (c) “In order for digitalisation to have any effect it is important that the responsible authority is active in the development and for example formulates local strategies that connect to national strategies and goals”.

Sub-goal 2 – Appropriate infrastructures and technological and pedagogical support should be in place: (a) “The technology should not constitute an obstacle for a good education. Support functions must be available in order to guarantee interruption-free connexions and that digital tools and other IT equipment works so that the teaching can be pursued without technology-related disturbances”, (b) “It is important for the responsible authority to guarantee that in addition to access to digital tools there is an appropriate and functional infrastructure for the use of digital learning resources as well as school administrative system solutions” and (c) “It is important at the local level to ensure that an appropriate infrastructure is in place with regard to access to a wireless network, sufficient broadband capacity and access to other relevant equipment, as well as access to educational support”.

Sub-goal 3 – The digital learning resources that are used in the teaching should be appropriate and result in the technology being used effectively: (a) “Not only is access to digital tools required in the teaching, but also competence to choose the correct tools and knowing how to use them”, (b) “Digital learning resources and their use in the teaching can develop the teaching and contribute to children’s and students’ knowledge acquisition” and (c) “It is therefore it is important that there is a development and supply of digital learning resources of a high pedagogical, interactive, visual and scientific quality and that fulfil the stated availability requirements”.

Sub-goal 4 – Digitalisations should be used to simplify the staff’s work situation in relation to teaching and administration issues: (a) “Through digitalisation tools and methods can be developed that facilitate the staff’s administration, planning, implementation, follow-up, and evaluation of the teaching. In this respect, the potential of digitalisation must be realised”, (b) “Working environments with for example badly functioning digital tools, system solutions or internet connexions risk leading to an increased administrative burden for preschool teachers, teachers and other staff as well as for preschool school managers and principals” and (c) “The digital solutions that are introduced should be user friendly and make the work more effective. Content and methods should be developed for and adapted to work in a digital environment. Another important component is the access to suitable digital tools in order to follow children’s and students’ development and to analyse the teaching with a view to improving it”.

The next section describes how the content in the second focus area of the Swedish national strategy can be related to the observational and interview data in order to arrive at an understanding of what adequate digital competence in three Swedish upper secondary school practices might be and how it is enacted.

Method and analysis

The article draws on data collected from 2015–2016 in a 4 year Swedish research project carried out by the authors. The project explores how digital technology is used in three Swedish one-to-one upper secondary schools, which means that all the teachers and students have access to an individual laptop and a wireless internet connexion. These three schools are “known” for their advanced use of digital technology for teaching and learning. However, the narratives of advanced use have been projected on all three schools due to certain limited contextual circumstances at the schools or in the municipalities, rather than any widespread advanced use (cf. Olofsson, Lindberg, and Fransson 2017). In School A, this refers to the reputation of the municipality regarding the uptake and use of digital technology in its K-12 schools, in School B

to a specific Centre of Technology within the school and in School C to the school's reputation for its remote teaching and mixture of educational on-site and distance practices. The empirical data used in this article is illustrated in the form of four narrative case descriptions (Eggen and Stobart 2015). These have been constructed from observational data in the classroom and interviews with 25 upper secondary school teachers in the three schools mentioned above (A, B and C). In Sweden, the upper secondary school is organised into twelve national vocational programmes, six national higher education preparatory programmes and one introductory programme in preparation for one of the national programmes. The teachers who were observed and interviewed were from the Technology Programme (TP), the Natural Science Programme (NP) and the Electricity and Energy Programme (EEP). Most of the teachers taught in one of the three mentioned programmes, but some also taught in two or three of them and some in other programmes. The 25 interviews were semi-structured and focused on issues such as access to digital technologies, the current opportunities for and challenges of using such technologies in teaching, learning and administration, the teachers' professional development, support and infrastructure, as well as the future use of digital technology in school. All these issues are included in the Swedish 2017 national strategy for the digitalisation of the K-12 school system. The teachers were interviewed individually, with either one or two of the three researchers in the project present during the interview. The interviews lasted between 38 and 110 minutes, with an average of 60 minutes. All 25 interviews were recorded digitally, transcribed verbatim and then coded and thematically analysed (Creswell and Plano 2007) with the aid of NVivo11® software. In the first step of the analysis, the following 10 themes reflecting the teachers' views of their current digitised local school practices were constructed: (a) the infrastructure of and access to digital technologies at the school, (b) collegial learning and examples in the teaching teams of the good use of digital technologies, (c) examples of own use of digital technologies in teaching and learning, (d) continuous and professional development with regard to the use of digital technologies in teaching and learning, (e) the level of ICT support at the school, (f) possibilities with digital technologies in teaching and learning, (g) challenges with digital technologies in teaching and learning, (h) the use of digital technologies in administration and communication, (i) the future of digital technologies in school and (j) the most important things for students to learn in school and the role of digital technologies in that learning. The teaching practices of all 25 teachers were also observed. At School A, 21 lessons were observed for a total of 24 hours. At School B, 18 lessons were observed for a total of 21 hours and in School C 8 lessons were observed for a total of 12 hours. The observations focused on the everyday practices and activities in the classroom, with extra attention paid to issues related to digital technology, such as the infrastructure and the teachers' and students' use of the technology. The observations were documented as field notes. In a second step, the interview- and observational data from each school was analysed and used to construct a narrative case description (Boyatzis 1998). This main case description was then thematically organised into four sub-cases reflecting each one of the four sub-goals in the second focus area in the Swedish 2017 national strategy for the digitalisation of the K-12 school system accounted for above. In step four, these case descriptions were then analysed in relation to adequate digital competence as described on page 7 in the national strategy. More specifically, the case descriptions represent our understanding of the contextual preconditions and circumstances in which the teachers are expected to display and enact their digital competence as well as they can. Thus, in the fifth step of the analysis we applied this understanding to a reflective reasoning of what adequate digital competence might

mean and how it is enacted, based on the contextual circumstances emerging in the four narrative sub-case descriptions.

Discussion

In recent years the question of teachers' digital competence has been in focus in research, policy and practice. From the above, at least three different themes of teachers' digital competence can be identified in former research conducted in this field. These themes display challenges related to (a) defining digital competence in educational policy and practice.

In this article, four empirical sub-narrative case descriptions have been constructed, all of which are strongly aligned to teachers' enacted digital competence as described in the strategy's second focus area of equal access and use. When elaborating on what the term "adequate" might mean in practice, it is clear that teachers are expected to show and enact adequate digital competence in relation to at least (a) technological challenges, (b) technological-pedagogical challenges, (c) CPD and challenges related to time, identifying needs and networks and (d) technology-mediated communication and administration. The insights gained in the four descriptions are below assimilated into one possible understanding of what an adequate digitally competent teacher in the Swedish upper secondary school context accounted for in this article might be.

The empirical findings show that teachers with adequate digital competence can use a laptop and various digital learning resources in a good way. They are at ease with the functionality of different educational software and digital tools and know what kind of value digital technology will add to students' learning. They will also have the competence to anticipate possible challenges in students' use of digital technology and be able to negotiate established rules and routines with the students that reduce a non-educational use of the digital technology. As a consequence of limited economic resources, they will know which digital technology the school should buy and why, and how to search for free digital learning resources and programmes on the internet. Due to a centralised IT-support, they will have developed the competence to solve minor technological problems in the classroom and, if the problems cannot be solved, or if the internet is down, will be able to rapidly turn a digital mediated teaching plan into an analogue plan. In these Swedish school contexts teachers can also combine and enact technological and pedagogical competences in order to plan and organise subject-specific teaching- and learning activities. This includes the democratic aspect of organising learning activities that provide students with a rich use of digital technology as a preparation for their future lives as Swedish citizens. Even though the time in school for continuous professional development (CPD) is limited, the teachers can formulate their own needs for CPD, have solid networks and the competence to engage in informal collegial learning activities with teachers both within and outside their own school with the aim of learning how best to integrate digital technology in teaching and learning. Furthermore, they are creative in their administrative and communicative manoeuvres within and perhaps also beyond an LMS with several downsides with regard to functionality. They have the necessary competence to use the LMS for educational purposes, mostly as a digital repository for assignments. In addition, they can deal with the additional work of documentation and administration that digitalisation brings with it. Not least, they have the competence to balance aspects such as GDPR issues and ethical practices in the wake of an increased transparency and parents requesting digital access to school-related material in a way that has not happened before. Finally, due to the shortage of local policy documents with

strategies relating to the digitalisation of the school, they have the competence to navigate in an educational context without clear local guidelines and to contribute locally to the development of such policy documents and routines.

As this possible understanding of “adequate” in terms of digitally competent teachers covers a number of aspects it will be a real challenge for any one teacher to live up to them all with the excellence that is expected by policymakers and other stakeholders. In that sense, the above description may be more about an ideal teacher than a general teacher. Further, the designated competences are also expected to be displayed at different levels, depending on the level of competence that is needed in the local school context at any one time. Notably, it is in relation to the local contexts that the meaning of the term “adequate” becomes clear and operative.

Conclusion

Adequate digital competence in the Swedish upper secondary schools reported on in this article seems to be flexible in meaning, is determined by the local contextual conditions and is enacted in various activities, understandings and decisions based on the teachers’ own framework of values. If it is thought that a high level of adequate digital competence in school requires an exemplary digital school practice, it can be concluded that such a practice can at least be characterised by good technological infrastructure, teachers with a high level of technological-pedagogical knowledge, ongoing teacher CPD and a well-functioning technology-mediated communication and administration. However, at the same time, it can also be concluded that the elaborated understanding of “adequate” in this study does not always seem to clarify the formulations used in the national strategy for the digitalisation of the K-12 school system in Sweden. This also leads to the conclusion that different conditions in the schools, potential variations in meaning, agency and the enactment of adequate digital competence – in line with the our areas of digital competence as well as the new formulations in the revised Swedish curriculum for the upper-secondary school – can create unequal possibilities for students to develop an active citizenship in the (hyper) digitalised Swedish society of today and tomorrow that the policy seems to expect.

A variety of concepts are used to describe digitization in terms of investment, adoption, and use of newer technology in educational practices and educational research. These concepts include digital technology, information technology (IT), information and communication technology (ICT), and educational technology, to name a few. In general, these concepts are used interchangeably, as a clear distinction between them does not exist. As newer and more modern technologies are central to the scope and aim of this research, this section aims to provide an overview of a number of the variations of the concepts used by previous studies and authoritative reports Swedish authorities, i.e., the National Agency for Education, the School Inspectorate, publish a number of yearly reports addressing the status of digitalization in Swedish schools and national education. The concepts and acronyms used in these reports on digitalization varies between Information Technology, IT, and Information and Communication Technologies, ICT. In reports and websites published in Swedish, the word IT is often used. However, in one report, the distinction between the concepts can be clearly identified. The last digital agenda for Sweden distinguished the use of IT for the Swedish version (Näringsdepartementet, 2011a) and ICT for the English version (Näringsdepartementet, 2011b). As for the Swedish authorities’ websites, they use the concept of IT in Swedish while for the English webpage Introduction 8 the concept

of ICT is used. This can be seen in the webpages for, e.g., the Swedish National Agency for Education^{10, 11}, as well as the Swedish Digital Commission^{12,13}, which are responsible for analyzing progress in meeting the objectives of the Swedish IT policy. However, in a Swedish report published by the Swedish Digital Commission addressing the digital transformation of the society (Digitaliseringskommissionen, 2015), the concept of technology is used rather than the concept of IT. The use of IT and ICT interchangeably can be identified in scholarly work as well. For example, Grönlund (2014) uses IT and technology interchangeably in his report published in Swedish. Other scholars (e.g., Fleisher, 2013; Tallvid, 2014; Tallvid, 2015) used IT in Sweden, and ICT in English. In addition, the concept of digitalization and digital tools used to a large extent in Swedish published work, both authorities' reports and other publications, and scholarly works and publications (e.g. Digitaliseringskommissionen, 2015; Grönlund, 2014; Tallvid, 2015). In English publications by scholars outside Sweden, the acronyms and associated concepts used varies. In general, based on a limited number of publications, the most common concepts used are ICT (e.g., BESA¹⁴, 2015) and technology (e.g., Mishra & Koehler, 2006; Ertmer&Ottenbreit-Leftwich, 2010; Bates, 2015). ICT is defined as the utilization of IT and technology. However, in addition to IT and ICT concepts such as educational technology (Bates, 2015) are also used. Mishra and Koehler (2008) further make a distinction between advanced and standard technologies, referring to standard technologies as books, chalkboards, and blackboards, and advanced technologies as the Internet, digital video, operating systems, standard software, web browsers, email programs, and word processing programs. In agreement with Bates (2015), this research considers digitization to include all tools used to support teaching and learning considered to be, and referred to as technology, regardless of whether they are in the form of computers, software programs, or printed books. For this dissertation, the concept digital technologies will be used to refer to newer technologies used in the digitalization of the schools and into school teachers' everyday practices.

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