

# Surviving or thriving? Exploring school leaders' perception of initiated digital transformation

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## ABSTRACT

The global pandemic, COVID-19 shattered everyday life as we know it and disrupted education globally. In this study, we explore an initiated digital transformation accelerated by the pandemic from school leaders' perspectives in the context of Swedish high schools. The data consists of a questionnaire with 105 school leaders containing both fixed and open-ended response types. The results reveal significant differences in school leaders' views on how the transition has worked, whether they and their staff have developed their digital competence, and, how it will affect the school onwards. Contributions include theorising about school leaders' experiences of navigating an accelerated digital transformation prompted by the pandemic. We introduce four school leader profiles: (a) the enthusiast, (b) the affirmative (c) the skeptical, and (d) the hesitant. These profiles serve to encapsulate the nuanced perspectives of school leaders, thereby enriching our comprehension of their diverse requirements and priorities.

## KEYWORDS

School leadership; COVID-19; digital transformation; coping strategies; digital competence; school leader profiles

## 1. Introduction

The COVID-19 crisis changed the educational landscape, both immediately and in many ways (Weiner et al. 2021). Thus, school leaders faced the task of leading the transformation in a highly uncertain and ever-changing environment. As for now, the pandemic continues to raise questions about what will constitute the 'new normal' after the immediate threat has subsided (Yıldırım et al. 2021). As of today, there is a stream of research that addresses the digitalisation in education in the light of the pandemic from different stakeholders' perspectives including students (Loeb and Windsor 2020; Qvortrup 2021), parents (Alanko and Juutinen 2021; Dalland et al. 2021; Wallenius, Koivuhovi, and Vainikainen

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2021), teachers (Alerby, Ekberg, and Johansson 2021; Hartshorne et al. 2020; Olofsson, Lindberg, and Fransson 2021a) and school leaders' (Ahlström et al. 2020; Jones et al. 2021; Reid 2022). The research concerning school leadership during the pandemic is still emerging (Harris and Jones 2022). However, existing research emphasises how the demands on school leaders remain unpredictable and persistent (Harris and Jones 2022). Studies report that the pandemic has worsened school leaders' workload (Hauseman, Darazsi, and Kent 2020) with an increased level of stress and anxiety (Reid 2022) as well as a higher degree of burnout due to the demands associated with the pandemic (DeMatthews et al. 2021). Still, research also shows examples of school leaders who have adapted their practices in fruitful ways (e.g. Jones et al. 2021; Netolicky 2020) and it has been suggested that a new type of leadership has evolved during the pandemic, that is characterised by being "distributed and digital, and dependent on a technological infrastructure allowing regular engagement with all education stakeholders" (Harris and Jones, p.107). It has been suggested that the pandemic has further spurred leaders to accelerate the digital transformation of organisations (Hanelt et al. 2021). In this explorative study, we investigate an initiated digital transformation accelerated by the pandemic from school leaders' perspectives in the context of Swedish high schools. More specifically, our objective is to (1) explore and describe underlying factors of importance when studying school leaders' transition to distance education and (2) explore if there are any identifiable groups among the respondents with similar experiences, i.e. if there are different school leader profiles, and if so, what they are characterised by.

## 2. School leadership during COVID-19

The disruptive power of the pandemic and the centrality of the school leader in that situation make it an interesting object of study. As it is now, a stream of research is emerging that specifically examines school leadership during the pandemic, from different perspectives and contexts. For example, there is research that has focused on the effects of the pandemic on the work situation and well-being of school leaders. Reid (2022) explored how school leaders perceived stress and anxiety during the pandemic via interviews with public school leaders in the United States. The findings suggest an increased level of stress and anxiety since the pandemic and school leaders portray how they handled the situation by suppressing stress and anxiety as well as relying on activities and individuals outside of their school. Similarly, Sum (2022) explored four Australian school leaders' perceptions of the pandemic through focus group meetings. The study shows how the pandemic triggered a situation characterised by volatility, uncertainty, complexity, and ambiguity and made them reprioritize previous approaches to their work and well-being. Huber (2021) conducted a cross-national questionnaire with school leaders and highlighted the high

extent of stress reported. However, there is also research that explores the pandemic effect, on school leadership and possible gains owing to the pandemic. Harris and Jones (2020) argues that distributed leadership gained ground because of facing the multiple demands and unpredictable challenges of the pandemic. Additionally, Netolicky (2020) portrayed how school leaders became more adept and able to evolve. Jones et al. (2021) examined Norwegian school leaders' experiences via an online survey and focus group interviews. The authors conclude that the school leadership was characterised by being context-sensitive and reflexive. They suggest that the pandemic should be considered as an opportunity for leaders to cultivate their pre-existing skills rather than as an isolated incident that requires extraordinary leadership. Thus, it is of interest to explore school leaders' perceptions in a time of crisis as well as what kinds of implications it will have for leading practices and schools forward (Netolicky 2020). As for today, one scarcely researched area in school leadership during the pandemic and its connection to further digital transformation.

### 3. Digital transformation in education

Digital transformation is receiving great interest from both industry and academia. Hanelt et al. (2021) define digital transformation as 'organisational change triggered and shaped by the widespread diffusion of digital technology' (p.1187). Furthermore, Hanelt et al. (2021) stress that the phenomenon of digital transformation also 'seems to present an opportunity (and necessity) to advance the existing body of knowledge about organisational change' (p1160). Digital transformation constitutes a multifaceted process, where an organisation adopts digital technology to create new or modify existing, products, services, and operations (Vial 2019). It has been suggested that digital transformation is affecting (and challenging) managers across diverse organisations (Hanelt et al. 2021; Hinings, Gegenhuber, and Greenwood 2018; Vial 2019). The pandemic seems to further spur leaders into action by increasing their understanding of the need to accelerate digital transformation (Hanelt et al. 2021). Still, digital transformation could be considered an umbrella term that offers a point of departure from which diverse organisations and contexts can seek to define a more specific meaning. In an educational context, digital transformation has been described as a multi-dimensional process, spanning many different areas from infrastructure and administrative routines to pedagogical issues, competence development, and student learning (Lindqvist and Pettersson 2019; Vanderlinde and van Braak 2010). The introduction of digital technology includes both possibilities and risks that can both afford and constrain our possibilities of action. Digital technology in education has been described as an 'intellectual and social amplifier' that can help make good schools better but also increases problems at low-achievement schools (Islam and Grönlund 2016; Warschauer 2006). From that point of departure, digital transformation

does not only support (or in worse cases inhibit) educational work (Islam and Grönlund 2016). It changes the role of educational professions (Willermark 2018), the educational system (Olofsson et al. 2021 a), and the school as an organisation. In this study, we shed light on the role of the school leader, as a key actor for digital transformation within education. Previous studies point to the importance of active leadership (e.g. Dexter 2008; Islam and Grönlund 2016; Kafyulilo, Fisser, and Voogt 2016) along with clear vision and strategies for disseminating good techno-pedagogical innovations (Danielsen 2009; Islam and Grönlund 2016; Shapley et al. 2010). Additionally, the importance of promoting organisational development by allocating appropriate resources, providing suitable digital infrastructure and adequate technical support functions, as well as maintaining ambitious and high expectations and systematically following them up have been stressed (Dexter and Richardson 2020; Hatlevik and Arnseth 2012). Moreover, the importance of school leaders as 'role models' is identified in several studies (Cohen 2019; Håkansson Lindqvist 2019; Sergis, Sampson, and Giannakos 2018). Digital transformation in education is thus a complex and versatile task and school leaders' lack of digital competence has been suggested as the main barrier to digital transformation (Afshari et al. 2009; Dexter 2008; Petersen and Gorman 2014; Stuart, Mills, and Remus 2009). There have been many efforts to pinpoint the meaning of digital competence in an educational context (e.g. Hatlevik and Christophersen 2013; Howell 2012; Kivunja 2013; Krumsvik 2008; McDonagh et al. 2021; Mishra and Koehler 2006). Typical for the ideas is that they often stress that digital competence in education acts in complex organisational systems and thus denotes a more complex set of competencies compared to 'digital competencies' needed in other areas of society (Pettersson 2018). Thus, it requires more than basic technological skills, as it is about integrating them into an educational context. As suggested, digital transformation, both within and outside an educational context, constitutes a multifaceted process involving numerous interconnected aspects within an organisation. Consequently, this study does not cover all aspects that could be of interest in analysing a digital transformation process but focuses on a subset of aspects of an initiated digital transformation process induced by the pandemic and from school leaders' perspectives. More specifically it focuses on how school leaders perceive that they have been able to cope with the transition and its expected future consequences.

The literature on school leadership has long recognised the significance of context in the practice of school leaders (e.g. Harris and Jones 2020; Leithwood, Harris, and Hopkins 2020; Sum 2022). Sweden, like the other Nordic countries, is often referred to as world-leading when it comes to digital infrastructure. Thus, most students have access to the internet and equipment that enables distance education (Klette, Sigurdardottir, and Martin 2021). In Sweden, the digitalisation of education has been on the political agenda for decades with intensification in

recent years (Olofsson et al. 2021b). There is a national digitisation strategy with a stated objective of making Sweden world-leading in cultivating the opportunities of digitisation. Thus, the expectations for the digital transformation of the school are also visible at the policy level with ambitious goals. In a Swedish context, most school leaders (73%) state that they have the digital competence required to lead digitalisation. However, just over one in five believe that their digital competence in the area is low (Åkerfeldt 2023). As in many other contexts, Swedish school leaders are located at a crossroads of diverse tasks and responsibilities. They are expected to be accountable decision-makers and take responsibility for the economy, regulations, work environment, and personnel issues as well as monitor the quality of work and take action to curb any deficiency (Liljenberg and Andersson 2020). In the wake of the pandemic outbreak, the goal and mission remained constant, but the conditions for school leadership underwent an overnight transformation, with heightened demands for initiating a digital transformation process to modify existing operations (Vial 2019) i.e. to maintain education.

#### 4. Method

To explore the initiated digital transformation from school leaders' perspectives we used a mixed-method approach to gain a deeper and more comprehensive understanding of our research phenomena, by merging complementary perspectives (Creswell and Clark 2017). According to Morse and Niehaus (2009), this research design can be categorised as deductive and simultaneous. This approach prioritises statistical data analysis while also leveraging qualitative data to enhance the overall understanding of the subject matter. It enables identifying overall statistical trends and generalisations and provides insights into individuals' experiences, attitudes, and motives behind these trends (Creswell and Clark 2017).

##### 4.1. Data collection

The empirical data consists of a questionnaire addressed to school leaders' i.e. those responsible for the schools' pedagogical leadership, often referred to as the principal. The questionnaire contained both fixed and open-ended response types, capturing both quantitative and qualitative data. The initiative to evaluate the experiences of school leaders originally came from school organisers who wanted to understand more about the unique situation that school leaders faced with the sudden shift to distance education. Due to the abrupt and distinctive nature of the emerging situation, an exploratory methodology was employed and thus no established validated instruments were utilised. The questionnaire included a background question about within which school the school leader worked and 12 questions where the school leader

was asked to share their experiences from leading a virtual school. 8 of the 12 questions were formulated as fixed response types necessitating respondents to assess their experiences using a five-point Likert scale (refer to questions 1, 2, 5, 6, 7, 10, 11, and 12 in Appendix 1), accompanied by the opportunity to furnish additional comments in conjunction with their responses. Four questions were open-ended in nature (refer to questions 3, 4, 8, and 9 in Appendix 1). The questionnaire interface offered an opportunity for the respondents to review all the questions in their entirety and they were able to make modifications before final submission. The school leaders were contacted for participation in the study via their professional e-mails, and the questionnaire was available during May (weeks 20–22) of the year 2020. To recruit school leaders convenience sampling was used (Bryman 2015), which included Sweden’s largest educational organisation providing access to respondents. This meant that the school leaders represented both practical and theoretically-oriented schools and schools that were located in both cities and rural areas. The selection consisted of a total of 143 school units. The inclusion criteria specified that participants in the empirical study had to be currently serving as school leaders. The questionnaire was distributed via email to a total of 143 school leaders operating within Swedish high schools and received 105 answers, which means a response rate of 73%. Of the respondents, 34 school leaders represented theoretically oriented programmes, 31 practically oriented programmes and 40 represented a mix of theoretical and practical programmes.

#### 4.2. Data analysis

The data analysis contained statistical and qualitative analysis (see Figure 1). Initially, descriptive statistics and the free-text answers were reviewed. Thereafter correlation analyses, and factor analysis (based on principal component analysis and varimax rotation) were conducted in IBM/SPSS statistics version 27 to explore the relationships between different variables and to explore potential underlying factors based on the questions with fixed scales (se 1, 2, 5, 6, 7, 10, 11, and 12 in Appendix 1). The found factors were subsequently

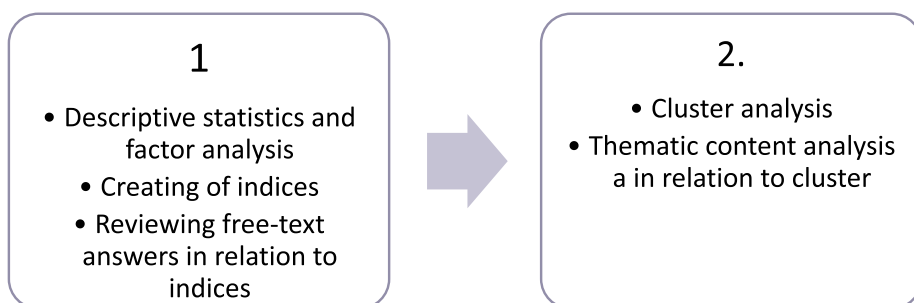


Figure 1. Illustration of data analysis.

used in a Two-step-cluster analysis. To our knowledge, there is no established rule regarding the required sample size for cluster analysis, even though some role of thumbs exists. For instance, it is suggested that the sample size should be not less than  $2^k$  or preferably  $5 \cdot 2^k$ , where  $k$  is the number of clustering variables (Dolnicar 2002). Thus, with three clustering variables at least  $5 \cdot 2^3 = 40$  cases would be preferable. Another more recent suggestion is that the minimum required sample size is  $10 \cdot k$ , e.g.  $10 \cdot 3 = 30$  (Qiu and Joe 2009). Our sample size of 105 respondents exceeds these suggested required levels. Next, the qualitative data were analysed, as the descriptive nature of qualitative approaches allows the researcher to build a complex, holistic picture of a phenomenon (Castleberry and Nolen 2018), in this case, an initiated digital transformation accelerated by the pandemic.

The open-ended questions and the free-text comments to the fixed questions were analysed in a qualitative manner, in relation to the statistically deduced clusters, to understand the clusters beyond the statistics used. We used a thematic analysis which has been described as a method for identifying, analysing, and reporting patterns (Braun and Clarke 2006). Broadly speaking, the process of analysing qualitative data can be summarised into five fundamental steps: compiling, disassembling, reassembling, interpreting, and concluding (Yin 2011). *Compiling* constituted the first step towards uncovering meaningful insights and addressing the research questions to compile the data into a usable form. Thus, we arranged the data from the open-ended responses based on the cluster analysis. In practical terms, the data was inserted into the MAXQDA software programme developed to support qualitative and mixed methods research. The tool was chosen to support systematically organising the data based on cluster. *Disassembling* involved creating meaningful groupings through coding where similarities and differences in the data were identified. The coding was made through an inductive approach where excerpts were arranged and rearranged into evolving categories, describing for example 'opportunities', 'challenges', 'organisational methods' etc. The categorisation of the free-text answers is illustrated in Figure 2. In total, 314 excerpts were categorised.

*Reassembling*, we proceeded to identify and create themes by discerning patterns in the codes. In this phase, our investigation focused on determining the

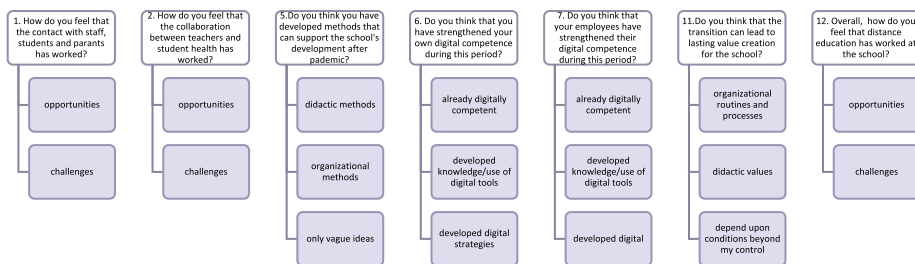


Figure 2. Categorization of the free-text response in relation to index.

distinguishing characteristics of each school leader profile and identifying the concepts that captured their respective experiences of sudden digital transformation, such as skepticism or enthusiasm. *Interpretation* involved writing detailed descriptions of the clusters based on the patterns identified across the coded data. It included a generalisation of, and a reduction to, the most important characteristics and driving forces of different clusters. For example, what do the challenges related to school leaders' contact with students and parents consist of or what kind of organisational routines and processes will last? In this way, narratives are given to the statistical analysis, where school leaders' experiences, actions, and motives are given a voice. To bring out the essence of the most important characteristics of each of the four clusters, the analysis focused on similarities and differences between the different clusters based on the free-text responses. The analysis identified and mapped concrete examples of how the transition affected school leaders' everyday lives as well as their affection i.e. how they experienced the situation emotionally and what concrete measures have been identified considering the pandemic. The purpose of the analysis was to create a narrative that reflects a reduction of the most important characteristics of each of the clusters. *Concluding* is the final step, which involves writing down answers to the purpose of the study and allows readers to assess how findings can be transferred and applied to their area of practice (Yin 2011).

## 5. Results and analysis

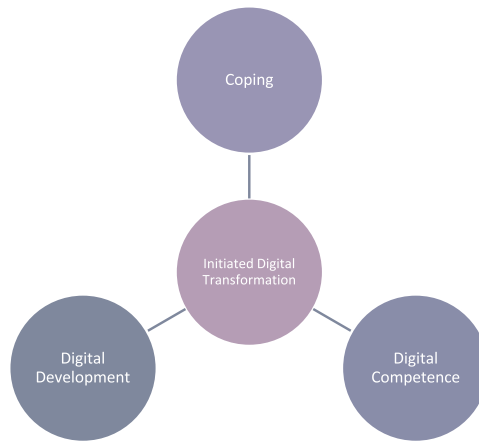
We introduce by describing underlying factors of importance when studying school leaders' sudden transition to distance education. Thereafter we present four school leader profiles and their characteristics.

### 5.1. Underlying factors

Three underlying dimensions were identified (see Appendix 2) as important for studying school leaders' transition to distance education and that capture (1) how school leaders perceived coping with the transition (3 items, Cronbach's alpha = 0.71), (2) school leaders and teachers' development of digital competence (2 items, Cronbach's alpha = 0.71, Spearman-Brown = 0.72) and (3) the degree of digital development (2 items, Cronbach's alpha = 0.61), (see Figure 3 and Tables 1–3). The items used in the indices were all measured on a five-point scale, and the indices were calculated as the mean of the included items.

### 5.2. School leader profiles

The analysis, performed in an explorative manner, showed a similar fit to either three or four clusters. The qualitative analyses and thematisation were put into



**Figure 3.** Exploring initiated digital transformation via three indexes.

the suggested statistical clusters. We found that four clusters gave a more homogenous description within each cluster and stronger sense-making than compared to using three clusters. Thus, the mixture of the statistically deduced suggestions and the themes deduced in the qualitative analyses resulted in four clusters. The four school leader profiles were assigned names that encapsulated the essence of their experiences of an initiated digital transformation accelerated by the pandemic: (a) the enthusiast, (b) the affirmative (c) the skeptical, and (d) the hesitant. **Figure 4** shows the distribution for each school leader profile.

**The enthusiasts' school leader profile** is characterised by a general perception that coping worked well, with the high development of digital competence, and a high degree of digital development. The transition has worked very well, and the school has been capable of quickly coping with the rapid transition. One school leader uses the expression of a *'Friction-free transition'* (R63) to describe the process. The students have been active in class, and some even seem to appreciate the variety in their teaching. Some students previously showed low attendance has increased their presence and activity in teaching, as illustrated by; *'We have observed that students who previously encountered difficulties attending school for various reasons have shown improved presence and increased*

**Table 1.** Distribution of answers per question for Index 1. N = 105.

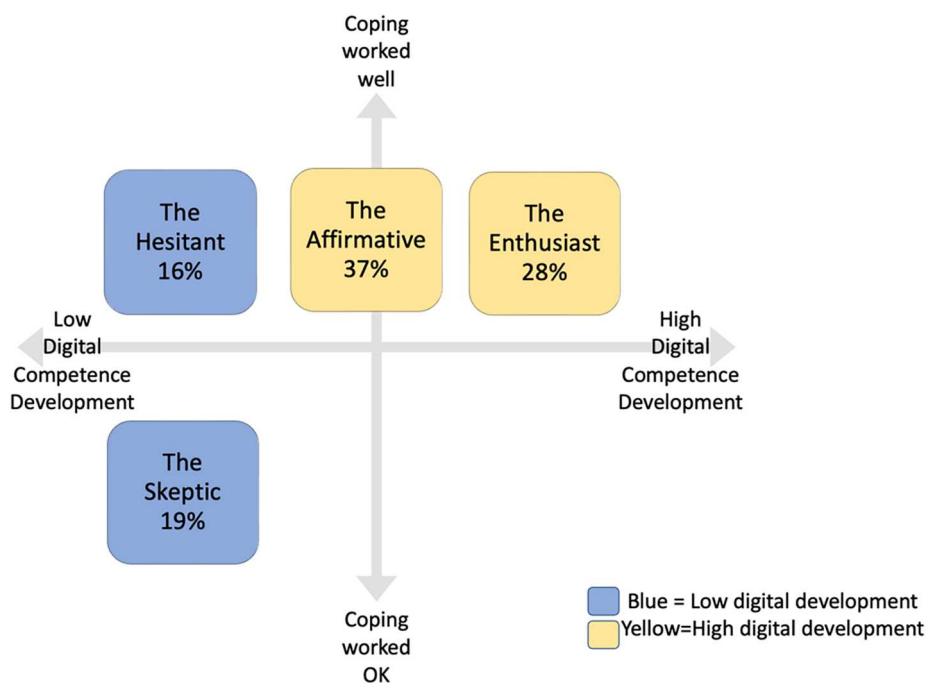
Coping	Scale					Total
	Very well	Pretty well	OK	Pretty bad	Very bad	
1. How do you perceive that the contact with staff, students, and guardians has worked?	28%	54%	13%	5%	—	100%
2. How do you perceive that the collaboration between teachers and student health has worked?	39,6%	39.6%	16%	4.8%	—	100%
12. Overall, how do you perceive that distance education has worked at the school?	38,7%	50%	10,4%	0,9%	—	100%

**Table 2.** Distribution of answers per question for Index 2. N = 105.

	Scale					Total
	To a very large extent	To a large extent	To some extent	To little extent	To no extent	
Digital competence						
6. Do you think that you have strengthened your own digital competence during this period?	16%	30,2%	39,7%	11,3%	2,8%	100%
7. Do you think that your employees have strengthened their digital competence during this period?	39,6%	36.8%	21,7%	1,9%	—	100%

**Table 3.** Distribution of answers per question for Index 3. N = 105.

	Scale					Total
	To a very large extent	To a large extent	To some extent	To little extent	To no extent	
Digital development						
5. Do you think you have developed methods that can support the school's development after pandemic?	34.9%	46,2%	17%	1,9%	—	100%
11. Do you think that the transition can lead to lasting value creation for the school?	20,8%	31%	41%	5%	2,2%	100%

**Figure 4.** Illustration of the school leader profiles and the distribution of the data within each category (N = 105).

*participation in class activities'* (R4). The employees have helped each other in all kinds of ways. Overall, the contact with staff, students, and guardians has proven to be effective as well as the collaboration between teachers and

school health service. The school has not only stuck to established routines but developed them. It includes procedures to quickly identify students who deviate from school and to take immediate action, as illustrated by; *'It works almost better than before, as we have created a document that allows the student health service to quickly receive information about students who are not doing well and may, for instance, need a contact'* (R99). The school leader's digital competence has been developed. It includes learning new digital tools but also new approaches for communicating with employees and students as well as making auscultations of teaching in the virtual classroom, as illustrated by; *'I have been able to conduct extra 'classroom visits' via Google Classroom than I usually manage in the physical classrooms* (R82). The employees have also developed their digital competence, both in terms of using digital platforms and new tools as well as finding new techno-didactic forms of teaching and collaboration as illustrated by; *'It opens new opportunities for working in new ways and in a more collegial manner'* (R53). The experiences from the pandemic will have consequences for the digital development of the school, both immediately and in the long run. For the school as an organisation, it means increased flexibility, for example by applying digital meetings and offering hybrid or distance education in case of mild or moderate illness among teachers or students. If the regulation were to permit, the school leader would use opportunities to apply remote teaching regularly. In this way, schools could collaborate and offer an increased number of courses for students.

**The affirmative school leader profile** is characterised by a perception that coping worked well, and that there was a moderate development of digital competence and a high degree of digitalisation. Given the fact that the transition to a virtual school happened overnight, it must be considered a success. Both students and parents are very satisfied with how the school has handled the transition as evidenced by the frequent personal communication between the school leader and students/parents, as illustrated by; *'We receive many joyful emails from parents who are grateful for the excellent arrangements we provide for the students and for the quality of information'* (R44). Still, the conditions for teachers differ greatly. It is generally more difficult to teach practically oriented subjects where the pedagogy is often dependent on professional tools and the teachers' ability to show, point, and instruct on-site. Communication at school has been affected in diverse ways. On the one hand, communication has worked well, in some cases better than usual, with strong routines and simple contact routes. On the other hand, communication has worked worse than usual as the spontaneous and informal coffee catchups, and corridor chats with colleagues, have disappeared, as illustrated by; *'We lack the social bond that only occurs at [the physical] school'* (R37). The school was already digitalised in numerous ways before the pandemic. The students had their tablets, relied on the school learning management system, and were familiar with digital teaching aids. The school leaders' digital competence was decent before the

pandemic, but it gave reasons to find some new software, applications, and approaches. The same applies to the employees. Most of them were digitally competent in a broad sense, but the transition probably forced many to let go of prestige, i.e. to dare to try something new, as illustrated by; *'A vast majority already had a strong foundation but the transition forced them to let go of perfectionism, meaning they dared to try even if it didn't turn out perfectly from the start'* (R40). The pandemic will affect the schools onwards. It includes how meetings and lectures are carried out. 'On-site' should no longer be considered the only option. Both online and hybrid participation shall be applied to facilitate participation. The experiences from the pandemic stress the importance of transparency both for students and colleagues. Through simple technical solutions, teachers should be able to follow and share course plans and teaching material.

**The skeptics' school leader profile** is characterised by a perception that coping worked OK, with low development of digital competence, and a low degree of digital development. Overall, the skeptical experience that the school has maintained teaching during the pandemic, but it has been beyond challenging. The school has missions that go beyond teaching which becomes difficult to achieve in the virtual context, as illustrated by: *'Nurturing democratic citizens, addressing diversity, and building a long-term sustainable society have become considerably more challenging [at distance]// we prioritise almost exclusively the knowledge mission'* (R7). Besides, the quality of the teaching activities is worse, and it is hard to help students with difficulties to maintain study discipline. Support and adjustments to the individual student are often based on good relationships with adults, which are difficult to build or maintain at a distance. Additionally, students show depression-like symptoms, and teachers seem to suffer from a lack of motivation in the virtual setting, as illustrated by; *'Teachers, as a collective, have been significantly affected by a pronounced lack of motivation. Several are explicit in stating that they would not work as teachers if distance education were a permanent or long-term solution'* (R12). The contact between employees works OK, or even well at times, but it is worse with students. Some students do not show up to class nor respond to the school's outreach activities, via phone calls, text messages, and emails. It's frustrating and time-consuming. The school leader feels that the student health service is fumbling and has difficulty finding its role in the new setting, as illustrated by; *'The student health services are struggling in their mission and finding it challenging to adapt. There are many questions surrounding issues like confidentiality, for example'* (R67). Neither the school leader nor the staff has developed their digital competence to any greater degree. In many ways, they were already digitally competent. What implications the pandemic will have in the future is still unclear. The school leader believes that the school as an organisation needs plenty of time to contemplate what they have been through and what to preserve in the future. Now it is time for reflection and evaluation rather than innovation.

**The hesitant school leader profile** is characterised by the perception that coping worked well, with low development of digital competence, and low development of digital development. Altogether, the hesitant belief that the school has done a good job. The school leader trusts that the students will do well after the pandemic because the employees have worked very hard to make everyday work, work, as illustrated by; *'We are doing a good job, exerting substantial effort in our endeavours, and our students will excel as a result of our commitment to our work'* (R61). Mapping how the students cope with studying from home and actively seeking contact both with students and parents has been a prioritised task. It has involved the teachers as well as the school leader and student health service. The student health service has been given the assignment to observe teaching during the pandemic to map the conversations, lesson structure, and work environment in the virtual classroom to support teachers. Nevertheless, the school leader is giving considerable thought to the long-term impact of the pandemic on the dynamics among employees and between employees and students. The pandemic has brought far-reaching changes in the educational system that are likely to have consequences on educational practices over a long period. The digital competence among the school leaders and the employees has not been developed to any larger extent, as illustrated by; *'We managed the rapid transition due to a high level of digital competency not only within our school but also across the entire organisation'* (R18). Perhaps, there are a few teachers, who previously bypassed the school's learning management system or digital teaching aids that have now been 'forced' into digital systems. However, they constitute an exception. Instead, this period has been characterised by the competencies of handling stress, being flexible, and navigating one's profession in an uncertain time. The experiences from the pandemic could be used in the digital development of the school onwards, however, what it means more precisely, time will tell.

In summary, different images and experiences emerge from the school leaders' encounters with an initiated digital transformation accelerated by the pandemic, which sheds light on opportunities as well as identifies problems.

## 6. Discussion

Many school leaders perceive that the transition to running a virtual school has gone well and beyond their expectations. In a time of crisis, many school leaders testify that the employees adapted to the situation that arose and came together to deal with the consequences. That there was such a widespread acceptance of the *immediate* and *transformative* changes must be seen in the light of a crisis. Besides, the results should also be understood on the basis that the digital transformation of Swedish schools has been on the political agenda for a long time (Olofsson et al. 2021b). Thus, for schools that already apply one-to-one, have an established digital infrastructure, and rely on

digital technology for teaching, communication, and administration, the transition to a virtual school will be less disruptive. Such circumstances can explain the school leaders' widespread experiences of a relatively effective and successfully initiated digital transformation. At the same time, the pandemic also reveals organisational difficulties and problems. In an educational context, digital transformation has been described as a multi-dimensional process, spanning many different areas from infrastructure and administrative routines to pedagogical issues, competence development, and student learning (Lindqvist and Pettersson 2019; Vanderlinde and van Braak 2010). This means that many aspects must be aligned to achieve fruitful digital transformation. Previous research shows that there is an inequality regarding access to, and use of technology between schools (Willermark and Pareto 2020), and that digital competence within educational contexts denotes a more multifaceted set of competencies (Pettersson 2018). Besides, previous studies suggest that practical subjects have faced greater challenges than theoretical subjects since it can be more challenging to practice practical elements in a virtual setting (Carlsson et al. 2022). Such contextual working conditions (e.g. Harris and Jones 2020; Leithwood, Harris, and Hopkins 2020; Sum 2022) can explain differences among school leader profiles.

In this study, relying on digital solutions became a prerequisite for maintaining education, as teaching in brick-and-mortar schools was no longer an option. Thus, it involved an initiated digital transformation accelerated by the pandemic, where organisational changes were triggered and shaped by the widespread diffusion of digital technology. It has been argued that digital transformation has been challenging managers across organisations, occupations, and contexts for quite some time (Hanelt et al. 2021). It is therefore particularly interesting to consider how the post-pandemic era is viewed from the perspective of school leaders. That is, what opportunities and risks do they identify and how do they view digital transformation in the aftermath of the pandemic? As for the profiles 'enthusiast' and 'the affirmative,' there is some concrete 'before' and 'after' the pandemic in terms of the school's organisation and the experience of the pandemic provided the opportunity for the schools to 'thrive' rather than just 'survive'. It is in line with Harris and Jones (2022) who see a new type of leadership after the pandemic, characterised by being distributed and digital. Here, the effects of the pandemic are concrete and long-term. As for the affirmative profile, scenarios are identified that are (at least not yet) possible based on regulation. Opportunities are perceived in applying distance education as part of a strategic effort to curb problems with recruiting competent teachers or increasing the range of courses offered to students through collaboration between schools. Similarly, the affirmative profile questions things that were previously taken for granted regarding, for example, meeting culture. Furthermore, the affirmative profile expresses opportunities with technical solutions for

coordination, organisation, and increased transparency, in work practices. It may include simple technical solutions regarding authorisation in the learning management system or how to share information between, for example, teachers and student health services. For 'the skeptical' and 'the hesitant' profile the implications of the pandemic are vague. However, they emphasise the importance of reflection and evaluation rather than innovation and implementation. Thus, they still seek to define a more specific meaning of what digital transformation will mean for them (Hanelt et al. 2021). The school leader profiles can serve as a valuable instrument for enhancing our comprehension of digital transformation in an educational context. These profiles provide diverse perspectives and facets for thorough exploration and analysis, aiding us in the identification of critical success factors, challenges, and opportunities within a digital transformation process.

### **6.1. Limitations future directions**

This study has limitations that should be noted and that also can serve as areas for future research. The study is exploratory in nature and thus does not rely on any established validated survey instruments. Furthermore, the study builds on a limited, non-representative sample, limiting the generalizability of the study's conclusions as it pertains to the failure to incorporate background variables such as demographic characteristics, and socioeconomic status, into the analysis. Furthermore, digital transformation could also be advantageously examined by including more aspects that reflect additional dimensions of such a process. Also, this study explores school leaders' experience of an initiated digital transformation accelerated by the pandemic at one point about three months in. It provides a snapshot of school leader experiences and does not follow possible changes over time nor have knowledge of the long-term effects. Future studies should endeavour to collect and analyse data on relevant background variables and employ a more comprehensive approach to digital transformation. Notwithstanding these constraints, we argue that the study also poses noteworthy strengths by not only presenting the statistical outcomes of the sample but also by elucidating how respondents cluster and capture their experiences in the respondents' own words. The study succeeded in generating a theory based on their results, also referred to as 'analytical generalization' (Yin 2009). Consequently, it is not statistical criteria but the explanatory power of theoretical reasoning that becomes relevant when assessing the results. The position of this paper is that the results from this study have broader theoretical implications than to explain this specific study, as it illustrates different school leader profiles by shedding light on opposing experiences in a variety of dimensions when school leaders are facing a radical case of an initiated digital transformation accelerated by the pandemic.

## 7. Conclusion and implications

This paper contributes to the area of school leadership and digital transformation within education. We present four school leader profiles: (a) the enthusiast, (b) the affirmative (c) the skeptical, and (d) the hesitant, which capture the essence of their multifaceted perceptions of facing an initiated digital transformation process. It adds nuance to the common description of the pandemic as a time marked by a tumultuous and chaotic transition. Furthermore, it sheds light on opportunities and risks that may arise when initiating a digital transformation process in an educational context and illustrates the necessity for knowledge sharing and collegial learning to reap the benefits of digital transformation. The- orising school leaders' encounters with digitisation are of value also in the post-pandemic era. Thus, regardless of the pandemic, the digitisation in schools intensifies, which concerns school leaders in many ways. The result is of relevance to consider for those striving to advance digital transformation in schools, and who are required to support school leaders in their work and professional development, such as school organisers and school leadership training.

### Disclosure statement

No potential conflict of interest was reported by the author(s).

### Data availability

The corresponding author can be reached for reasonable requests for the datasets.

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## Appendices

### Appendix 1. Overview of the questionnaire

1. How do you perceive that the contact with staff, students, and parents has worked?\*

- Very well
- Pretty well
- OK
- Pretty bad
- Very bad

Comment:

2. How do you perceive that the collaboration between teachers and student health has worked? \*

- Very well
- Pretty well
- OK
- Pretty bad
- Very bad

Comment:

3. What do you perceive has worked the best since you switched to distance education? Describe in your own words:

4. What do you perceive has been the most difficult since you switched to distance education? Describe in your own words:

5. Do you think you have developed methods that can support the school's development after the pandemic? \*

- To a very large extent
- To a large extent
- To some extent
- To little extent
- To no extent

Comment:

6. Do you think that you have strengthened your own digital competence during this period? \*

- To a very large extent
- To a large extent
- To some extent
- To little extent
- To no extent

Comment:

7. Do you think that your employees have strengthened their digital competence during this period? \*

- To a very large extent
- To a large extent
- To some extent
- To little extent
- To no extent

Comment:

8. How do you perceive that the transition to distance education has affected your leadership? Describe in your own words:

9. How do you perceive that the transition to distance education has affected your organisation and your long-term work? Describe in your own words:

10. Do you assess that the transition to distance education has affected your students' conditions for achieving their educational goals?

- To a very large extent
- To a large extent
- To some extent
- To little extent
- To no extent

Comment:

1. 11. Do you think that the transition can lead to lasting value creation for the school?\*

- To a very large extent
- To a large extent
- To some extent
- To little extent
- To no extent

Comment:

12. Overall, how do you perceive that distance education has worked at the school?\*

- Very well
- Pretty well
- OK
- Pretty bad
- Very bad

Comment:

\* The questions that were included in the final analysis of school leader profiles are marked with \*

### Appendix 2. Factor analysis

Based on the screen plot and variance explained, the suggested model is based on three factors, with the following loadings (values below 0.4 not shown) in the rotated matrix.

	Component		
	1	2	3
2) How do you feel that the collaboration between teachers and student health has worked?	,810		
1). How do you feel that the contact with staff, students and guardians has worked?	,719		
12) In summary, how do you feel that distance education has worked at the school?	,683	,479	
11). Do you think that the transition can lead to lasting value creation for the school?		,841	
5) Do you think you have developed methods that can support the school's development after the pandemic?		,721	
6). Do you think that you have strengthened your own digital skills competence this period?			,886
7) Do you think that your employees have strengthened their digital competence during this period?			,820