

Pandemic as Digital Change Accelerator: Sustainable Reshaping of Adult Education Post Covid-19

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Abstract

This multi-case study examines the educational change in municipal adult education (MAEd), during and directly after the Covid-19 pandemic. Applying Fullan's educational change perspective, we analyze teachers' professional development in terms of evolving materials, changing pedagogies, and altered beliefs about teaching and learning. Data were collected in 2020-2022 from questionnaires, interviews, and question-answer sessions with MAEd teachers (n=140) from the three largest cities in Sweden. The findings demonstrate a pronounced exploration of disparate learning theories, growing recognition of online and hybrid modes of education delivery, remediation of materials, and raised attention to teaching quality and design with clarity and structure. Besides signs of professional development, the study provides empirical evidence for institutional adaptation to respond to crisis, learn from experiences, and emerge prepared for future challenges. Conclusively, the study findings indicate that sustainable reshaping of MAEd requires proactive and strategic leadership that aligns with policy and national directives and grassroots initiatives.

Keywords: Online education, lifelong learning, adult education, teacher professional development, educational change

1. Introduction

Our collective experiences during the Covid-19 crisis highlight the role of digital technology as an enabler of education to continue despite the physical lockdowns and social distancing, imposed all over the world (Papadopoulos, 2022). The term 'Digital Change Accelerator' in this paper refers to the rapid transformation and modernization of adult education through digital means, particularly in response to the challenges posed by the Covid-19 pandemic. The abrupt transition to online teaching in March 2020 brought about significant changes in teaching practice, acknowledged in research as 'emergency remote teaching' (Hodges & Fowler, 2020). In Sweden, though

the governmental inspection reports concluded that, considering the circumstances, online education met the needs of learners, some learner groups, such as immigrants, learners with special needs, and students in vocational training were found struggling with their studies (The Swedish Schools Inspectorate, 2021). As future lifelong learning goals cannot be achieved sustainably with a 'one-size-fits-all approach,' it is pivotal to consider how the needs of different learner groups can be met in online education. That is, to remain relevant and to respond more effectively to the rapid and abrupt changes in society, schools must be seen as 'complex adaptive systems' capable of self-organization and regular adjustment (Cleveland, 2018, p. 61).

Digital technologies have long been expected to be meaningfully integrated into educational practices by teachers (Redecker & Punie, 2017). Several EU countries have also redesigned their curricula (Eurydice, 2019), including Sweden, which implemented a national digitalization strategy for education (Government Offices of Sweden, 2017). Emergent transformations in learning environments were sparked by the Covid-19 pandemic (Carvalho et al., 2021; Hodges & Fowler, 2020), and technology-driven disruption further accelerated the development of teaching and learning practices, offering a unique opportunity to reshape education (Liguori & Winkler, 2020). Due to this, the current situation is challenging in two ways: successfully managing a large-scale digital transformation of educational context (Vial, 2019) as well as reshaping teaching practices and educational delivery in a way that fits into the vision of a lifelong learning for diverse learner groups (Belzer et al., 2022). Before the pandemic, despite evidence of technology's benefits in enhancing adult education and promoting personalized learning (Rosin et al., 2017) and recognizing the link between literacy and digital problem-solving (OECD, 2015), many adult education programs faced challenges in adopting remote teaching through digital means (Belzer et al., 2022). During the pandemic, many adult educators lacked prior experience and training in teaching in distance education (Belzer et

al., 2022), which made institutions put efforts and resources in assisting them with digital competence development (The Swedish Schools Inspectorate, 2021). Though the impact of the abrupt transition, due to the pandemic situation, from in-person instruction to immediate online activities has been significant and global on adult education (Housel, 2021), few studies analyzed the teachers' experiences of this transition. To this end, this study aims to explore the significance of this educational change in the context of municipal adult education (MAEd) in Sweden and how the teachers responded to this emergence of new online practices and spaces. Applying Fullan's (2007) educational change and professional development perspective, we raise the following research questions, addressing three central dimensions in the experiences gained from the pandemic - use of new materials, development of new pedagogies, and altered beliefs about teaching and learning:

1. How do MAEd teachers talk about their competence in using digital resources for teaching during and after the pandemic?
2. Which new pedagogical strategies do MAEd teachers report applying in relation to online teaching?
3. What revised beliefs do MAEd teachers hold about teaching and learning?

2. Previous research

2.1. Emergent modes of educational delivery

Reconceptualization of the learning space (Hilli et al., 2019) and modifications to the educational ecosystem (Pischetola, 2022) are currently being discussed in research due to "the large-scale, wide-spread planning, development and delivery of alternative learning environments" during the pandemic (Nørgård, 2021, p.1711). Courses delivered through distance education have traditionally been asynchronous, with delayed and text-based interactions and no real-time communication (Johnson, 2006). As technologies have advanced, distance courses have begun incorporating synchronous elements that facilitate real-time interaction and communication (Bernard et al., 2009). Combining synchronous and asynchronous modes has become increasingly common (Watts, 2016), also in adult education (Danchikov et al., 2021; Bergdahl et al., 2022), and can be the first step toward a large-scale blend of practices (Leijon & Juni, 2021). However, we must consider the pedagogical impact versus the allure of technological novelty. As any combination of modes of educational delivery (on-site, synchronous, asynchronous) can be referred to as a

hybrid mode, hybrid learning may be included in such development (Raes, 2022; Nørgård, 2021). This is aligned with discussions on the dissolution of the dichotomy between digital and non-digital and the polarization between online and face-to-face modes of delivery (Nørgård, 2021; Goodyear, 2022). As society becomes more digitally oriented, Nieveen and Plomp (2018) suggest that the boundaries between schools and the outside world must disintegrate, with learners spending less time in physical classrooms and education becoming more personalized. Based on Fullan's (2007) argument, educational reform must address the changing needs of students, society, and workplace. Furthermore, Papadopoulos (2022) contends that top-down education conflicts with teachers' professional and pedagogical values. Giovannella et al. (2021) investigated the attitudes and beliefs of teachers regarding online schooling. They found a connection between teachers' beliefs in the future of online education, their high levels of digital competence, and their positive attitudes toward utilizing digital technology. However, the effectiveness of asynchronous and synchronous learning differs. Several studies suggest that synchronous groups outperform asynchronous ones (Lotfi & Pozveh, 2019); other research claims that students' achievement depends primarily on the time spent on learning (Nieuwoudt, 2020). This inconsistency in findings suggests that effectiveness might be context-dependent, calling for more nuanced studies. It appears, however, that both modes are gaining popularity (Amiti, 2020). While popularity is noteworthy, the feasibility of implementation represents a distinct challenge. Differences in allocation and access to digital resources may create inequalities which are closely connected to teaching challenges and concerns about widening digital divide (Forsling, 2019). A fundamental component of this is the digital infrastructure, access, usability, and quality that is provided (Bergdahl et al., 2022). It raises the need for an integrated approach, digital infrastructure not being an afterthought but a central element of educational planning.

2.2. Distance learning in MAEd

The number of distance learning opportunities in adult education was less prevalent prior to the pandemic (Belzer et al., 2022). Even though distance learning was offered, on-site education was the preferred method for immigrants wishing to complete vocational training or to acquire a second language (The National Agency for Education, 2021). It is common for these educational institutions to be underfunded, and many students are lacking the necessary study skills to succeed. According to research, it is necessary to consider not only

individual teacher factors, such as attitudes, years of experience teaching online, and delivery modes (asynchronous, hybrid, face-to-face), but also the broader context of the institution, culture, and innovation (Scherer et al., 2021). In addition, adult learners are often burdened by responsibilities that might interfere with their learning process (e.g., family duties, work obligations) and require additional motivation to persist in their studies (Hung, 2016). In Sweden, the provision of lifelong learning, such as the programs offered through MAEd, should prioritize flexibility and continuity to accommodate the diverse needs and circumstances of every learner (Swedish Parliament, 2010). This involves providing (adult) education in a range of modes, such as on-site learning with extensive teacher assistance or online options, to allow individuals to effectively manage their studies alongside their work or other obligations. Because of the necessity for flexibility, the Swedish MAEd program distinguishes itself from primary and secondary education where online teaching methods are largely prohibited by law.

By integrating new digital technology into education, new opportunities for communication, meaning making, and learning arise. There is potential to provide more varied, collaborative, and individualized learning based on recipients' actual goals and needs (Harper & Milman, 2016). Scaffolding can be more easily accomplished as teachers can refer their students to more challenging and multimodal interactive materials online. The materials are often multimodal such as films, animations, slide shows, quizzes, sound recordings, or interactive games. Learners can collaborate and co-construct by using network technology, engaging in joint activities, sharing resources, and collaborating (Jeong & Hmelo-Silver, 2016) which are seen as key success factors for learning (Binkley et al., 2012).

While the use of digital technology in adult education can enhance instruction and personalize learning (Rosin et al., 2017), there are substantial challenges associated with reshaping lifelong learning through MAEd. For example:

Disruption to in-person learning: the closure of educational institutions during the pandemic made it difficult for adults to access educational opportunities in their usual on-site in-person learning, resulting in a swift shift towards online education and work from home (Lopes & McKay, 2020). Online education was not well understood or trained by teachers, and many of the teaching strategies developed from 'zero-night' survival actions (Carugati et al., 2020) resulting in an increased workload for teachers (Hodges & Fowler, 2020).

Social-emotional well-being and mental health: due to stress and uncertainty caused by the pandemic,

which negatively impacted mental health and well-being, learners were unable to focus on learning. Additionally, losing access to community resources and experiencing limited interaction with teachers (Käpplinger & Lichte, 2020; Santos, 2020) resulted in lower levels of engagement and motivation (Aldridge et al., 2020).

Access to online resources and digital competence: most students and teachers found it difficult to learn and teach remotely. Some students were "on the wrong side of the digital divide" by using their private mobile phones (Belzer et al., 2022, p. 83). They also lacked access to high-quality digital resources and the Internet, as well as having low levels of digital competence (Aldridge et al., 2020; Garcia et al., 2021). Students with lower literacy levels who usually struggle with digital problem-solving tasks (OECD, 2015) had problems with understanding online instructions (Belzer et al., 2022). It was also reported that there were technical difficulties with online tools as well as limited access to software and digital infrastructure (Bergdahl et al., 2022).

Leadership and financial barriers to learning: adult learners encountered challenges in accessing educational resources or enrolling in courses due to financial constraints (Santos, 2020). To steer education during unstable periods, several researchers suggest that crisis management and a revised psychology of leadership are essential (Haslam et al., 2021).

Despite the above challenges, ongoing changes created opportunities for emerging modes of teaching and learning (Di Pietro & Karpiński, 2021). Research also underlines the importance of addressing inequalities in access to learning and the need for more flexible and adaptable approaches to adult learning (Housel, 2021), such as the need for older adults to be able to access and use digital technologies (Boeren et al., 2020; Garcia et al., 2021) and to learn at their own pace (Abdrahim, 2020; Blicek et al., 2019).

2.3. Theory of change in educational practice

This study is grounded in the theory of educational change and professional development, developed by Fullan (2007), that identifies three dimensions of teaching and learning processes that influence and increase the complexity of change in classroom practices:

- use of *new materials*: selecting and implementing appropriate educational resources,
- development of *new pedagogies*: exploring teaching strategies or activities for achieving educational goals, and

- *altering beliefs*: teachers talking about what constitutes good education and its delivery.

To attain the desired educational goals, all three dimensions must be considered as they interact with one another. It may be necessary for teachers, for example, to adopt new approaches for instruction, such as allowing students more autonomy, and to incorporate updated materials, such as instructional software and online resources. Consequently, teachers may need to re-examine and revise their beliefs concerning student learning, the most effective instructional approaches, and methods of assessing student learning (Nieveen & Plomp, 2018). Also, teachers' relations, and interactions play an important role in fostering change and success in education since, according to Fullan (2007, p. 97) "Change involves learning to do something new, and interaction is the primary basis for social learning." Whenever teachers work alone, they miss the opportunity to share ideas and provide encouragement and support to one another, while discovering new meanings, behaviors, and skills. Teachers are more likely to be motivated and satisfied with their work if they are able to learn and achieve results on the job.

3. Materials and methods

3.1. Study design, participants, and context

The study applied a multi-case qualitative design (Yin, 2018) to explore MAEd teachers' perceptions (n=140) of changing teaching conditions in 2020, 2021 and 2022 in the three largest cities in Sweden.¹ In Sweden, MAEd provides courses and programs to promote lifelong learning. Some MAEd programs offer vocational training, and complementary basic and upper secondary education, which prepare adult learners for work or university studies. Non-Swedish-speaking residents are also offered language training (e.g., Swedish for Immigrants). While in Sweden primary and upper secondary schools are being equipped with digital devices for every student, in accordance with the goals of inclusive education presented in the National Digitalization Strategy for education (Government Offices of Sweden, 2017), this is not the case for MAEd.

3.2. Data collection and analysis

The data for this paper are based on open-ended answers from a questionnaire, audio recordings from semi-structured interviews (transcribed verbatim) and

open-ended free-text answers (up to 250 characters at a time) with MAEd teachers from three separate MAEd schools. The MAEd teachers' ages, experiences of teaching in adult education, subject expertise, and other factors varied significantly.

The first data collection was initiated in November 2020, when the first author was approached by the Swedish for Immigrants (SFI) program director at one of the MAEd schools and asked to give a lecture addressing digital competence and remote teaching. The institution constructed an anonymous open-ended questionnaire on teachers' perceptions (n=60) of the evolving conditions for teaching practice, development of digital skills, and work-from-home practices.

The second data collection was conducted by the third author with observations and semi-structured interviews from April-November 2021 with MAEd teachers (n=20) in the second urban area to gain an in-depth understanding of how online teaching practices were evolving, by focusing on teachers' perceptions, attitudes, and beliefs.

The last data were collected in August 2022 during a lecture and an interactive question-answer (Q&A) workshop conducted by the first author with MAEd teachers (n=60) in the third urban area. The workshop was based on participatory design principles (Sanders, 2002), in which also the findings from the preliminary analysis of questionnaires from the first data collection were discussed.

The study was guided by ethical research practice principles (Swedish Research Council, 2018), including personal privacy compliance. Informed consent was sought before data collection and included information about the study, procedures, use and storage of data, and principles of anonymity (all the collected data has been anonymized). The respondents could withdraw any time (Swedish Research Council, 2018).

Data were analyzed using six phases of thematic analysis (Braun & Clarke, 2012) During the familiarization phase (1) the authors independently read the data. Notetaking was done during familiarization to systematically identify statements relating to the research questions. In the next phase (2), the authors searched for tentative themes where a deeper and shared understanding of the data was sought. The authors identified initial codes. The coding (3) and theme searching phases (4) can be described as overlaying the familiarization phase and were completed in parallel to recurring discussion meetings. In phase (5), temporary themes were continuously reworked until the whole data set was coded. The codes, the temporary themes, and the

¹ The information about the participating institutions or cities has not been provided due to ethical reasons of confidentiality and anonymity in research (Swedish Research Council, 2018).

relation between them were then decided among the authors as codes were refined and collated into broader themes (Braun & Clarke, 2012). In the final phase (6), the themes were named to reflect the content of each theme, and the authors co-wrote and revised the result section.

As a result of the thematic analysis, the notions identified in MAEd teachers' perceptions are further developed in the Discussion section which addresses the study's research questions. We relate our themes to the three dimensions of educational change, i.e., new materials, new pedagogies and altering beliefs (Fullan, 2007), described in 2.3 above.

4. Results

Five themes were identified in the data: (1) Acceptance, successive and surprisingly extensive development, (2) Disruption and emerging modes of education, (3) Teaching strategies, students' attitudes, and quality of teaching, (4) Implications for teaching in the online mode, (5) Remediation and repurposing of materials (see Table 1). Each quotation is tagged with theme and coding category, as outlined in Table 1.

4.1. Acceptance, successive and surprisingly extensive development

The pandemic pushed MAEd teachers, including those with limited digital competence, to advance their digital skills in online teaching and learning and to take a step towards overcoming technology skepticism. While some teachers at the time of the interviews did not see online instruction as teaching, others indicated a kind of acceptance that gradually developed into a more positive attitude:

I was quite negative when we started. I am more positive today. But it is probably because I feel a bit more confident and that I have had to try a few more tools and explore what I can do. I think we have become better today because we have been forced to rethink and think new. (1a, Interview, 20, 2021)

Although for many it was a successive and initially challenging endeavor, the closer and new experiences of online teaching and learning resulted in what they considered increased digital competence. In this push to online teaching, many of the respondents experienced comprehensive and profound competence development:

We had to digitalize. I have learned a lot, [and moved beyond practices] which I previously thought was very advanced. (1b, Questionnaire, 2020)

Table 1. Themes and coding categories

Themes	Coding categories
1. Acceptance, successive and surprisingly extensive development	a. Acceptance of online teaching b. Successive and extensive development of digital skills c. Enhanced awareness of digital infrastructure and learners needs
2. Disruption and emerging modes of education	a. Initial dropouts and problems b. Increased enrolment in online courses c. Subsequent consensus for a combined teaching design
3. Teaching strategies, students' attitudes, and quality of teaching	a. Effective for individualizing and group work b. Active students online c. Students' attitudes and quality of teaching d. Exploring theories, guidelines, and recommendations
4. Implications for teaching in the online mode	a. Structure and planning to activate students b. Reduced interaction between students c. Engagement more challenging online d. Teaching as collaborative design
5. Remediation and repurposing of materials	a. Repurposing physical designs to online mode b. Constant adaptation online c. New tools stimulate novel solutions

The respondents identified both technical barriers in the school's insufficient digital infrastructure and lack of digital resources relating to their learners' training impeding their development of digital skills.

In distance [education] we have also discussed possibly using Google Meet, but from experience it has not worked optimally for everyone, as conversations often freeze. (1c, Questionnaire, 2020)

4.2. Disruption and emerging modes of education

The teachers' answers also reveal that the initial shift to remote teaching led to dropouts of certain student groups, such as second language learners, students without previous complete schooling, and in specific subjects, e.g., music. According to the teachers, these students had limited digital skills and struggled with understanding instructions for online connection. Some students also lacked proper Internet access and decided to postpone their studies:

Many students miss school. Because it is digital, some refrain from studying and wait for the next period. (2a, Questionnaire, 2020)

However, the MAEd teachers also observed a change as the enrollment in online courses surged, indicating a growing inclination towards online education. This change was accompanied by a demand for hybrid classes which both fostered face-to-face interaction among students and provided opportunities to individualize participation and support:

Previously, me and [name] had 35 learners in each course. Now [online] we have 70, while the other teachers [on campus] have 25-30. The learners want to come to us. (2b, Interview, 12, 2021)

Subsequently the analysis shows a development toward a clear consensus among the MAEd teachers of a combined teaching design with possibilities to choose between diverse digital resources and practices identifying what suits their needs in a given situation:

Students who have classroom teaching also work digitally in the classroom once a week to get used to the possibility of online learning. (2c, Questionnaire, 2020)

I have used [digital LMS] for years. We hadn't had it as a standard for everyone before, but now it is. I don't think we can get back to what it was before the pandemic, because we have found ways that work and save time and complement what we were skilled at before. (2c, Interview 16, 2021)

The MAEd teachers talked about emerging modes of teaching as if there had been a change. They worked hard to keep the learners motivated, adapting the teaching as needed. For instance, they raised the possibilities to offer new course arrangements as “half-distance” (2c, Workshop, 2022). They value their new attempts and creative approaches to online education and learning based on the technology being used.

4.3. Teaching strategies, students' attitudes, and the quality of teaching

The emerging modes of instruction were guided by the schools' and teachers' responses to meet learners' needs and preferences by utilizing digital resources as effective tools for individual and group work:

Besides that, Lunis makes it easier to adapt the teaching to the student's individual needs, so each student can study at his own pace and when it suits him. (3a, Questionnaire, 2020)

According to the teachers, many students became more active online compared to the on-site classroom:

A large number of students who did not dare to take their place in the classroom took their place in the digital room. (3b, Workshop, 2022)

However, the teachers also raised concerns about their students' attitudes to online teaching and the risks in relation to transparency and trust in maintaining the quality of teaching:

I've added more oral recordings to Flipgrid, so it won't just be written. It's also so I can tell them. Sometimes there were “ghost writers” [in their submissions]. To counteract that, I create tasks that cannot be done by others. (3c, Interview 14, 2021).

Difficult to assess students' knowledge when everything happens remotely. (3c, Workshop, 2022)

The teachers reported further exploring theories, guidelines, and recommendations that could support them in emerging teaching practices:

They study what is in the chapter at home, and then they already know a bit about which grammar we are about to study. So, we can practice together and be prepared. It's much better than doing everything in class at first. The flipped classroom I think is called. (3d, Interview 7, 2021)

The teachers also presented several examples of adopting a range of teaching methods, such as test-based learning, backward planning, special needs approaches, flipped classrooms, and more.

4.4. Implications of teaching in the online mode

Comparing the modes on-site, synchronous, and asynchronous online, teachers reflected on the changed conditions for interaction, engagement, and social presence requiring more attention and “*more focused thinking*” (4a, Workshop, 2022) from the teachers. The respondents continued that online teaching necessitates thorough and beforehand planning:

Because they do it asynchronously, you have to design the structure in advance. In the classroom, you can control the discussion ad hoc. You must now decide on your learning path in advance. Now you must log in and give a response to x number of learners. (4a, Interview 11, 2021)

This is because, according to the respondents, online education demands a higher degree of precision in instructing students and a clear structure compared to the physical classroom in order to ensure a successful learning experience:

The most critical thing when I have learners online is clarity. That the instructions are clear, that what is written is clear. If you meet the learner in the classroom, you can explain several times. You meet them in a different way [online]. (4a, Interview 18, 2021)

Turning to student activity, the MAEd teachers notice an enhanced task focus causing “less learning among students” (4b, Workshop, 2022), longing for the missing meaningful dialogues among learners. One of the pivotal tasks mentioned by the respondents is the need to create student engagement in the digital classroom, which was considered to be considerably more challenging online:

In the classroom, it is very easy to say: face each other. Engagement is not as easy to create [online], so you must make more effort and think in different ways. I have become a better teacher because of this. (4c, Interview 16, 2021)

According to respondents, the pandemic further created incentives to share experiences among colleagues and to develop thoughts about teaching as flexible designing:

Lesson design is designing elements of lessons that are flexible and interchangeable. Design is a more flexible concept than lesson planning. (4d, Interview 13, 2021).

The synergies from this shared objective promoted professional development initiatives and discussions among colleagues in workplaces.

4.5. Remediation and repurposing of materials

The teachers reported identifying both novel materials and tools as well as creative uses for old or inherited ones. The respondents mentioned repurposing course designs from physical to online mode:

First, I wanted them to work on grammar. I refrained from adopting a face-to-face design [design for on-site teaching], as I have experienced that it doesn't work to use the whiteboard in the classroom during online lecturing. (5a, Interview 2, 2021)

In addition to adopting more digital tools and practices, the teachers also report on repurposing their designs when shifting from online to on-site education, giving examples of practices and content to apply:

We can bring some tools with us to investigate things and perhaps make assessments using forms. There may be information and course objectives in Google Classroom. (5a, Questionnaire, 2020)

The respondents also reported a constant adaptation of course materials for online teaching:

I have taken over an old Google classroom and reused the tasks. When I have run them once, I will change some. I add, remove, or keep. A feature of distance learning that I admire is its synchronous component. (5b, Interview 10, 2021)

Moreover, new tools stimulate the adoption of novel solutions. A teacher comments on developing an avatar to support online courses:

I have developed an avatar that provides information every week [posted in the LMS] using Lumilive. (5c, Interview 8, 2021)

To sum up, the MAEd teachers' answers reflect the practices that range from using rudimentary features of the applications, such as replacing the physical whiteboard in class with the sharing of a Word document in Zoom (instead of having a digital whiteboard), to more advanced practices, such as utilizing video snippets with teacher-look-alike avatars to convey weekly instructions in the LMS. The digital arena stimulated to use of a range of digital resources that, in turn, gave rise to more innovative practices.

5. Discussion

This paper explores MAEd teachers experiences of professional development pushed by the pandemic in terms of evolving materials (RQ1), changing pedagogies (RQ2), and altered beliefs (RQ3), guided by Fullan's (2007) ideas on educational change. In response to the dimension of new materials (RQ1), the findings clearly indicate an increased acceptance of modes of online delivery as well as an understanding of the challenges and opportunities associated with coping with technological advances (Theme 1). A significant and valuable improvement in digital competence was reported by MAEd teachers when teaching online, especially regarding teaching in emerging modes of delivery. Teachers' statements regarding recognition of the suitability of different modes of delivery and the use

of different tools for different learner groups (Theme 2) indicate that the pandemic contributed to their awareness of and the need for redesigning teaching situations and adapting learning spaces. The findings also demonstrate a plethora of examples of teachers adopting updated materials and repurposing existing ones for online and on-site teaching to ensure effective teaching and learning (Theme 5).

There is yet another indication of improved digital awareness, competence, and knowledge of the available digital infrastructure. The findings of this study indicate that, regarding novel pedagogies (RQ2), the pandemic compelled MAEd teachers to uncover and reconsider entirely new teaching methodologies in response to the transformed conditions of interaction, engagement, and social presence (Theme 4). In addition, teachers acknowledged that without access to digital resources, their capacity to explore and initiate change would have been significantly hindered. Nevertheless, the teachers also conveyed the challenges they encountered in replicating the pedagogical approaches and instructional design of the on-site mode in a remote setting (Theme 3 and 5). Instead, they found that online teaching and learning required a re-evaluation of teaching designs, including more meticulous planning, clear structuring, and explicit instruction to learners (Theme 4). Furthermore, there was an increased emphasis on actively engaging students both individually and collaboratively (Theme 3) (Käpplinger & Lichte, 2020). The MAEd teachers further showed tendencies to identify effective ways of personalizing and activating students remotely, dealing with issues of trust and quality of teaching at the same time (Theme 3). This indicates increased online teaching maturity and awareness of the limitations their learners might experience (Jeong & Hmelo-Silver, 2016; Rosin et al., 2017). In line with the research on the 'digital divide' and inequality in terms of Internet access (Belzer et al., 2022), the pandemic triggered MAEd teachers' abilities to identify students struggling with online teaching (Theme 2).

In terms of revised beliefs about learning (RQ3), it is evident that attitudes toward online education underwent a transformation from initial skepticism to a more receptive and embracing stance, accompanied by increased digital awareness, throughout the outbreak. The teachers reported that it was mainly during the first year of the pandemic that many student groups struggled with their studies, from this they determined that online schooling was not appropriate for all learners (Theme 1). Later, the MAEd teachers conveyed a shift in viewing online teaching in a new light, indicating changes in their preferences (Theme 2). From this new position, teachers reported spatially aware thinking, where they began combining synchronous,

asynchronous, and on-site delivery (e.g., some or all learners were sometimes asked to study on-site and at other times online) to fit the needs of the different learner groups and tasks (Leijon & Juni, 2021). However, teachers sought support from disparate learning theories that seemed disconnected from the emerging modes of instructional delivery (Theme 3). These findings nuance previous reports on the state of Swedish MAEd (Papadopoulos, 2022; The Swedish School Inspectorate, 2021; The National Agency for Education, 2021).

A shared vision is referred to as the foundation for educational development (Fullan, 2007). However, our research demonstrates that this development was not achieved through a shared vision, but rather through decentralization and bottom-up initiatives. The pedagogical model of such enterprises can be described as an 'everyone for himself/herself strategy' in the context of an industrial society (Nieveen & Plomp, 2018, p. 264). As a result of our study, MAEd teachers acted, at least at the beginning of the pandemic, in an emergency mode. This included exploring and developing practices as well as searching for guiding theories to inform online instruction (Theme 3).

6. Conclusion and implications

During the past three years (2020-2022), MAEd has experienced substantial material and pedagogical transformations that have resulted in radically altered beliefs regarding learning, discovery, and redefining tools and pedagogies. As a result of these emerging practices, teachers were challenged to overcome their skepticism of technology, develop their digital and pedagogical skills, and become change agents. The results from our study indicate signs of educational change consistent with Fullan's (2007) three dimensions of professional development, with revised materials, modified pedagogy, and altered beliefs about teaching and learning. In particular, the study provides empirical evidence for *institutional adaptation* as necessary and effective self-organization of education in response to crisis and abrupt change (Cleveland, 2018). This is prominently manifested in our findings related to the MAEd teachers' notable adoption and unexpectedly substantial development of advanced digital skills. Furthermore, it is evident in their pedagogical reflections amidst the disruptions and emerging modes of educational delivery, as well as their initiatives to adapt and repurpose materials, thereby expanding the available digital infrastructure.

The study implications concern above all the responsibility of educational institutions for proactive and strategic leadership to meet the needs of the lifelong learning community. To effectively transform MAEd

and ensure its continuous relevance in light of rapid societal changes, it is imperative to establish a shared vision that aligns with policy and national digitalization requirements, advocate for innovative funding models, and place organizational responsibility for professional development, rather than solely relying on individual teachers (cf. Pettersson, 2018). Achieving this requires collaborative efforts between national directives, MAEd leaders, and grassroots initiatives.

7. Limitations and future research

Collecting data during the pandemic influenced our ability to exert complete control over the process. Thus, our study is based on a heterogeneous data set from three MAEd institutions, collected during and directly after the pandemic, which can be seen as a limitation of the study. In future research, we will focus more on the challenges and needs of different learner groups in MAEd, such as migrants, people with special needs, to get better insights how to organize online education in the best way. Finally, comparing our findings from the Swedish context with international studies is the next essential step.

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