Closer to the senses in post-pandemic teacher training – Reclaiming the body in online educational encounters

Anna Martín-Bylund[1] · Linnea Stenliden[1]

Abstract

This study qualitatively examines synchronous online encounters in Swedish teacher education, learning from the distance and hybrid mode triggered by the Covid-19 pandemic, conceptualized as emergency remote teaching. The separation of bodies in such online teacher education challenges participants' sensory involvement and how they can be "present" to one another. The aim of this study is to scrutinize body-sensory dimensions of presence to enlighten online encounters in teacher training in circumstances of emergency remote teaching, as well as in contemporary and future online teacher education, generally. Online encounters were documented by video recordings during online seminars and lectures, and by diary entries and focus groups with eight teacher educators and their students. With inspiration from a posthumanist problematization of communication and post-qualitative methodology, the analytical process puts the concepts alterity and attunement to work with the data. Results show that online teaching encounters provides an altered body-sensory situation to which participants sensorily attune in different ways, bringing both positive, and troublesome affects. Different sensory attunements further involve exploiting some body-sensory dimensions (i.e. vision) when others are concealed. When performing teacher training of all levels through emergency remote teaching/online teacher education, awareness of how the material setting of online encounters affects the body and thus the didactic conditions for building meaningful relationships in the study environment, is important. Since the lived body has a key role in teachers' professional becoming, the study suggests a critical, creative consideration of its full sensory, along with further, qualitative expansion of online teacher education.

Keywords Online teacher education · Emergency remote teaching · Online teaching · Social presence · Body-sensory · Posthumanist · Post-qualitative

✉ Anna Martín-Bylund
anna.martin.bylund@liu.se

Linnea Stenliden
linnea.stenliden@liu.se

1   Department of Behavioral science and Learning, Linköping University, Linköping, Sweden

1 Introduction

We live in times when seemingly apparent certainties appear to be challenged by crises such as climate-, conflict-, energy-, economic-, and etcetera (Boin & Hart, 2022). The recent Covid-19 pandemic is one example of how akin crisis, an unprecedented challenge created and further increased uncertainty worldwide. All levels of education experienced disruption including rapidly changed learning processes from face-to-face to online. While online teaching was not new to universities, the context of a total lockdown increased pressure on teachers to rapidly implement online formats for all types of learning activities. The emergency and magnitude of the situation became a catalyzer to the introduction and use of digital technology to an extent previously unknown. Covid-19 brought hesitation and dissipation to various aspects of programs, courses, and roles also in teacher education (Cutri et al., 2020). This not only increased the demand and further development of teaching skills in online teacher education (OTE), but evidence of how interpersonal dimensions are affected in encounters of emergency remote teaching (ERT) were requested as well, as the lived body has a key role in teachers' professional becoming (Dall'Alba, 2009; Godhe & Wennås Brante, 2022). The lessons learned from the online encounters during the pandemic are needed for contemporary and future OTE. This knowledge can shift the ways teachers and students perceive forthcoming problems and solutions (Van Nuland et al., 2020). However, the level of success depends to a considerable degree on whether the challenges of the specific crisis are superficially or profoundly framed (Spector, 2019). Hence, it is crucial to deepen the knowledge on how digital online settings during the crise of the pandemic affected teachers and students, when they were physically absent to one another (Moyo, 2020).

The way teacher education 'altered' during the pandemic opened for studying a variation of online teacher training situations in ways not previously possible. This enabled focusing on the particularities and uniqueness of synchronously performing different teacher training activities online, including the use of digital technology and the differences between analogue and digital online classrooms or settings (Donitsa-Schmidt & Ramot, 2020). As put by Flores and Swennen (2020): "the reality of the Covid-19 crisis raised questions about the nature of teaching and student-teacher relations, but it also raised the opportunity for teacher education to consider ways to re-educate teachers in unpredictable scenarios." (p. 453). In other words, online encounters in teacher training during the pandemic offered opportunities to explore what happens to education when the bodies of teacher educators (TE) and teacher students (TS), although digitally connected, were physically separated from each other. That the physical distance between bodies in online teaching prompts a *presence,* as defined by socio-psychological aspects, in terms of reproducing the intimacy and immediacy of face-to-face interaction was claimed by Gunawardena (1995) already before the turn of the millennium. The notion is considered according to the subjective experience of salience of the other person, and the interpersonal relationship online. Such changed possibilities for perceiving the other and for expressing oneself have been associated primarily

to interpersonal and social aspects of presence (cf. Gunawardena, 1995; Haj-Bolouri & Flensburg, 2017; Lowenthal & Snelson, 2020). Social presence means the degree to which a person is connected to and perceived as a "real person" in mediated communication (Gunawardena, 1995). The particular material framing in such communication nevertheless associates body-sensory dimensions of presence (Martín-Bylund & Stenliden, 2020). The participants are present in their home, workplace or elsewhere from where they can not disconnect their bodies and sensory perception. Simultaneously the digital online setting also allows some sensory information to move between the heterogeneous spaces where the participants are present. The absence online of a common and shared physical framing reshapes the encounter, as it affects participants' bodily presence. Participants' physical orientation in the room and mutually, towards each other, is accentuated. When parallel, multimodal images attract participants' vision, and overlapping verbal and non-verbal sounds speak to their hearing, the sensory of each participant's body is challenged (Stenliden et al., 2021).

Considering this physical accentuation in relation to the body and the senses, this study learns from the distance and hybrid modes in Swedish teacher education, triggered by the Covid-19 pandemic and conceptualized as emergency remote teaching (ERT). The aim of this study is to scrutinize body-sensory dimensions of presence to enlighten online encounters in teacher training in circumstances of emergency remote teaching, as well as in contemporary and future online teacher education, generally. To address the aim the following research question is formulated: How do the online encounters in teacher training affect teachers' and students' body-sensory?

To be clear, in this study online encounters in teacher training are performed in two different setting: 1) *distance mode*, when all students attend a lecture or seminar virtually from home, i. e. they all attend in the same way; 2) *hybrid mode*, when students attend a lecture or seminar in mixed ways; virtually in small groups of students at distance campuses, individually from home or attended in-person.

2　State-of-the-art: Encounters in online teacher education

In the extensive literature on distance education, educational technology and technology-enhanced learning, social presence is a central concept in relation to what takes place in online teaching situations (Gunawardena, 1995; Tu & McIssac, 2002; Garrison & Anderson, 2003). However, the phenomenon of presence is versatile and complex, since its configuration depends profoundly on the social context and material situation (Haj-Bolouri & Flensburg, 2017; Lowenthal & Snelson, 2020; Ní Shé et al., 2019). To situate the study and reach comprehensiveness, specifically in relation to teacher education, research on OTE, both before and during the pandemic, is selected.

Research focusing on pre-pandemic OTE, according to a research overview by Dyment and Downing (2020), is fragmented and rather siloed. The review shows that research evidence is quite repetitive and foremost related to two well-established focal areas: technological pedagogical innovations and student experiences of participating in OTE. Research on teacher educators' experiences of

online teaching is scarcer and described as an emerging area important for the teacher profession. Carrillo and Flores' (2020) review of research papers published between January 2000 and April 2020 on the same topic confirms Dyment and Downing's (Dyment & Downing, 2020) findings. Furthermore, the body of research that deals with OTE related to the rapid changes/transmission regarding ERT presents a similar picture. Established practices changed quickly, with educators showing 'pedagogic agility' globally (Bao, 2020; Donitsa-Schmidt & Ramot, 2020; Flores & Gago, 2020; Flores & Swennen, 2020; Quezada et al., 2020; Zhang et al., 2020). Nevertheless, many principles and intentions of practice remained unchanged, despite the relocation to newly formed online settings, as did teacher educators' orienting values (Kidd & Murray, 2020). Even so, many of the unprecedented challenges for teachers and students commonly emerged through not sharing the same physical space (cf. Godhe & Wennås Brante, 2022; Moorhouse, 2020; Lenkaitis, 2020). Three main reasons are given: the mediated interactions/communication using video conference technology, discomfort using such technologies (e.g., Learning Management Systems), and changes in teachers' and students' interpersonal relations (cf. Allen et al., 2020; Donitsa-Schmidt & Ramot, 2020; Ferdig et al., 2020; La Velle et al., 2020; Moorhouse & Tiet, 2021; Scull et al., 2020). Suggested actions for TE to consider are the need for teachers' ability to modify their traditional face-to-face practices into teaching in a digital online setting (Rehn et al., 2016; Donitsa-Schmidt & Ramot, 2020). Scull et al. (2020) underlined the importance of building relations when teaching online, as the online classroom itself lacks some of the social environment found in a physical classroom. Moorhouse & Wong (2021) pointed out the importance of building relationships, even though this proved harder in online teaching because of technology mediated interactions. Often, as indicated by Bozkurt and Sharma (2020), findings and recommendations from studies during ERT conditions were not dissimilar to findings related to online teaching before Covid-19.

In the early research on online teaching considerable emphasis was placed on social presence. The attention was then turned towards the cognitive dimension of learning (Henri, 1992) which was a catalyst for Garrison et al. (2001) and Garrison (2007) to develop a comprehensive framework, the Community of Inqury, to guide the research and practice. Even though the concept of presence is central to online teaching, there are scant studies that specifically raise the concept in relation to OTE. However, the vast majority of the 134 papers examined in a litteratur review by Carrillo and Flores (2020) include issues related to social and cognitive presence, and underscore its significance relating to participants' involvement in teaching (e.g., Hramiak, 2010; Kilis & Yildirim, 2019; Komninou, 2017; Satar & Akcan, 2018; Yeh, 2010). Also, Fletcher and Bullock (2015) emphasized the ability of teachers and students to engage affectively in relationships, as this was central to meaningful educational experiences online. In another study, Ham and Davey (2005) illustrated that interactions that support presence were multiple, iterative, and reciprocal, and relied strongly on mutual respect, interdependence, and trust to focus on interpersonal connections. In a Swedish context, Godhe and Wennås Brante (2022) pay further attention to the interpersonal aspects in OTE. With reference to Reckwitz (2002), they identified how the 'teacher body' was changed in the online setting. The TEs' body language and eye contact were largely lost in that kind of setting.

The physical body became absent to a large extent and 'seeing as a teacher', they argue, was essentially replaced by the gaze of the camera. They concluded that the online setting limits or restricts bodily practices, articulated as a "deprivation of the teacher body" (Godhe & Wennås Brante, p. 12). Given the importance of the body in the professional becoming of teachers, more knowledge in this respect is necessary. In this paper, we further develop understanding by adopting a slightly different perspective on such body-sensory dimensions.

3 Conceptualizing (online) teaching as a real-time inter-bodily coordination

Our scrutiny of the body-sensory dimensions of presence is inspired by Alastair Pennycook's (2018) posthumanist problematization of the body and the senses in communication. This is a general approach, highly relevant to all teaching, wherever it takes place, as it stresses the sometimes forgotten role of the body.

In the situations studied in this paper, participants' bodies are geographically separated, with differing material settings and surroundings. Participants' bodies perceive and sense images (including gestures, faces and gazes), sounds (including voices), smell, taste, and touch just from where they are present. Hereby, at the same time the material conditions for each participant's spatial and sensory orientation differ. The digital connection between participants is based on screens, microphones, and speakers. This creates a fluidity of images and sounds, and the senses of vision and hearing may work with perception of what may come from very different geographical, physical/material origins. The senses of smell, taste and touch are also at work, but only in one material setting and delimited from the technological connection between different physical spaces. This exclusive position of vision and hearing as technologically privileged in online communication can be seen as significant for what Pennycook (2018) calls the human hierarchy of the senses, caused by Western societies' "making of Man as a rational and literate being, whose sensual engagement with the world is through eyes and ears" (Pennycook, 2018, p. 71). This hierarchical view and the separation of the senses derives from a reductive understanding of the sensory of individual bodies, which instead needs to be recognized holistically. More specifically, the sensory is a conjunction of the senses that can be explained with help of intersensoriality/synaesthesia (Howes & Classen, 2014). Subsequently, in this study, we draw attention to the manifold relations among different senses, to broaden the understanding of the body and the way it is conceptualized in online encounters, specifically focusing on teacher training.

This perspective aligns with a general description of communication and language in terms of a "real-time inter-bodily coordination" (Steffensen & Fill, 2014, p. 18). Such description highlights the importance of paying attention to the way bodies are present (and presented) as they communicate. Body-sensory aspects have often been disregarded when the cognitive aspects of communication and teaching are in focus. Pennycook's critique of notions like intersubjectivity and mutual understanding, often being considered normative of communicative practices, is relevant here since these concepts are often specifically underscored and prescriptive when it

comes to teaching and teacher training. Even if participants – teacher and students – may be directing their focus on the same thing in a communicative ecounter, their respective perception of it can never fully be shared, in terms of inter-subjectivity. This, Pennycook argues, is due to the heterogeneity of the world, and the multiple spatial and temporal variations of, and differences between people's body-sensory presences. Parting from such differences, communication cannot be seen as a simple exchange of information nor a mutual (cognitive) sharing of content or meaning. In a posthumanist-linguistic view, it must rather be described as the process and product of participants, continuously and differently adapting and integrating bodies (and words) in real-time and real space. Thus, understanding is always "messy, incomplete, different, complicated and never entirely shared" (Pennycook, 2018, p 107).

The concept of *alterity* – put to work in the analysis – points to such difference and diversity being normative of communication, and is used by Evans and Levinson (2009) when challenging the myth of linguistic universals, as discussed above. Alterity could be argued to be the only universal of communication since "communication involves multimodal and multisensory semiotic practices of the everyday, including the dynamic relations between semiotic resources, activities, artefacts and space" (Pennycook, 2018, p 107). Taking alterity as the norm does not mean, however, that we enter every single communicative practice as ignorant, or that there is no abstracted level of language or inter-bodily coordination. Obviously, people learn to deal with, quickly adapt to, and coordinate their bodies to other bodies in communication, through experiencing not identical but similar cultural, socio-historical, and multimodal situations (resources, activities, artefacts, and spaces). To address the multiple body-sensory dimensions at work in interaction, the concept of *attunement* (Brigstocke & Noorani, 2016) is employed in this paper. When bodies continuously adapt and coordinate themselves in relation to the altered presences of other bodies, this is an attunement. Alterity and attunement are thus seen and analytically employed in this paper as interrelated concepts.

Parting from this briefly sketched theoretical entrance we describe online encounters in teacher education as real-time inter-bodily coordination which opens for scrutinizing the body-sensory dimensions of presence.

4 Studying body-sensory dimensions of presence through post-qualitative methodology

An holistic view and posthumanist problematization of the body and the senses in online communication requires a research practice that seeks to decenter the rationalized, communicative subject (Pennycook, 2018), paying attention not only to the social circumstances but also to their intrinsic entanglement with materialities (Lather, 2013). Positioning the study in this way, within a posthuman onto-epistemology and post-qualitative methodology, is an attempt to disrupt taken-for-granted assumptions (Nordstrom, 2018). This entails another kind of researcher subjectivity, an inclusion of different types of data production, and an analytic

practice that allows for patterns of configurations which open up for unexpected readings of and listenings to materials quite other to interpretivist theories of coding (St. Pierre, 2011, 2021). Hence, the research practice aims to 1) facilitate different *types of data production* of inter-bodily coordination in the encounters, 2) enable *personal* (subjective-affective) stories on body-sensory encounters, and 3) permit *collective accounts* and *multipart reflection* when scrutinizing the body-sensory.

4.1 Context of the study and participants

As explained, the context of the study was teacher education programs, in this case at Linköping university, Sweden which means the researchers' (Author[1] and Author[2]) workplace. The Faculty of Educational Studies had announced special funding to enable data production concerning ERT within teacher education. This permitted us as researchers to investigate online encounters in teacher training in different modes and at different stages of Covid-19. Hence, the study was conducted with colleagues and students during the partial and total lockdown of higher education caused by the pandemic.

Eight teacher educators (TEs) and their teacher students (TSs) from four different educational programs in five course groups, participated in the study. The five course groups attended different types of online teacher training during the period of Covid-19. For most of the first two years of pandemic there was a total lockdown of the university, but there were shorter periods of "semi-lock downs", during which students in small groups could participate in their teacher education program with temporal adjustments, at dispersed campuses at a distance (to avoid social contact and traveling). Two kinds of online teaching are represented in the data, distance and hybrid mode:

- ERT (during "total lockdown") – distance teaching comprising online encounters, where both teachers and students participated from different devices, mostly from their homes.
- OTE at distance campuses (during short "semi-lock down") – hybrid teaching comprising online encounters, where teacher trainers were at the main campus of the university and students were together in smaller groups at distant campuses and some students participated from home.

The different online encounters in focus were lectures, seminars, and examinations. The participating teachers were all experienced teacher educators, who during non-pandemic circumstances taught mainly at campus-based teacher programs but also increasingly in recent years in OTE programs, where students work and participate from distant campuses. While all are teacher educators, the group is heterogeneous when it comes to educational levels of the programs they teach (preschool, leisure time, primary, special teacher training, and adult education). All but one of the TEs were women, reflecting the general gender representation at teacher training programs at this university.

4.2 Ethics

Being closely associated with your research subjects brings methodological and ethical challenges (Flodén, 2019). It is especially important that the study is conducted openly and transparently to consider whether potential participants will feel free to refuse to participate in the research of a colleague, whether it is appropriate for a researcher to have access to certain information about his/her colleagues and students based on information acquired in the course of research (Shi, 2006). Dual role conflicts, coercion, confidentiality, misconstruction, unawareness of the informed consent documents, etcetera, may emerge (Hammack, 1997). Therefore, we tried to ensure that the decision to participate was voluntary (Cleary et al., 2014) and, for example, that participation could be interrupted at any time (Swedish Research Council, 2017). The intention was that neither researchers nor participating teachers or students would experience discomfort, intimidation, misconstruction, etcetera, and that TEs and TSs consented to participate.

4.3 Producing data

Data were produced with the aim to scrutinize body-sensory dimensions of presence in online educational encounters of teacher training (ERT/OTE). To enable a multi-faceted view, different, complementing methods were employed with the recruited participants. During online encounters of lectures and seminars, video observations were made, which enabled mapping the visible and audible inter-bodily coordination in real time and material online setting. Teacher reflections of taking/being part in lectures and seminars online were documented through diary entries, which brought affective, personal aspects of the body-sensory involvement to the fore. Collective accounts of this involvement were produced through focus groups with teachers and students. These further enabled shared reflections on comparing the socio-material educational setting online during ERT with that on campus. The different data sets were carried out in interaction with one another, nurturing multifaceted accounts of the body-sensory dimensions; each one is further explained below.

4.3.1 Video captures: Inter-bodily coordination of the sensory

Video observations were carried out with a focus on the real-time inter-bodily coordination in the physical, digital setting of online encounters: between the technology, the TEs and the TSs (Hindmarsh & Heath, 2007). Video capture of three seminars was made by the screen recording tool offered by the video conference system (Zoom). Data were also produced during two seminars in the form of external video recordings of the teacher and the technology in the room from where the seminar was streamed. This created breadth of material, enabling an investigation of body-sensory dimensions in the inter-bodily coordination between teachers, students, and technology in real-time and material space.

4.3.2 Diary entries: Participants describing their body-sensory impressions

Participating teachers documented their work when delivering courses conducted online during ERT and OTE. This was in the form of diary entries, in close connection with the planning, execution and follow-up of the streamed seminars and lectures. The TEs' diary entries enabled an examination of their personal impression of body-sensory involvement in the current teaching situations (Browne, 2013). The plan was also that the students similarly would document their impressions from participating in the seminars and lectures conducted remotely online. This documentation was never submitted to us, perhaps for a variety of reasons, e.g., workload, disinterest, discomfort. Nevertheless, the focus groups organized with some students helped mitigate the loss of student information.

4.3.3 Focus groups: Participants discussing the body-sensory impressions

Focus groups were organized with the aim to create in-depth, collective accounts of participants' body-sensory impressions from online teaching (Flores & Alonso, 1995). The focus groups were held online, with one teacher group and two different student groups (Taylor, 2022); the point was to ensure a meaningful, empirical base for the study (Wilkinson, 1998). All sessions were semi-structured, meaning groups were organized with support of an interview guide and aiming to enhance a fruitful conversational climate, and trustworthy discussion. The guide included themes around: a) taking part in different kinds of online educational encounters with different aims, b) presenting oneself and perceiving the other (contact, interaction, communication) in or during online seminars/lecturers/examinations, and c) related thoughts on the future of (online) teacher education. The use of focus groups was motivated by an experimental approach (Mazzei, 2013). where the circumstances of producing the data are as important as the data itself. Thus, the group voice is more significant than each single participant since it is connected in the creation of a common, collective story (Lather & St. Pierre, 2013).

The focus groups took place via Zoom, which enabled audio, and screen/audio recordings of participants. The teacher focus group included five of the eight participating teachers. The other three were occupied elsewhere or had heavy workloads, although there may have been other reasons that we are unaware of. Both researchers helped manage the focus groups, one principally moderating and the other responsible for directing the conversations according to the interview-guide (Halliday et al., 2021). The teachers' session lasted just over one hour. The two student focus groups comprised seven and three participants, respectively. These students had actively volunteered and given consent to take part. The discussion in the larger group lasted 30 minutes and in the smaller group 44 minutes. The researchers' operating procedures were the same as with the teacher focus group.

4.4 Analytical procedures – Thinking with theory

An abductive approach inspired further methodological undertakings with the data. This entailed an analytical procedure, moving back and forth between data

and theoretical concepts, to meet the study's aim (Nordström, 2018). To illustrate, through several analytical sessions attended by us, both researchers, the video recordings of seminars/lectures were closely looked through, the diary entries were read and the recordings of the focus group were listened to. Simultaneously, we were attending to theoretical readings around concepts, with an openness towards novel associations and creative understandings (Lather, 2013; Jackson & Mazzei, 2013). In this way, through thinking with data and theory, connections were made that *intensified* some elements in the data (Stafford, 2004). Such elements (words, phrases, gestures, fragments, events, and etcetera) glowed, glimmered and gathered our attention. Put differently, some situations in video recordings, focus groups and diary entries became more significant than others (MacLure, 2013). These situations were crafted into *events* in English, around which the writing up of the article is clustered (Kuby, 2023; Martín-Bylund, 2017). This writing was done putting the analytical concepts alterity (Evans & Levinson, 2009) and attunement (Brigstocke & Noorani, 2016) in concert with the events. The concept of alterity was employed concerning body-sensory difference as it is either perceived or expressed in the events. The concept of attunement was employed to explore the multiple sensory dimensions at work when bodies continuously adapt and coordinate themselves in interaction with other bodies.

5 Findings – Scrutinizing the body-sensory of presence in encounters of OTE

The emergency of the online encounters studied in this paper opens for exploring the sensory work of the body when attuning to such altered situations. In the following section, as mentioned, by applying the concepts of alterity and attunement to different events, we will show 1) perceived/expressed body-sensory difference in the studied encounter online, and 2) how bodies are sensorily coordinated when attuning their presence to this situation. Thus, we illustrate how the online encounters affect participants' body-sensory.

5.1 Body-sensory protection and control

The first set of events are both from the focus group data where a TS (1a) and a TE (1b) reflect on differences between online and offline presentations.

5.1.1 Event 1a)

When you give an oral presentation online it's very different compared to when you make an oral presentation in a physical classroom. When you stand in front of everyone physically, it's a bigger concern and reason to worry. You get nervous and it's stressful. But when you sit at home, then the distance is an advantage, because you are protected by the screen. You have

your notes in front of you, everything is written there, so it's less stressful at a distance. Then again, it might be more fun to do it in a physical classroom, but it's more stressful.

(Lina, TS, in focus group)

Lina describes a difference in how she is affected by the material framing of giving a presentation in an online encounter from her home, compared to the materiality of a regular classroom. She mentions the distance between herself and other participants, the screen, whether you sit or stand, and whether you have 'everyone' or 'notes' physically in front of you, as playing a role in this difference. Lina's comparison between one setting and the other stresses the variation in the material and multimodal framing of the two settings. Furthermore, her employment of words like 'concern', 'worry', 'nervous', 'stressful', 'protected' and 'fun' highlights that different framings affect her in various ways. Her described emotions of giving a presentation are interwoven with the body-sensory *alterity* of doing it in different settings. In the digital, online encounter her presence *attunes* to the possibility of her body finding itself at a distance from other participants' seeing and otherwise perceiving appearances. 'Protected by the screen', the gaze on the notes, for instance, is blurred for others. We describe this attunement of her presence as a sensory coordination that provides less stress, nervosity, worry, and concern, even if also less fun.

The next event is with a teacher, who similarly describes a different bodily presence which affects her expression positively in the educational encounter online.

5.1.2 Event 1b)

Laura: I think as a teacher you gain more power in distance teaching compared to a physical classroom where you are sometimes even more vulnerable. In many ways I think this (digital/distance teaching) opens for new ways of not being a physical body the way you are in a physical classroom.
Int: And this is what gives you more power?
Laura: Yes (thinking)...yes, I think so.
Laura: I don't know ... a physical classroom. It can be ... it can be very nice and cozy when it works well, but it can also be incredibly stressful with big groups of students and you stand in front of and if you get a bit nervous, everyone notices that the sheets of paper in your hand are shaking a bit as you speak.

(Laura, TE, in focus group)

Like Lina, Laura counterparts the digital setting of the online encounter to the situation of a regular, physical classroom that includes the watching eyes and otherwise perceiving bodies of other participants. While the presence of student bodies is altered in the online setting, Laura describes how she sensory attunes to a possibility of 'not being a physical body'. This does not mean her body does not exist, live, and react in the room where she finds herself during teaching, nor that her hands

don't shake as she speaks. But the body-sensory alterity related to the online setting provides Laura with the possibility to present to her audience a restricted sensory expression. Attuning to a modified body-sensory presence furthermore includes a sense of being less 'vulnerable' and having more control or power.

The positive description of an inter-bodily coordination, where some sensory expressions can remain private, is not surprising in relation to a Western ideal of communication where sensory expressions of insecurity or anxiety, like shaking hands and flickering glances, are often associated with weakness and incompetence. While the control of one's own sensory expression in relation to what others can or cannot perceive of your body may be positive, the perception of others' restricted bodily expression seems to have a different, more negative affect. The next two events, from TEs' diary data and from the screen recording of a seminar, shed further light on this.

5.2 Body-sensory vagueness and discomfort

Event 2a is a screenshot from and a diary entry on an online teaching situation, where the students are together in groups at different campuses, and the teacher joins from her office at the main campus. This encounter happened during a short period of hybrid mode in the fall of 2020. Students are mainly connected through one web camera and one screen in their respective classrooms, participating in small groups at distance campuses. A few students are also participating individually from home. The teacher, Lisbeth, is an experienced teacher but new to this hybrid mode of teaching.
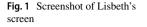
5.2.1 Event 2a)

> […] the distancing from the students. It was not only a geographical distance in the number of kilometers between the different places where we found ourselves, but also completely lacking possibility of identifying and personalizing the student bodies by their faces. […] The different digital online classrooms that manifested themselves on my screen seemed to be black holes. They absorbed all my energy and kept it. They felt like visually uncontactable, invincible knowledge arenas.
>
> Never had I been sweaty, exhausted, shaky and with a stiff body after teaching before. […] I had a strong sense of discomfort. I felt both physically and mentally overrun and the unpleasant feelings stayed long in my body; when I walked home from work, when I went to bed and when I woke the next morning. After 30 years of teaching, this was the most traumatic experience I ever had.
>
> (Lisbeth, TE, diary entry)

Lisbeth's reflections draw our attention to the screen as part of the material setting of her teaching. The screen (Fig. 1) mediates what the cameras capture from the various classroom locations. Whilst in a one-to-one site, each student sits in front

Fig. 1 Screenshot of Lisbeth's screen

of a camera, in this situation there is a distance between the camera and several students, making their appearance inexplicit and vague. The screen is a visually-based interactive interface, where image clarity varies according to the quality of the camera, as well as distance from, and the material variations of, the 'scene' it faces.

With her students at a geographical distance and digitally connected, Lisbeth depends on visual and auditive cues to read her students in online encounters. These cues are also blurred since the student bodies appear in darkness and their faces cannot be discerned. Furthermore, the different digital online classrooms are dim, manifesting to Lisbeth as black holes that 'swallow all her energy'. This is not due to technological disturbances or incompetence but a variation in the material setting, localized on Lisbeth's screen, that entails a body-sensory alterity that catches her by surprise and appears extremely difficult to rapidly accept and adapt to. Moreover, she is alone as a teacher in her office, while the students are together in physical groups, in classrooms providing other body-sensory alterities, e.g., screens mediating the (bigger and perhaps clearer) picture of herself. Attempting to discern the details of the different digital online classrooms and her students' bodies, faces and voices, her own body becomes 'sweaty, exhausted, shaky and stiff', drained of energy and she is 'physically and mentally overwhelmed'. Applying the concept of attunement to this example, we understand that attuning to the restricted or blurred

body-sensory presence of her students involves an extreme body-sensory engagement of her own. This results in physical unpleasure that stays with her long after finishing the class.

Student accounts of online encounters, where they were not able to fully perceive others in communication, were less extreme but similar. In a seminar video recording the TE, Amelie, had divided the TSs into breakout rooms for group discussions. When Amelie joined the groups, some didn't directly recognize her presence.

5.2.2 Event 2b)

Sam (TS): I think this (…)
Sofie (TS): Oh, now she's here.
Sam: (stops talking)
Amelie: (smiling)
Selma (TS): Hello Amelie
Amelie: Hi. How's it going?
Sam: Well, I didn't see you were here. (Laughing.)
Amelie: Sorry, I didn't want to interrupt your discussion.

(Video observation of seminar)

The students are surprised and caught off guard by the teacher's presence in their breakout room. Recognizing the presence of others when communicating in a separate breakout room is dependent on vision and audio. The sophisticated sensory awareness of a silent body, such as when a teacher discretely approaches a group discussion in a physical classroom, is altered by a significant, more "clumsy" interbodily coordination. Presuming the students in this breakout room were using the "speaker mode" afforded by the online application, the image of the currently talking person is enlarged on the screen, while other – mute – participants appear in minimized icons. This contributes to a body-sensory alterity where the simultaneity of both expression and perception is troubled. The discomfort expressed by students in the above situation must be understood in relation to the conjunction of the senses being "cheated". The silent approach of the teacher hereby causes the very thing she says she wanted to avoid. Students need to sensory attune to the altered body-sensory presence, which interrupts the flow of their discussion.

Both 2a and b indicate the troublesome work of the sensory when the coordination of bodies is performed through online applications. The way we think of this is not that participants are deprived of their bodies, but that the sensory is forced to work differently. The concluding set of events show that different ways of seeking to deal with this were found in the data.

5.3 Body-sensory 'strategies'

Event 3a shows a screenshot from a recorded seminar where TE, Madeleine, is moderating discussions. TSs have been preparing for this seminar groupwise. To address

these groups during the seminar, Madeleine needs to find a strategy other than asking them to sit together, the natural solution in a physical classroom.

5.3.1 Event 3a

> **Madeleine** (TE): Ok, I can't see your groups, so I want you to write your group letter next to your name on the nameplates.
>
> <div align="right">(Video observation of seminar)</div>

The image shows the teacher screen, where all 24 students in the seminar are lined up in a "gallery view" of side-by-side miniature icons. The teacher herself also appears as one of those icons among her students. Compared to teaching in a regular classroom, participants' bodies appear both closer yet more distant, and the view is condensed. Facial expressions, intimate hand and hair movements, as well as personal items like pictures on the wall, plants and even pets (second line, first icon from the right– a black cat!) come close, while the spatial body positions in the different rooms remain invisible and thus distant.

The screenshot is anonymized, so the nameplates that Madeleine refers to are removed. The use of written language to compensate for the lack of important spatial-visual cues on the screen can be seen as a completing strategy when sensory attuning to the alterity of the online seminar. This helps Madeleine's sorting which student belongs to which group. Nevertheless, the strategy also means Madeleine needs to further intensify the work of her eyes, which not only need to deal with the checkered visual multiplicity appearing on the screen, but must also read written language at the bottom of each icon. In this study, no eye tracker was used, but video recordings of TEs' faces working in front of the cameras confirm their intense, often

frenetic, eye movement. The encounter is, however, one example of how teachers use what they have to deal with the situation at hand. The technological affordances of *visually* based coordination of bodies are available and can be exploited differently, which the following focus group event with TEs will show.

5.3.2 Event 3b

As their main teacher, I eventually started prioritizing showing up at every single one of my students' classes, even when it was not me giving the lecture or seminar. My students were new to the university when the pandemic arrived and had little experience, so I had the impression that they needed to get a sense of context and connection. Normally, when students come to campus, the building is what gives them context, and I would never dream of running around, visiting all their classes. But it was not so much trouble for me to just digitally connect to them when I knew their schedule. I thought at least, this way, they could get some sort of stability.

(Anne, TE, in focus group)

Anne brings up her concerns regarding the lack of a common physical premise, which she describes as a point of connection and context that is especially important for new students. To compensate for this lack of physical connection and continuity, she describes how she started "showing up" at all her students' classes, even when someone else was giving the class. Anne's new, strategic routine can be seen as a sensory attunement to the body-sensory alterity of being a teacher at home, giving classes online. This encapsulates her sense of responsibility regarding this new group of students, which is materialized in her visual, bodily appearance to them on the screen.

Since the increase of OTE due to the emergency remote mode caused by the pandemic, several technological advances have developed. In our data, no teacher used functions such as immersive mode/together mode in the online applications, to provide a "cleaner", or more "realistic" view of the on-screen participants. These advances, related to different senses, may be helpful but the need for a synaesthetic consideration of students' and teachers' bodily presence in online encounters, highlighted by the results of this study, needs further consideration. Keeping this in mind, we now turn to discussing these results.

6 Concluding discussion

This study has scrutinized body-sensory dimensions of presence to enlighten online encounters in teacher training in circumstances of ERT, as well as in contemporary and future OTE generally. The analysis explored presence through participants' descriptions of body-sensory difference (alterity), and how participants sensorily attuned to such difference. Results illustrate how presence is deeply interwoven with how the body can express itself and perceive the expressions of other's bodies. This extends Ham and Davey's (2005) argument that presence in online encounters relies

profoundly on inter-personal relations, which are related to the core of teaching and teacher training. The result of this study motivates a discussion on the lived body as inseparable to these relations. The affects of the OTE setting on both teachers and students may be positive when the materiality of the encounter can hide some bodily expressions of, for instance, nervousness or insecureness. This may create a sense of more control and supremacy, compared to the similar situation in a physical, more "normal" teaching setting. Conversely, both teachers' and students' perception of others may also be troubled by the same alterity, causing interruptions in the communicative flow and a sense of discomfort, or unhelpful surprise. This is a deepening of the insights from Fletcher and Bullock (2015), who highlight that participating in online teacher training is to engage *affectively* in relationships meaningful to the educational experiences online. When performing teacher training of all levels through ERT/OTE, awareness of how the material setting of online encounters affects the body and thus the didactic conditions for building meaningful relationships in the study environment, is crucial. Furthermore, the same insights are important for preparing teacher students regarding their future profession.

The findings also build further on Godhe and Wennås Brante's (2022) results that emphasize that body language and eye contact are challenged in OTE, resulting in teachers feeling deprived of their bodies. Our results indicate that the availability of visual technological affordances is exploited when bodies' sensorily attune to the altered body-sensory situation of online encounters. Teachers employed different awareness strategies, like the use of written language when sorting student bodies into groups, and the continuous showing up of a head teacher's body to provide students with a sense of context and permanence. These sensory compensations, exploiting vision, are also noticed in teachers' high levels of eye-movement related to the condensed on-screen visual information that forms part of the material setting. The coordination of bodies in real-time is thus dynamic, attuning, and compensatory in relation to the material setting. When some aspects of a person's sensory are "silenced" in communication, others must be "louder" or work harder. Nevertheless, shown is that each body is intact, where it finds itself, but that it must work differently. A further problematization of this difference is needed in relation to the quality of teaching in general, and OTE specifically.

Considering these results, we underscore the importance of taking participants' full sensory into account in educational encounters online. Participants' bodies are always integrally and fully present to themselves, a fact that cannot be overlooked when considering teacher-student relations, which are never neutral. These are not private, but personal; not sentimental, but sensitive (Satar & Akcan, 2018; Ham & Davey, 2005). Considering participants' intact sensory further associates the emotional aspects expressed in the data. The accounts of worry, nervousness, fun/boredom, being overwhelmed, and responsibility and power play an important part, and must be considered as highly present in online encounters. The fact that the body-sensory expressions of these emotions do not easily make it through the technological affordances emphasizes, rather than erases, their affect on the teacher-student relations (cf. Godhe & Wennås Brante, 2022). This article's focus on the lived body differs from early analytical models for studying participants' online educational experiences. Parting from the findings, we argue that, independent of whether we

analyze presence in terms of its social, cognitive or teaching components, presence always has an intrinsic bodily dimension, which deserves further deliberation.

This bodily dimension needs to be acknowledged in its complexity with a critical and creative engagement with technological advancements and how these may be employed and developed within OTE. For this, a problematization of the body-sensory in teaching in both online and offline settings is core. Embracing the alterity of the material setting in OTE, shown in this study, both teacher educators and teacher students attune to a different body-sensory engagement, where the sensory is forced to work differently. Developing sustainable strategies in relation to this is obviously core to both contemporary and future OTE. However, technology for online encounters may sometimes seem to honor a peeled off presence that attenuates or conceals bodily nuances of communication (Rehn et al., 2016)). In relation to OTE, and the intrinsic relational character of teaching, this is an aspect that needs to be specifically weighd as a lesson learned from the ERT. For OTE not to be hijacked in a, by technology further advantaged, efficiency discourse on education, the ambition for OTE must be not only to arrive at strategies that work, but also at what works well, and for what (Biesta, 2021). This study illustrates the importance of an holistic understanding of presence in OTE. Failing to recognize the conjunctive, synesthetic, and sensory dimensions of presence (cf. Howes & Classen, 2014), will reproduce a reductive and instrumental picture of the task of teacher education and the becoming of future teachers. Hence, parallell to a discussion on strategies, a question worth further reflection, is how teacher education may contribute to fostering judicious, responsive teachers in various online/offline settings, as well as how to prepare teacher students for the same modal variation in their future professon. The core of teaching skills, whatever level of the educational system and regardless of online/offline settings, will always be defined as relational, personal, and sensory. The becoming of teachers can thus never be separated from their lived bodies (Dall'Alba, 2009).

We are aware that this study is limited in that it concerns only a few teacher educators and teacher students at one single university. This prompts a need for further related research. However, we argue, the analysis is based on convincing empirical examples and highlights an important area of inquiry in the complex matters of teacher training, as it is increasingly being performed through online encounters. Learning from the ERT modes in Swedish teacher education, triggered by the Covid-19 pandemic, is by means of the assumption that extreme situations may open our vision towards the subtle dimensions of everyday life that are too mundane to normally catch our attention, but nevertheless important. In this case, the extreme situation sheds light on the role of the body-sensory in educational encounters. Coming closer to the senses in post-pandemic teacher training, specifically when performed online, is a means of embracing not only what works but the subtle dimensions of what works well. This, we argue, is a way of staying close to the basics of education, when meeting with future technological advances and unforeseen situations. It is necessary for ensuring quality in future ERT/OTE, and supporting forthcoming teachers at all levels to cope with and adapt to educational change and societal uncertainty.

Declarations

Ethical approval All ethical approvals have been obtained; the participants provided informed consent prior to enrolment in the study.

Competing interests The authors have no competing interests to declare that are relevant to the content of this article.

References

Allen, J., Rowan, L., & Singh, P. (2020). Teaching and teacher education in the time of COVID-19. *Asia-Pacific Journal of Teacher Education, 48*(3), 233–236. https://doi.org/10.1080/1359866X.2020.1752051

Bao, W. (2020). COVID-19 and online teaching in higher education: A case study of Peking University. *Human Behavior and Emerging Technologies, 2*, 113–115. https://doi.org/10.1002/hbe2.191

Biesta, G. (2021). *World-centered education. A view for the present*. Routledge.

Boin, A., & Hart, P. (2022). From crisis to reform? Exploring three post-COVID pathways. *Policy and Society, 41*(1), 13–24. https://doi.org/10.1093/polsoc/puab007

Bozkurt, A., & Sharma, R. C. (2020). Emergency remote teaching in a time of global crisis due to coronavirus pandemic. *Asian Journal of Distance Education, 15*, 1–6.

Brigstocke, J., & Noorani, T. (2016). Posthuman attunements: Aesthetics, authority and the arts of creative listening. *GeoHumanities, 2*(1), 1–7. https://doi.org/10.1080/2373566X.2016.1167618

Browne, B. C. (2013). Recording the personal: The benefits in maintaining research diaries for documenting the emotional and practical challenges of fieldwork in unfamiliar settings. *International Journal of Qualitative Methods, 12*(1), 420–435. https://doi.org/10.1177/160940691301200121

Carrillo, C., & Flores, M. A. (2020). COVID-19 and teacher education: A literature review of online teaching and learning practices. *European Journal of Teacher Education, 43*(4), 466–487. https://doi.org/10.1080/02619768.2020.1821184

Cleary, M., Walter, G., & Jackson, D. (2014). Above all, 'do no harm': Key considerations when including students as research participants in higher education setting. *Contemporary Nurses, 49*, 93–95.

Cutri, R. M., Mena, J., & Whiting, E. F. (2020). Faculty readiness for online crisis teaching: Transitioning to online teaching during the COVID-19 pandemic. *European Journal of Teacher Education, 43*(4), 523–541. https://doi.org/10.1080/02619768.2020.1815702

Dall'Alba, G. (2009). Learning professional ways of being: Ambiguities of becoming. *Educational Philosophy and Theory, 41*(1), 34–45.

Donitsa-Schmidt, S., & Ramot, R. (2020). Opportunities and challenges: Teacher education in Israel in the Covid-19 pandemic. *Journal of Education for Teaching,* 1–10. https://doi.org/10.1080/02607476.2020.1799708

Dyment, J. E., & Downing, J. J. (2020). Online initial teacher education: A systematic review of the literature. *Asia-Pacific Journal of Teacher Education, 48*(3), 316–333. https://doi.org/10.1080/1359866X.2019.1631254

Evans, N., & Levinson, S. (2009). The myth of language universals: Language diversity and its importance for cognitive science. *Behavioral and Brain Sciences, 32*(5), 429–492.

Ferdig, R., Baumgartner, E. Hartshorne, R., Kaplan-Rakowski, R., & Mouza, C. (2020). Teaching*, Technology, and Teacher Education during the COVID-19 Pandemic: Stories from the Field*. Association for the Advancement of Computing in Education (AACE). https://www.learntechlib.org/p/216903/

Fletcher, T., & Bullock, S. M. (2015). Reframing pedagogy while teaching about teaching online: A collaborative self-study. *Professional Development in Education, 4*(4), 690–706. https://doi.org/10.1080/19415257.2014.938357

Flodén, J. (2019). Doing research on your colleagues: Practical and ethical challenges in being closely related to your research subjects. In *SAGE research methods cases part 1*. SAGE Publications, Ltd.. https://doi.org/10.4135/9781526477873

Flores, J. G., & Alonso, C. G. (1995). Using focus groups in educational research: Exploring Teachers' perspectives on educational change. *Evaluation Review, 19*(1), 84–101. https://doi.org/10.1177/0193841X9501900104

Flores, M. A., & Gago, M. (2020). Teacher education in times of COVID-19 pandemic in Portugal: National, institutional and pedagogical responses. *Journal of Education for Teaching, 46*(4), 507–516. https://doi.org/10.1080/02607476.2020.1799709

Flores, M. A., & Swennen, A. (2020). The COVID-19 pandemic and its effects on teacher education. *European Journal of Teacher Education, 43*(4), 453–456. https://doi.org/10.1080/02619768.20

Garrison, D. R. (2007). Online Community of Inquiry Review: Social, cognitive, and teaching presence issues. *Journal of Asynchronous Learning Networks, 11*(1), 61–72.

Garrison, D. R., & Anderson, T. (2003). *E-learning in the 21st century: A framework for research and practice*. Routledge Falmer.

Garrison, D. R., Anderson, T., & Archer, W. (2001). Critical thinking and computer conferencing: A model and tool to assess cognitive presence. *American Journal of Distance Education, 15*(1), 7–23.

Godhe, A.-L., & Wennås Brante, E. (2022). Interacting with a screen – The deprivation of the 'teacher body' during the COVID-19 pandemic. *Teachers and Teaching*. https://doi.org/10.1080/13540602.2022.2062732

Gunawardena, C. N. (1995). Social presence theory and implications for interaction collaborative learning in computer conferences. *International Journal of Educational Telecommunications., 1*(2/3), 147–166.

Haj-Bolouri, A., & Flensburg, P. (2017). Conceptualizing the essence of presence in distance education through digital Dasein. *International Journal on E-Learning, 16*(2), 149–173.

Halliday, M., Mill, D., Johnson, J., & Lee, K. (2021). Let's talk virtual! Online focus group facilitation for the modern researcher. *Research in Social and Administrative Pharmacy, 17*(12), 2145–2150.

Ham, V., & Davey, R. (2005). Our first time: Two higher education tutors reflect on becoming a 'virtual teacher'. *Innovations in Education and Teaching International, 42*(3), 257–264. https://doi.org/10.1080/01587910500168017

Hammack, F. M. (1997). Ethical issues in teacher research. *Teachers College Record, 99*(2), 247–265.

Henri, F. (1992). Computer conferencing and content analysis. In A. R. Kaye (Ed.), *Collaborative learning through computer conferencing: The Najaden papers* (pp. 117–136). Springer-Verlag.

Hindmarsh, J., & Heath, C. (2007). Video-based studies of work practice. *Sociology Compass, 1*(1), 156–173.

Howes, D., & Classen, C. (2014). *Ways of sensing: Understanding the senses in society*. Routledge.

Hramiak, A. (2010). Online learning community development with teachers as a means of enhancing initial teacher training. *Technology, Pedagogy and Education, 19*(1), 47–62. https://doi.org/10.1080/14759390903579265

Jackson, A. Y., & Mazzei, L. A. (2013). Plugging one text into another: Thinking with theory in qualitative research. *Qualitative Inquiry, 19*(4), 261–271. https://doi.org/10.1177/1077800412471510

Kidd, W., & Murray, J. (2020). The Covid-19 pandemic and its effects on teacher education in England: How teacher educators moved practicum learning online. *European Journal of Teacher Education, 43*(4), 542–558. https://doi.org/10.1080/02619768.2020.1820480

Kilis, S., & Yildirim, Z. (2019). Posting patterns of student' social presence, cognitive presence, and teaching presence in online learning. *Online Learning, 23*(2), 179–195.

Komninou, I. (2017). A case study of the implementation of social models of teaching in E-learning: The social networks in education, online course of the inter-orthodox Centre of the Church of Greece. *TechTrends, 62*(2), 146–151. https://doi.org/10.1007/s11528-017-0247-4

Kuby, C. R. (2023). Thinking-writing (pedagogically) inspired by post-philosophies: A qualitative(ly) DiffŽrance. In D.L. Carlson, A. Romero, & A.M. Vasquez, Writing and the articulation of Post-qualitative research [Elektronisk resurs]. Taylor & Francis Group.

La Velle, L., Newman, S., Montgomery, C., & Hyatt, D. (2020). Initial teacher education in England and the Covid-19 pandemic: Challenges and opportunities. *Journal of Education for Teaching.* 1–13. https://doi.org/10.1080/02607476.2020.1803051

Lather, P. (2013). Methodology-21: What do we do in the afterward*? International Journal of Qualitative Studies in Education, 26*(6), 634–645. https://doi.org/10.1080/09518398.2013.788753

Lather, P., & St. Pierre, E. (2013). Post-qualitative research. *International Journal of Qualitative Studies in Education, 26*(6), 629–633.

Lenkaitis, C. A. (2020). Teacher candidate reflection: Benefits of using a synchronous computer-mediated communication-based virtual exchange. *Teaching and Teacher Education, 92*, 103041. https://doi.org/10.1016/j.tate.2020.103041

Lowenthal, P. R., & Snelson, C. (2020). In search of a better understanding of social presence: An investigation into how researchers define social presence. In *Social Presence and Identity in Online Learning*, 5–23. Routledge.

MacLure, M. (2013). Classification or wonder? Coding as an analytical practice in qualitative research. In R. Coleman & J. Ringrose (Eds.), *Deleuze and research methodologies* (pp. 164–183). Edinburgh University Press.

Martín-Bylund, A. (2017). *Towards a Minor Bilingualism. Exploring Variations of Language and Literacy in Early Childhood Education*. (Diss). Linköping University Press.

Martín-Bylund, A., & Stenliden, L. (2020). Closer to far away: Transcending the spatial in transnational families' online video calling. *Journal of Multilingual and Multicultural Development, 4*(37), 587–599. https://doi.org/10.1080/01434632.2020.1749643

Mazzei, L. (2013). A voice without organs: Interviewing in Posthumanist research. *International Journal of Qualitative Studies in Education, 26*(6), 732–740.

Moorhouse, B. (2020). Adaptations to a face-to-face initial teacher education course 'forced' online due to the COVID-19 pandemic. *Journal of Education for Teaching, 46*(4), 609–611. https://doi.org/10.1080/02607476.2020.1755205

Moorhouse, B. L., & Tiet, M. C. (2021). Attempting to implement a pedagogy of care during the disruptions to teacher education caused by COVID-19: A collaborative self-study. *Studying Teacher Education, 17*(2), 208–227. https://doi.org/10.1080/17425964.2021.1925644

Moorhouse, B. L. & Wong, K. M. (2021). The COVID-19 Pandemic as a catalyst for teacher pedagogical and technological innovation and development: Teachers' perspectives. *Asia Pacific Journal of Education, 42*(1), 105–120. https://doi.org/10.1080/02188791.2021.1988511

Moyo, N. (2020). COVID-19 and the future of practicum in teacher education in Zimbabwe: Rethinking the 'new Normal' in quality assurance for teacher certification. *Journal of Education for Teaching: International Research and Pedagogy, 46*(12), 1–10. https://doi.org/10.1080/02607476.2020.1802702

Ní Shé, C., Farrell, O., Brunton, J., Costello, E., Donlon, E., Trevaskis, S., & Eccles, S. (2019). Teaching online is different: Critical perspectives from the literature. *Project Report*. Dublin City University. https://doi.org/10.5281/zenodo.3479402

Nordstrom, S. N. (2018). Antimethodology: Postqualitative generative conventions. *Qualitative Inquiry, 24*(3), 215–226. https://doi.org/10.1177/1077800417704469

Pennycook, A. (2018). *Posthumanist applied linguistics*. Routledge.

Quezada, R. L., Talbot, C., & Quezada-Parker, K. B. (2020). From bricks and mortar to remote teaching: A teacher education Programme's response to COVID-19. *Journal of Education for Teaching, 46*(4), 472–483. https://doi.org/10.1080/02607476.2020.1801330

Reckwitz, A. (2002). Toward a theory of social practices: A development in Culturalist theorizing. *European Journal of Social Theory, 5*(2), 243–263. https://doi.org/10.1177/13684310222225432

Rehn, N., Maor, D., & Mcconney, A. (2016). Investigating teacher presence in courses using synchronous videoconferencing. *Distance Education, 37*(3), 302–316. https://doi.org/10.1080/01587919.2016.1232157

Satar, H. M., & Akcan, S. (2018). Pre-service EFL teachers' online participation, interaction, and social presence. *Language Learning & Technology*, *22*(1):157–183. https://dx.doi.org/10125/44586

Scull, J., Phillips, M., Sharma, U., & Garnier, K. (2020). Innovations in teacher education at the time of COVID-19: An Australian perspective. *Journal of Education for Teaching, 46*(4), 497–506. https://doi.org/10.1080/02607476.2020.1802701

Shi, L. (2006). Students as research participants or as learners? *Journal of Academic Ethics, 4*, 205–220. https://doi.org/10.1007/s10805-006-9028-y

Spector, B. (2019). *Constructing crisis: Leaders, crises and claims of urgency*. Cambridge University Press.

St. Pierre, E. (2011). Post qualitative research: The critique and the coming after. In N. K. Denzin & Y. S. Lincoln (Eds.), *The SAGE handbook of qualitative research* (4th ed., pp. 611–625). Sage.

St. Pierre, E. A. (2021). Post qualitative inquiry, the refusal of method, and the risk of the new. *Qualitative Inquiry, 27*(1), 3–9. https://doi.org/10.1177/1077800419863005

Stafford, B. (2004). Revealing technologies/magical domains. In B. Stafford & F. Terpak (Eds.), *Devices of wonder: From the world in a box to images on a screen* (pp. 1–109). Getty Research Institute.

Steffensen, S. V., & Fill, A. (2014). Ecolinguistics: The state of the art and future orizons. *Language Sciences, 41*(A), 6–25.

Stenliden, et al. (2021). Lärares (digitala) kompetens före, under och efter covid-19: Skärvor av förståelse från skolor i Sverige. *Utbildning & Lärande, 15*(1), 7–26. [Stenliden, et, al. (2021), Teachers' Digital Competence Before, During and After Covid-19: Shivers of Understandings from Schools in Sweden, *Utbildning & Lärande, 15*(1), 7–26].

Swedish Research Council (2017). *Good Research Practice*. Retrieved from: https://www.vr.se/download/18.5639980c162791bbfe697882/1555334908942/Good-Research-Practice_VR_2017.pdf

Taylor, M. J. (2022). Focus groups online: Practical guidance for higher education researchers in the pandemic and beyond based on an autoethnographic reflection. In Huisman, J. & Tight, M. (Eds.), *Theory and method in higher education research,* (8), 163–179. Emerald Publishing Limited.

Tu, C., & McIssac, M. (2002). The relationship of social presence and interaction in online classes. *American Journal of Distance Education, 16*(3), 131–150.

Van Nuland, S., Mandzuk, D., Tucker-Petrick, K., & Cooper. T. (2020). COVID-19 and its effects on teacher education in Ontario: A complex adaptive systems perspective. *Journal of Education for Teaching*, 1–10. https://doi.org/10.1080/02607476.2020.1803050

Wilkinson, S. (1998). Focus group methodology: A review. *International Journal of Social Research Methodology, 1*(3), 181–203.

Yeh, Y. (2010). Integrating collaborative PBL with blended learning to explore preservice teachers' development of online learning communities. *Teaching and Teacher Education, 26*, 1630–1640. https://doi.org/10.1016/j.tate.2010.06.014

Zhang, W., Wang, Y., Yang, L., & Wang, C. H. (2020). Suspending classes without stopping learning: China's education emergency management policy in the COVID-19 outbreak. *Journal of Risk and Financial Management, 13*(58), 1–6. https://doi.org/10.3390/jrfm13030055

Publisher's note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.