



Experiences of WNGER II Ph.D. Fellows During the COVID-19 Pandemic – A Case Study

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Since January 2020 there have been over 97 million reported cases and 2 million deaths worldwide from COVID-19 and it is not over yet. In many ways, the COVID-19 pandemic is a slow-motion disaster and an ‘external intervention’ that suddenly began in early 2020 and has maintained its grip on the world. The pandemic has influenced the education sector strongly as well, and Ph.D. candidates enrolled in Ph.D. programs during COVID-19 (‘the Ph.D. corona generation’) at Western Norway Graduate School of Educational Research II (WNGER II) were examined in this case study. WNGER II is a research school consortium with seven universities and universities colleges, 97 Ph.D.-candidates, and 48 supervisors and was established in 2018 to complement the Ph.D.-programs and strengthen the Ph.D. education in Western Norway. A pilot phase (2016–2017) was used to identify and address specific challenges in Ph.D. education as experienced in the seven universities and university colleges in Western Norway. The pandemic has presented an urgent need for a better knowledge base to understand the professional, social, and existential conditions for doctoral fellows when society is shut down for an extended period. This explorative case study examined what the doctoral fellows experienced when home office, digital teaching, and digital supervision suddenly replaced physical presence in the workplace (more or less) from March 12, 2020 to November 30, 2021 as a result of the COVID-19 pandemic. A mixed-methods research, formative dialog research, and case study design was applied to try to bridge the conceptual and contextual understanding of this phenomenon. The main data sources were a survey ($N = 62$, 85% women, 15% men, response rate 70%) and semi-structured interviews (with six Ph.D. fellows). Supplementary data collection was based on formative dialog research and comprised field dialog (13 seminars, eight Ph.D. courses, three Ph.D. supervision seminars, and two Ph.D. gatherings, $N = 26$), one focus group ($n = 11$), 21 online observations, and document analysis of Ph.D. policy documents and course evaluations ($N = 15$). The explorative case study found that the WNGER II Ph.D. fellows are satisfied with the educational quality concerning digital teaching and supervision (micro-level) but have experienced several research-related and psycho-social challenges during the pandemic (meso-level). These changed frame factors have impeded their feasibility and doctoral progression. Even if the WNGER II Ph.D. fellows experienced support during the pandemic, it seems like it entailed

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incremental measures that have not been sufficient. The Ph.D. regulations were created before the pandemic under normal conditions *for* normal conditions, but it appears that no substantial adjustments have been made for these extraordinary pandemic conditions in which frame factors attached to data collection, publication delays, childcare responsibilities, social distancing, etc. have changed the premises for their feasibility. This has been particularly critical for these Ph.D. fellows, who have been in this slow-motion disaster for up to 20 months (55% of their 3-year scholarship). Therefore, results from the case study indicate it is more important than ever to understand the gap between formulation, -transformation, and realization arena when it comes to the distinction between incremental, semi-structural changes and fundamental changes in Ph.D. regulations and guidelines caused by societal crises. Even if time compensation has been offered, it seems like the overall Ph.D. guidelines, regulations, and assessment norms have remained unchanged in the transformation arena (meso-level), which might have given some unforeseen implications for some Ph.D.-candidates, which calls for better crisis preparedness on a doctoral level in the years to come.

Keywords: COVID-19, Ph.D. fellows, doctoral education, psycho-social experiences, case study, frame factors

INTRODUCTION

The COVID-19 pandemic so far has indeed elicited tremendous challenges, obstacles, and changes for doctoral education both in Norway and elsewhere. We all have seen how teaching and supervision needed to go online, with digital teaching becoming the new normal and doctoral fellows needing to study from their homes. The pandemic has created a further need for a better knowledge base to understand the professional, social, and existential conditions for doctoral fellows when society is shut down for a long time (Krumsvik, 2021; Krumsvik and Skaar, 2021; Krumsvik et al., 2021b). So, what happened to doctoral fellows from Western Norway Graduate School of Educational Research II (WNGER II) when the COVID-19 pandemic replaced physical presence with home offices, university lockdowns, digital teaching, and digital supervision?

In many ways, the COVID-19 pandemic is a slow-motion disaster (World Health Organization, 2021) and ‘external intervention’ that suddenly occurred in early 2020 and maintains a grip on the world nearly 2 years later. The disaster has for some Ph.D. candidates lasted up to 20 months (55% of scholarship time). Consequently, several questions arise on aspects such as PhDs’ experiences with university lockdown, digital teaching during the pandemic, psycho-social aspects, supervision, home office, childcare responsibilities, and employer support during the pandemic, etc., all of which are important frame factors to examine. Internationally it seems like the Ph.D. guidelines, regulations, and assessment norms have remained intact as this societal crisis continues. Thus, is crisis preparedness on the doctoral level sufficient both internationally and nationally? In light of this, it is important to examine whether Ph.D. regulations created under normal conditions *for* normal conditions have been adjusted for these extraordinary pandemic conditions to uphold sufficient education quality, PhDs feasibility, etc., in WNGER II. And if so, has it been implemented incrementally,

through semi-structured measures or fundamental measures for PhDs in WNGER II during the COVID-19 pandemic?

Against this backdrop, the present case study on PhDs from the Western Norway Graduate School of Educational Research II (WNGER II) builds on our previous research in the project Remote Teaching on Doctoral Level During a Societal Crisis, concerning Ph.D. experiences and remote teaching on the doctoral level (Krumsvik, 2016, 2017; Krumsvik et al., 2016, 2019, 2021a). The project was funded by the University of Bergen and is affiliated with the Pandemic Centre at the University of Bergen¹. The case study examined WNGER II doctoral fellows’ experiences between March 12, 2020 and November 30, 2021 on the micro- and meso-levels when almost all their learning activities shifted from physical to online mode. On this basis, we wanted to examine more specifically how the WNGER II PhDs have experienced their frame factors during the pandemic. The research questions in this study were:

- (1) To what extent has the COVID-19 pandemic impeded WNGER II PhDs frame factors on the micro-level, and how do they perceive this situation?
- (2) To what extent has the COVID-19 pandemic influenced WNGER II PhDs frame factors on the meso-level, and how do they perceive this situation?

PANDEMICS’ IMPACT ON DOCTORAL EDUCATION

When a societal crisis occurs, it is expected that universities have crisis plans in place, and COVID-19 so far has indicated a need for this. But how prepared were the universities for such slow-motion disasters like a pandemic? Earlier studies on

¹<https://www.uib.no/en/pandemic>

pandemics and education found various degrees of preparedness among universities internationally (Donohue et al., 2021). Some countries learned lessons from pandemics prior to the COVID-19 pandemic, e.g., in 2003, when the SARS epidemic hit Hong Kong (and other places), and in 2009, when the swine flu caused school closures (Dooyema et al., 2014). However, many of these plans dealt more with implementing technological measures, remote teaching, etc. due to the pandemics and less with more substantial frame factors like educational changes, PhDs feasibility, and psycho-social aspects. Regehr et al. (2017) revealed a need for more crisis preparedness concerning educational elements on the Ph.D. level, even if crisis planning, in general, is good. Also, other pandemics like Ebola and Zika increased the need for education crisis preparedness when they put societies on 'hold' for an extensive period.

International studies by Lauchlan (2019) from before the COVID-19 pandemic found that many PhDs experienced several psycho-social challenges, including stress. Similarly, Leveque et al. (2017) found that half of the PhDs experienced psychological distress, where a third were at risk of common psychiatric disorders. Evans et al. (2018) found that anxiety and depression were six times higher among PhDs than in the rest of the population. Josefsson et al. (2016) found some of the same tendencies and revealed that more women (40%) than men (30%) have considered 'dropping out' during their Ph.D. Norwegian studies (Akademiet for Yngre Forskere [AYF], 2016; Krumsvik, 2016; Krumsvik and Jones, 2016; Krumsvik et al., 2019, 2021a) also found that psycho-social stressors, time pressures, and publication pressures are quite common among PhDs. A study from Norway also revealed that four out of 10 PhDs believe they do more than they set out in their work plan (Reymert et al., 2017). Furthermore, Direktoratet for internasjonalsisering og kvalitetsutvikling i høyere utdanning [DIKU] (2021) found that in the last ten years, only two out of three have completed their doctoral degrees in Norway – partly due to psycho-social challenges and changed frame factors during their PhD-period. Despite a lack of substantial knowledge about how the COVID-19 pandemic has impacted the national completion rate during the pandemic, preliminary findings show a decrease in the national number of disputations in Norway in 2021 (Forskerforum, 2022).

If we take a closer look at PhDs' experiences so far during the COVID-19 pandemic, Le (2021) found that disruptions to their dissertation progress have been particularly challenging among international PhDs. Wang and DeLaquil (2020) found similar challenges, where PhDs received less feedback from their supervisors, and Bal et al. (2020) found that some PhDs experienced decreased dissertation progress during the pandemic, though others were coping with the situation. More specifically, Zahneis and June (2020) found that psycho-social problems among PhDs, expanded completion time, and delayed disputations increased during the pandemic. Extended completion time and delayed disputations can surface for several reasons, and might not be related to the genre of an article-based thesis. However, considering that most PhDs within the educational sciences and health sciences in Norway write article-based theses, they need to get one to four articles accepted for publishing in scientific journals before submitting their

doctoral theses at the end of their scholarship period (3 years). Internationally this is often named Thesis by Publication ("TBP," Mason and Merga, 2018). Within the educational sciences, the current state of knowledge about submission-to-publish time has been very limited during the COVID-19 lockdown.

However, anecdotal evidence indicates that several editors in scientific journals have found that the pandemic has impacted academics' willingness to review articles and editors' and reviewers' ability to keep up with their time schedules. Therefore, it seems like many journals within educational sciences and health sciences have experienced their scholars either refusing to review articles or asking for more time than usual; thus, review processes, in turn, may take longer than usual as a consequence of the pandemic. Another part of this issue is whether female PhDs' submission rates to scientific journals have decreased as a consequence of COVID-19, considering that women statistically have more childcare, household, and other responsibilities during lockdowns, including home schooling (see, e.g., Forti et al., 2021). This is also related to some other preliminary tendencies (Abdellatif and Gatto, 2020; Bal et al., 2020), indicating that PhDs with children (and other caretaking responsibilities) may be particularly vulnerable regarding their Ph.D. progress during COVID-19. With the increasing use of home offices among PhDs during the pandemic, several challenges have surfaced, and evidently, the pandemic changes both the frame factors and adds an extra layer to a group of students who already live in a stressful atmosphere. Herman et al.'s (2021) study found that PhDs and other junior researchers have been highly affected by, and carries a burden from, the ongoing pandemic. In particular, female PhDs and young researchers have experienced more care responsibilities during the pandemic, which has 'paused' their academic progress. Even if the majority may wish to avoid using a home office, digital teaching, etc., some PhDs also have certain good experiences from this situation. E.g., Børgeson et al. (2021) found that some PhDs (despite the unwanted crisis) were satisfied with the increased use of online platforms during the pandemic. From higher education in general, we find similar tendencies, and under certain circumstances, several meta-analyses found that digital teaching design, e.g., flipped classroom design, can enhance academic performance among students (Hew and Lo, 2018). However, more studies concerning PhDs' education quality during the pandemic are needed.

Studies from Norway during the pandemic (Stipendiatororganisasjonene i Norge [SIN], 2020; Akademiet for yngre forskere [AYF], 2021; Forskerforbundet, 2021; NIFU, 2021; University of Bergen [UiB], 2021) found that PhDs have experienced several challenges during the COVID-19 pandemic, particularly the problem of keeping up their feasibility and dissertation progress. NIFU's (2021) study found that it has required a lot of work to transition to digital teaching in Norway, including at the Ph.D. level. However, despite an extensive workload nationally attached to the transition to digital teaching, seven out of ten doctoral fellows think their progress has been delayed as a consequence of a difficult home office situation, describing their research activity and collaborations as being hindered or put on hold during the relevant period.

Forskerforbundet (2021) revealed that among PhDs and *post doc* who participated in a Norwegian study, 10% responded that their research had been critically changed, while 35% were significantly delayed, and a further 38% were somewhat delayed. Only 17% of the PhDs and *post doc* reported marginal to no effects from the pandemic. In the study by Stipendiatororganisasjonene i Norge [SIN] (2020), 84% of respondents (mainly PhDs) suffered delays in their projects due to the pandemic, and 87% expressed a need for time extension to make up for this delay. More generally, the vast majority of PhDs in this study have experienced isolation, loneliness, and deteriorating psycho-social health and quality of life during this period. In the study from 'Akademiet for yngre forskere [AYF]' (2021), over half the PhDs and young researchers reported having less time for research during the pandemic. The survey also found that among young researchers and PhDs with care responsibilities for children during the pandemic, 65% had less research time.

The host institution for WNGER II, the University of Bergen (UiB), submitted a COVID-19 survey to all PhDs and *post doc* at UiB during the spring of 2021 to map how this group had experienced the COVID-19 pandemic and its effect on their progress ($N = 845$, 50% response rate). Altogether, 88% of the respondents answered that their progress had been delayed to some extent. Among respondents that had worked in their current position for two years or less, 93% reported that they were delayed. Moreover, 63% of respondents reported that data collection or source work had been affected to some or a large extent by the COVID-19 pandemic, with 29% changing sources of data, databases or their research questions to some or a large extent due to pandemic-related issues. Ninety percent of respondents reported that they had to some (41%) or large (49%) extent maintained sufficient communication with their supervisors. However, 26% reported that they had not had satisfactory working conditions at home (University of Bergen [UiB], 2021). The PhDs were asked about extensions and the information that has been given about possible extensions to their contracts because of the COVID-19 pandemic. 45% of the respondents answered that they were dissatisfied or very dissatisfied with the information they have received about a possible extension of their contracts, though 51% reported having received an extension they sought and 32% still waiting on an extension decision (University of Bergen [UiB], 2021).

Both these studies and anecdotal experiences from Norway indicate that personal absence from the workplace alters how the PhDs perceived their (working) life and education situation, given the radically different working conditions during the pandemic. This applies, among other things, to the consequences of closures, social distancing, home offices, (digital) compulsory education, quarantines, and Covid-19 illness (for those who have experienced them). In particular, prolonged home office use has been the new normal for PhDs in Norway. This conflicts with the underlying premise of being employed, i.e., the duty of residence (the requirement for physical presence in the workplace), which has been almost impossible to fulfill during the pandemic due to closures and COVID-19 restrictions. The residency requirements intent is to create community, physical presence, togetherness, and cohesion in the workplace for PhDs, and this has been

replaced by home offices, remote teaching, and social distancing. Never before have PhDs experienced the consequences of such personal absence over such a long period of time – neither professionally, socially, nor existentially (Krumsvik et al., 2021b).

Another important part of the PhDs' progression is based on support and supervision from their Ph.D. supervisors, and academics often will confirm that doctoral supervision is 'the most rewarding aspect of academic life' (Halse, 2011, p. 560). Peelo (2011) found that 72% of PhDs and 90% of Ph.D. supervisors agree on the importance of good supervision to complete a doctoral thesis. The same study found that 28% of the PhDs expressed that poor supervision had hampered the doctoral process. A Norwegian study found that a clear majority of PhDs were quite satisfied with their Ph.D. supervision, while a minority remained unsatisfied (Reymert et al., 2017). Josefsson et al. (2016) found that women in particular reported experiencing much stress during their doctoral scholarship, with the problem of supervision, in particular, affecting them negatively. The Candidate Survey 2019 from the University of Bergen found that a majority of the PhDs were satisfied with their supervisors and supervision (5.6 on a Likert scale from 1 to 7), and that the PhDs also were satisfied with their training component (30 ECTS, 4.9 on a Likert scale from 1 to 7). However, 13% experienced scientific, project-related disagreements, personal conflicts, or employment-related conflicts with their supervisor/supervisors (University of Bergen [UiB], 2020).

During the pandemic, supervision has moved from physical face-to-face meetings to online meetings, making the situation more challenging. The United Kingdom Research Supervision Survey Report 2021 found that among the 3,500 Ph.D. supervisors in the United Kingdom, 65% felt that supervisory responsibilities have increased during the pandemic, 32% agreed that "concerns over supervision have kept me awake at night over the last 12 months" and 31% agreed that "supervising doctoral candidates makes me feel anxious over the last 12 months" (UK Council for Graduate Education, 2021). Börgeson et al. (2021) found that approximately 74% of the PhDs (in one of their sample groups) stated that they had experienced a decrease in supervision frequency during the COVID-19 pandemic.

In Norway, there has been an ongoing focus on doctoral supervision, particularly in the past ten years, in which the Norwegian Research Council found that "... Even though there have been positive developments over the last decade, the quality and access to supervision for Ph.D. candidates is not satisfactory for a considerable minority of Ph.D. candidates. Efforts to increase the professional development and training of supervisors are recommended" (NIFU, 2012, p. 10). The Norwegian Council for Higher Education found, in its preliminary investigation, that most universities and colleges had some in-service supervision courses and seminars, but only one university had five ECTS in doctoral supervision (Universitets- og høyskolerådet [UHR], 2018). This is the host institution in WNGER II (UiB), and the Candidate Survey from the University of Bergen found that even if a clear majority of PhDs are satisfied with their supervisors, they still think to a certain extent that the supervisors will benefit from supervisor training (University of Bergen [UiB], 2020). When it comes to Ph.D. supervisors among young researchers in Norway,

24% said they spent more time supervising PhDs during the pandemic (Stipendiatororganisasjonene i Norge [SIN], 2020). In the study from 'Akademiet for yngre forskere [AYF]' (2021), 29% of PhDs felt that they had received less supervision and were more often left to fend for themselves during the lockdown period.

For current PhDs in this case study, we wanted to examine whether, and eventually, how these frame factors, preliminary tendencies, and anecdotal evidence played out for the WNGER II PhDs during the pandemic.

Theoretical Framework

The present case study is explorative and intrinsic, thus we applied an abductive approach to theory where we used the frame factor theory as a theoretical framework (Lundgren, 1999; Lindensjö and Lundgren, 2014). The frame factor theory was developed by Ulf Lundgren and Urban Dahllöf during the 60s and 70s. Lundgren developed the frame factor theory further and claimed that society's impact on the education system came about expression through a target system, an administrative system and a legal system. Today the framework factor theory is a theory within educational sciences and pedagogy and is often used as a theoretical "lens" in educational planning and educational analysis. The theory is based on the idea that there are external factors in pedagogical contexts over which institutions, academics, and teachers have no direct control but which at the same time have a major impact on the outcome of educational training and teaching. Below we will elaborate on how the contextual use of the frame factor theory in this case study has been carried out.

One of the main reasons why maintaining education quality has been challenging on many levels during the COVID-19 pandemic is because digital teaching and supervision and home offices have created a situation which few university teachers have experienced before: being a teacher and supervisor in an online, digital learning context in which the PhDs have home offices over a relatively long period of time, with university teachers teaching and supervising from their homes. Some university teachers have worked in hybrid learning contexts, in which some PhDs are quarantined in their homes while the rest have been situated in the physical classroom at the university. Furthermore, some university teachers, for certain periods, have been teaching in ordinary learning contexts at the university (the physical classroom) where COVID-19 restrictions and practices, e.g., face masks and social distancing, have been the norm during the pandemic. This extraordinary situation changes the frame factors and adds a new layer when discussing education quality. Previous research shows that a gap often exists within (doctoral) education between the arena of formalization and the arena of realization in the frame factor theory (Lindensjö and Lundgren, 2014; Krumsvik et al., 2019). Linde (2012) expands the frame factor theory with the transformation arena in the middle and uses these three arenas to describe this process and explain why it is so difficult to implement measures in complex organizations like universities. A straight and linear relationship seldom exists between what is decided on a central level (the so-called formulation arena, or macro-level) and what finally is concretized and practiced in institutions (the so-called realization arena, or micro-level). Things happen along the way. Policy documents

and other steering documents need to be interpreted and applied by faculty leaders, Ph.D. program leaders, supervisors, and PhDs [the so-called transformation arena (micro central level) or meso-level] (Linde, 2012). On this backdrop, one of the main foci in this case study was to assess whether (and eventually how) WNGER II handles changed frame factors and education quality during the pandemic in this inter-institutional collaboration. NOKUT defines *education quality* "... as the quality of teaching classes and other facilities for learning, and students' learning outcomes after completion of education in terms of knowledge, skills and general competence" (Skodvin, 2013, p. 2). However, it is important to distinguish *between educational quality, study quality, and teaching quality*.

The term education quality is more general and more comprehensive than the study quality concept. The former includes everything from what is happening at the subject/study program level and up to the government's education policy means of promoting education quality. Thus, the study quality concept is narrower and refers to what is going on at the educational institution itself (Skodvin, 2013, p. 3).

Furthermore, one can say that teaching quality goes further to the micro-level, i.e., course quality, the quality of teachers' teaching in the specific doctoral courses, Ph.D. supervision, etc. So, in the present study, when we attempted to examine the micro- and meso-levels, it was implied how PhDs had experienced COVID-19 restrictions playing out on these two out of three levels. **Figure 1** below illustrates the analytical lenses in this MMR and formative dialog research (designed as a case study).

MATERIALS AND METHODS

In this study, we applied a mixed-methods research design, where quantitative data indicate the strength of associations and where qualitative findings explore the nature of these associations. We decided to use a three-stage design, *qual* → *quan* → *qual* (qualitative driven sequential design, Schoonenboom and Johnson, 2017); thus, it is a qualitative -dominant mixed-methods study. More specifically, an exploratory, sequentially mixed-methods design is needed for this study to answer the research questions (Creswell and Clark, 2011; Fetters et al., 2013). This type of research design imply that in an exploratory sequential design's first phase, the researcher first collects and analyses qualitative data and in the second phase second use these findings to inform quantitative data collection and analyses (Fetters et al., 2013). In the third phase, the findings from the quantitative data collection informs the further qualitative data collection and analysis. This also implies a form of *integration through methods*, applying integration through *building*, which occurs when results from one data collection procedure inform the data collection approach of the other procedure, the latter building on the former. This means that we executed an excessive cumulative data collection process and analyses, where questions for inclusion in the survey were built on previously collected field dialog data, online observation data, and document analysis data. And the questions in the qualitative interview guide are built upon previously collected quantitative data (survey) in

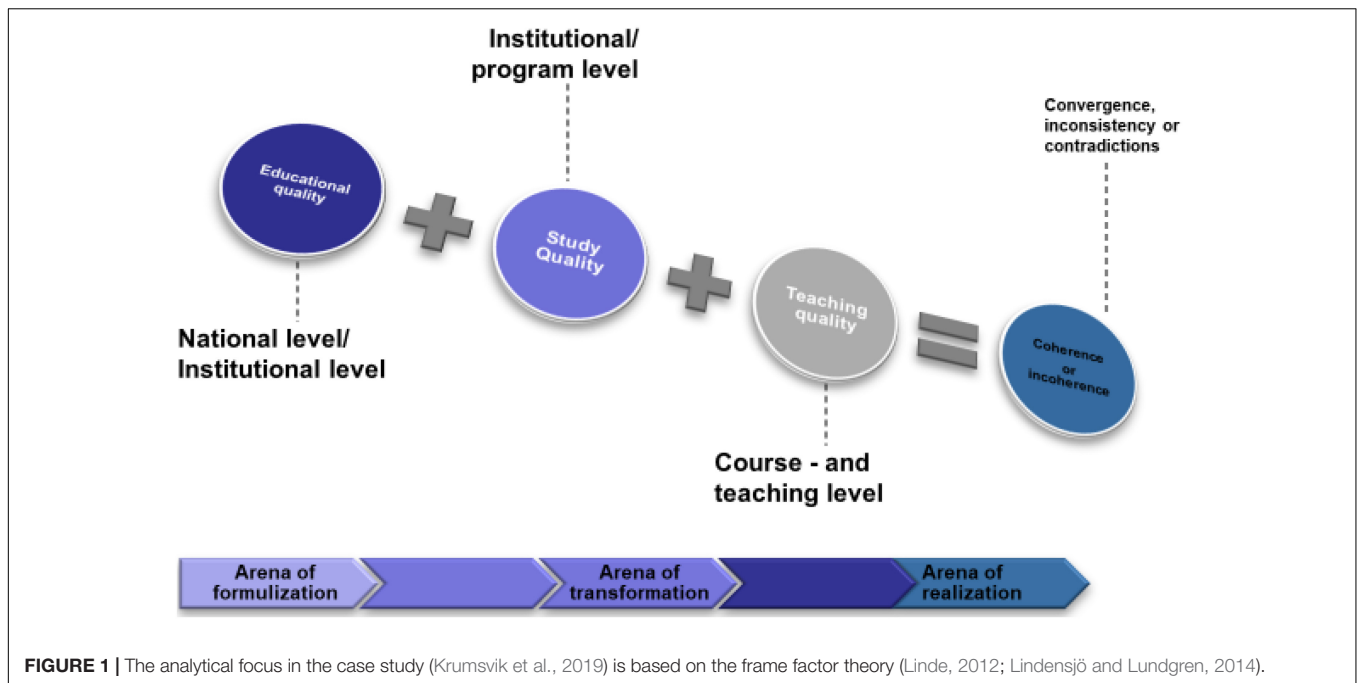


FIGURE 1 | The analytical focus in the case study (Krumsvik et al., 2019) is based on the frame factor theory (Linde, 2012; Lindensjö and Lundgren, 2014).

this study. And the interview guide for the focus group is built upon previously collected quantitative data (survey) and qualitative interview data (see **Figure 2** below). Furthermore, we integrated the research questions, methods, interpretation, and reporting levels, applying narratives where qualitative and quantitative results are reported in the same article in different sections through the *contiguous* approach (Fetters et al., 2013). The coherence between the qualitative and quantitative findings is mainly examined based on confirmation, expansion or discordance in this article (Fetters et al., 2013).

As a consequence of the mixed-methods design, it combines two approaches in case study research. The first, proposed by Stake (1995) and Merriam (2009), is situated in a social constructivist paradigm and is attached to the qualitative part (attached to the second part of each research question). The second, based on Eisenhardt (1989), Flyvbjerg (2011), and Yin (2012), approaches the case study from a post-positivist perspective (Hyett et al., 2014, p. 1) (attached to the first part of each research question). It is an intrinsic case study (Stake, 1995) in which we aim to focus on ecological validity: “Ecological validity is the degree of correspondence between the research conditions and the phenomenon being studied as it occurs naturally or outside of the research setting” (Gehrke, 2018, p. 563).

Informant selection was based on a purposeful method (Maxwell, 2005), in which we recruited PhDs (with a 3- to 4-year Ph.D. scholarship) from a research school (WNGER II) in Norway. To answer the research question, we undertook a combination of formative dialog research (Baklien, 2004) and case study research (Stake, 2006). The data collection comprised field dialogs (13 seminars, eight Ph.D. courses, three Ph.D. supervision seminars, and two Ph.D. gatherings, $N = 26$), a survey ($N = 62$, 85% women, 15% men, response rate 70%),

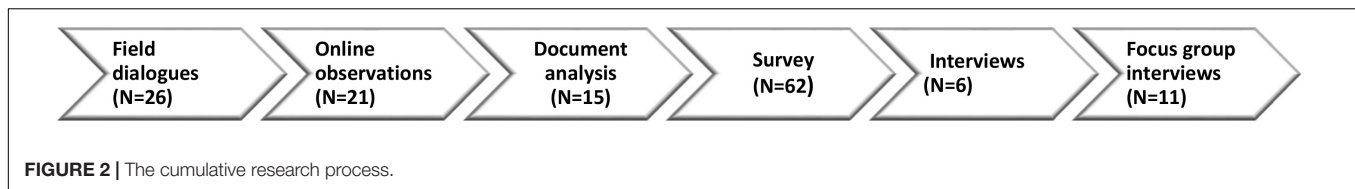
six semi-structured interviews (with PhDs), one focus group ($n = 11$), 21 observations and document analysis of Ph.D. policy documents from March 12, 2020 to November 30, 2021 ($N = 15$). Supplementary data are based on observations of the courses and reviews of relevant documents, such as evaluations of the doctoral courses/seminars. Furthermore, policy documents and regulations concerning Ph.D. education in Norway have been applied as supplementary sources.

When focussing on how the PhDs’ experience their frame factors changing, e.g., university lockdown, home offices, digital teaching, supervisors, doctoral progression, etc., and where the emphasis, in particular, is on illuminating the micro-level (course and teaching level) from PhDs’ perspective. The reason for this is twofold. One is that the program’s structure and quality directly affected the PhDs during the pandemic. The second is simply that they conducted several evaluations about matters related to the structure and quality compared with the others. However, supervisors’ opinions are nevertheless also important, and their views are also interwoven because some of them have been present during field dialogs and participated in the WNGER II supervision seminars.

When focussing on how PhDs’ experience their research progression, feasibility, well-being, psychosocial aspects, care responsibilities, their nearest superior, and their Ph.D. coordinator, the main focus is on illuminating the meso-level (institutional and program level).

Cumulative Research Process

In our case study, we executed an excessive cumulative data collection process and analysis from March 12, 2020 to November 30, 2021. The long time period allowed the researchers to test their interpretations along the way and detect contrary evidence,



e.g., reach saturation during the coding and analysis of the qualitative data (Creswell and Guetterman, 2021).

QUANTITATIVE PHASE

Participants

The sample ($N = 62$) was recruited through a research school. Participants included doctoral candidates in pedagogy, teacher education, humanities, educational science, health and sports science, special education, and psychology. Altogether, 62 participants (98.39% completion rate) completed a survey utilizing an online questionnaire (SurveyMonkey Inc, 2021) from December 2020 – to January 2021. The survey respondents were employed at the seven institutions in WNGER II and enrolled in six PhD-programs at different universities and university colleges in WNGER II. Please note that the sample size in the reported analyses differ due to some participants reporting that specific questions were not relevant to their situations during the pandemic. Due to a highly skewed gender distribution ($n = 52$, 85.2% women), we did not include an age variable to secure participants' anonymity.

Design and Procedure

The participants completed 42 questions that covered demographics (e.g., if the candidates had care responsibilities for children under age 18) and inquiries in which they were asked to (1) provide an overview of the status of their Ph.D. projects (e.g., whether the candidates believed they were on track to complete their dissertations on time); (2) describe challenges candidates have met during the COVID-19 pandemic (e.g., home office conditions, workload); (3) provide perspectives on remote teaching and the use of digital tools (e.g., satisfaction with the research school); and (4) gauge satisfaction and communication frequency with their affiliated institutions (e.g., Ph.D. supervisor, head of the department).

Measures

The questionnaire encompassed both multiple-choice items (e.g., important factors to complete the Ph.D. project) and five-point Likert-type items, measuring frequency (1 = very rarely, 2 = rarely, 3 = sometimes, 4 = often, 5 = very often), satisfaction (1 = very dissatisfied, 2 = somewhat dissatisfied, 3 = neutral, 4 = somewhat satisfied, 5 = very satisfied) and positive/negative influence of the pandemic (1 = very small extent, 2 = small extent, 3 = neutral, 4 = large extent, 5 = very large extent). Furthermore, some questions (e.g., care responsibilities) had binary yes/no options. Several of the questions included an option

for written feedback, while others were used later to develop the interview guide.

Data Analytic Strategy

Analyses were conducted in *R* (R Core Team, 2021). We used the built-in *stats* package to conduct basic descriptive and frequency analysis. To examine the possible relationship between Likert-type items, we conducted Spearman's rank correlation analyses using the *psych* package (Revelle, 2021) due to the data's ordinal nature (Schober et al., 2018).

Qualitative Phase

Field Dialogs

As part of the fieldwork, we conducted field dialogs, which were not agreed-upon interviews, but more reminiscent of everyday talk (Fossåskaret et al., 2006), in which one also learns the jargon and cultural codes in the appropriate environment. In this case study, the field dialogs ($N = 26$) provided valuable information on PhDs' perceptions and experiences during the pandemic. Therefore, the field dialogs provided answers to 'questions (that the) researcher had not thought in advance, and for which he had no preconditions to ask about' (Fossåskaret et al., 2006, p. 24). The field dialogs also gave rise to further validation of both the survey, interviews, focus groups, and observations, in this case, the study, in which the qualitative part had an ethnographic and naturalistic aim, which can be described as an 'ethnographic strategy in which the researcher researches the phenomenon within the context in which it occurs' (Saunders et al., 2016, p. 721). The data collected from the field dialogs were mainly attached to the 13 seminars, eight Ph.D. courses, three Ph.D. supervision seminars, and two Ph.D. gatherings during this period of time (March 12, 2020–November 30, 2021). In addition, interviewing the PhDs while they were in quarantine and/or in their home offices, having the focus group live on Zoom, conducting observations related to the doctoral courses/seminars, and holding field dialogs before-, during, and after the courses/seminars, etc., are examples of studying PhDs in typical, authentic pandemic contexts, i.e., during a societal crisis which gave additional field dialog information. Descriptive field notes were taken during field dialogs. While the quantitative part (survey) provided a general and conceptual understanding, the qualitative part (e.g., field dialogs) gave a more thorough and contextual understanding and validation of the PhDs' pandemic experiences. The analysis of the field dialogs was inspired by thematic analysis (Braun and Clarke, 2006; Braun et al., 2019), but as this source of data was different than the main data sources (survey and interviews), the analysis had a more descriptive meta-perspective. It was, therefore, essential to use these kinds of supplementary data sources for the initial design phase of the

case study, as well as for validation of preliminary findings from the main data sources.

Online Observation

This case study included *online observations* (Merriam and Tisdell, 2016), i.e., we observed and participated as lecturers in the online doctoral courses and seminars with Zoom ($N = 21$). Descriptive field notes were taken during these courses and seminars. Such notes were inspired by Merriam and Tisdell's (2016) checklist of elements important for observing (1) physical (online) settings, (2) participants, (3) activities and interactions, (4) conversations, (5) subtle factors and (6) researchers' own behavior. Such naturalistic observations (Hastie and Hay, 2012) focussed on discussions, questions, interactions, and both verbal and non-verbal communication. Participant observations were made by the first and partly third author to understand the specific context, triangulate and enhance the study's trustworthiness (Patton, 2015; Merriam and Tisdell, 2016), and describe specific incidents relevant as reference points for subsequent interviews (Merriam and Tisdell, 2016). The analysis of the online observations was inspired by thematic analysis (Braun and Clarke, 2006; Braun et al., 2019), but as this source of data was different than the main data sources (survey and interviews), the analysis had a more descriptive meta-perspective. It was, therefore, important to use these kinds of supplementary data sources for the initial design phase of the case study as well as for validation of preliminary findings from the main data sources.

Document Studies

Document analysis was a supplementary data source in this study, and Creswell and Clark described this analytical form in this way: "Qualitative documents are public documents (e.g., newspapers, minutes of meetings, and official reports) or private documents (e.g., personal journals and diaries, letters, and e-mails)" (Creswell and Clark, 2011, glossary). The intention is to mine data from documents and artifacts, and refer to printed and other materials relevant to a study, including public records, personal documents, popular culture, and popular media, visual documents, and physical artifacts (Merriam and Tisdell, 2016, p. 106). In this study, an evaluation of all the courses was the main data source ($N = 15$). The candidates often used the open categories in the evaluation surveys to elaborate on their Ph.D.-situation during the pandemic. Also, e-mails from the PhDs about their situation during the pandemic were applied. In addition, some progression reports, Ph.D. program regulations, and annual reports were analyzed and applied as part of the overall document analysis. The analysis of such documents had a more descriptive meta-perspective and was used for the initial design phase of the case study and for validation of preliminary findings from the main data sources.

Interviews

During the study's second phase, an interview guide was developed based on previous research, field dialog, online observations, document studies, and the quantitative survey from the study's first phase. A semi-structured interview approach was

chosen because it involves a certain degree of standardization while also allowing for flexibility for participants to elaborate on their experiences (Brinkmann and Kvale, 2014). Some examples of questions that were asked were: "In what ways has the pandemic impacted the completion of your Ph.D. (from March 12, 2020 until today)? Has the pandemic affected your data-gathering process (if yes, in what ways)? Have you considered ending your Ph.D. project due to the pandemic? Have you had, or are you currently, worried about your mental and physical health due to the pandemic?"

Drawing on a purposeful sampling strategy based on qualifications (e.g., discipline, gender, and teaching experience) and accessibility based on availability (Patton, 2015), six doctoral candidates ($N = 6$) were recruited to be interviewed during the 2021 spring semester (from 20.03.2021 to 10.05.2021). The interview informants were employed at five of the institutions in WNGER II and enrolled in five PhD-programs at different universities and university colleges in WNGER II. Prior to being recruited for the interviews, the PhDs had answered on the survey that they agreed to be contacted by the researchers for follow-up interviews. Due to the ongoing COVID-19 pandemic and recommendations for social distancing, all interviews were conducted remotely by one of the researchers through the virtual platform Zoom. The interviews were conducted in Norwegian and lasted between 20 and 45 min each. Although virtual platforms such as Zoom afford several benefits for conducting interviews – such as flexibility in terms of time, space, and reduced travel costs – some drawbacks also are present, including technical issues, lack of physical presence, and disruptions with turn-taking (Johnson et al., 2021; Oliffe et al., 2021).

All interviews were transcribed verbatim and translated into English. A native English speaker verified the translated transcripts. In line with the principles of member checking, transcripts were sent back to the participants for verification and confirmation to increase the interviews' credibility and trustworthiness (Carlson, 2010; Birt et al., 2016). The participants' names were anonymised and replaced with pseudonyms. Investigator triangulation ensured the results' validity and reliability (Denzin, 2009).

The interview transcripts were analyzed using thematic analysis (Braun and Clarke, 2006; Braun et al., 2019), in which strategies for coding and categorisation also were applied (Saldaña, 2016). A six-step process for conducting thematic analysis was utilized in the analytical process, as suggested by Braun and Clarke (2006, pp. 87–93). The first step involved familiarizing oneself with the data and included transcribing the interviews and reading and re-reading the transcripts to generate ideas. During the second step, the researchers started coding the transcripts for interesting features or recurring patterns. During the third step, codes were gathered and merged into potential themes or categories. During the fourth step, the researchers reviewed the themes in relation to the coded transcripts and created a thematic map. During the fifth step, theme names or labels were defined and refined. The sixth and final step involved writing up the findings while selecting interesting passages and examples from the transcripts to provide sufficient evidence of the themes from the data.

Focus Group

The selection of PhDs ($N = 11$) was based on both a purposive sample and their wish to comment on the survey’s preliminary findings as well as the findings from the interviews, through a two hour focus group interview. In collaboration with the Ph.D. coordinator at a university college in the sample, the group was selected. The first author conducted the focus group interview, with the Ph.D. coordinator as a co-moderator present at the observation site on 13th April 2021. The focus group strength is that such data collection allows for access to social interactions and how meaning is ‘negotiated’ in context, i.e., participants’ accounts need to be considered in context (Saunders et al., 2016). The focus group interviews were based on open-ended questions from the preliminary findings in the survey and interviews, and applied as a validation of the main data sources (the survey and interviews). The analysis of the focus group were inspired by thematic analysis (Braun and Clarke, 2006; Braun et al., 2019), but since this was another type of data than in the main data sources (survey and interviews), the analysis had a more descriptive meta-perspective. It was, therefore, important to use the focus group data as supplementary data sources for validation of preliminary findings from the main data sources.

RESULTS: QUANTITATIVE DATA

As seen in **Table 1**, most participants ($n = 35, 56.5\%$) reported that working from home negatively influenced their doctoral projects. Though participants, to a lesser degree, were unsatisfied with their conditions working from home, the relationship between home office influence and home office satisfaction was highly correlated ($r_s = 0.68, p < 0.001, n = 58$), indicating that participants who were happier with their home

office conditions were more likely to report positive influences working from home. Half the participants reported that the pandemic had impeded their doctoral projects ($n = 31, 50.0\%$). Most participants reported that the pandemic had necessitated alterations in their Ph.D. projects ($n = 35, 56.5\%$), and nearly a third reported that they had to make changes to their data collection ($n = 19, 30.7\%$). Participants were more evenly distributed on whether they were on track to complete their projects, and a large majority, were unlikely to leave their projects ($n = 51, 82.2\%$). Still, eight participants (12.90%) reported that they, to a large or very large extent, had considered ending their Ph.D. projects due to the pandemic.

Evidently, most participants rarely communicated with their department head ($n = 37, 59.7\%$) and Ph.D. coordinator ($n = 41, 66.1\%$) during the pandemic. Consequently, their main contact with the academic environment stemmed from their relationship with their Ph.D. supervisor. Though most participants reported that they were satisfied ($n = 33, 53.2\%$), only about a third ($n = 22, 35.4\%$) communicated with their supervisor frequently. The descriptive results further explain participants’ understanding of the most important factors to complete their project (see **Table 2**). According to the answers, the two most important factors for the Ph.D. candidates were a combination of internal features (persistence and resilience, ability to work independently) and their relationship with their supervisor (supervision and co-publishing). Together, these two factors far outweigh both ending the pandemic or returning to the faculty.

To examine the relationship between working conditions and the pandemic’s impact on the Ph.D. project and supervision, we conducted a series of correlation analyses (see **Tables 3, 4**).

Participants who reported that the COVID-19 pandemic impeded their Ph.D. project also were more likely to report

TABLE 1 | Descriptive overview: frequency and percentage.

Variable	Frequency (%)				
	Highly negative	Somewhat negative	Neutral	Somewhat positive	Highly positive
Home office influence	6 (9.70)	29 (46.80)	5 (8.10)	12 (19.40)	6 (9.70)
Home office satisfaction	11 (17.70)	16 (25.80)	4 (6.50)	18 (29.00)	12 (19.40)
Impeded	6 (9.70)	25 (40.30)	5 (8.10)	18 (29.00)	7 (11.30)
Data collection	4 (6.50)	15 (24.20)	11 (17.70)	14 (22.60)	16 (25.80)
Project	21 (33.90)	12 (19.40)	13 (21.00)	15 (24.20)	0 (0.00)
On track	5 (8.10)	15 (24.20)	23 (37.10)	11 (17.70)	5 (8.10)
Coordinator	22 (35.50)	19 (30.60)	12 (19.40)	7 (11.30)	0 (0.00)
Department	23 (37.10)	14 (22.60)	17 (27.40)	6 (9.70)	0 (0.00)
Supervisor	2 (3.20)	11 (17.70)	26 (41.90)	19 (30.60)	3 (4.80)
Supervisor satisfaction	5 (8.10)	7 (11.30)	15 (24.20)	17 (27.40)	16 (25.80)

The actual phrasing of ordinal levels can be found in supplementary material (will be provided by contacting the first author),
 Home office influence = What influence has working from home during the COVID-19 pandemic exerted on your doctoral project?

Home office satisfaction = How satisfied are you with your home office during the COVID-19 pandemic?

Impeded = To what extent has the COVID-19 pandemic impeded your doctoral project’s progress?

Data collection = To what extent has the COVID-19 pandemic led you to change your data collection for your doctoral project?

Project = To what extent has the COVID-19 pandemic led you to change other important aspects of your doctoral project?

On track = To what extent do you feel that you are on track with your doctoral project?

Coordinator = How often do you communicate with the Ph.D. coordinator/supervisor from your faculty during the pandemic?

Department = How often do you communicate with your immediate superior (human resources manager/head of the department) during the pandemic?

Supervisor = How often do you communicate with your supervisors during the pandemic?

Supervisor satisfaction = How satisfied are you with Ph.D. supervision (from your principal and co-supervisor) during the COVID-19 pandemic?

TABLE 2 | Most important factors to complete the Ph.D. project: frequency and percentage.

Factor	n	Percent	Percentage of cases
My own persistence	40	15.60	66.70
Supervision	37	14.50	61.70
My ability to work independently	33	12.90	55.00
My own resilience	24	9.40	40.00
Co-publishing with supervisors	20	7.80	33.30
Ending the COVID-19 pandemic	17	6.60	28.30
Working from the office	16	6.30	26.70
Family support	15	5.90	25.00
More time for actual dissertation work	14	5.50	23.30
Doctoral courses in the Ph.D. program	12	4.70	20.00
Doctoral courses in WNGER II	10	3.90	16.70
Less workload related to teaching	7	2.70	11.70
Working from home	6	2.30	10.00
Co-publication with other researchers	5	2.00	8.30

altering their data collection methods and their overall project. Furthermore, these participants also were more likely to report

not being on track to complete their Ph.D. projects. Interestingly, participants reporting not being on track were more likely to report that they had not considered ending their doctoral projects. Conversely, though not significant, participants who reported that the pandemic exerted a detrimental effect on their project were more likely to consider ending their doctoral projects. Generally, alterations to the data collection was positively correlated with making changes to the overall project, and both correlated negatively to being on track with the Ph.D. project. Participants who reported having care responsibilities for children under age 18 were more likely to report that the COVID-19 pandemic impeded their Ph.D. project. Positive experiences with the use of a home office and general satisfaction with the conditions of the home office were negatively, but not significantly, related to detrimental factors from the pandemic.

Participants that reported that they rarely communicated with their Ph.D. supervisor were more likely to report that the COVID-19 pandemic had impeded their Ph.D. project. Overall, more frequent communication with the Ph.D. supervisor correlated positively with supervision. Moreover, more frequent communication with the Ph.D. coordinator indicated more

TABLE 3 | Project status and contextual factors: Spearman's rank correlations.

	Children	Home office	Home office satisfaction	Impeded	Data collection	Project	On track
Home office influence	-0.02						
Home office satisfaction	0.03	0.68**					
Impeded	0.26*	-0.23	-0.23				
Data collection	0.25	-0.11	-0.11	0.40**			
Project	0.19	-0.14	-0.19	0.61**	0.39**		
On track	-0.15	0.04	-0.04	-0.35**	-0.14	-0.39**	
Quit	-0.02	-0.19	-0.18	0.20	-0.10	0.25	-0.26*

* $p \leq 0.05$, ** $p \leq 0.01$. $n = 61$.

Children = Do you have childcare responsibilities for children under age 18?

Home office influence = What influence has working from home during the COVID-19 pandemic exerted on your doctoral project?

Home office satisfaction = How satisfied are you with your home office during the COVID-19 pandemic?

Impeded = To what extent has the COVID-19 pandemic impeded your doctoral project's progress?

Data collection = To what extent has the COVID-19 pandemic led you to alter data collection methods for your doctoral project?

Project = To what extent has the COVID-19 pandemic led you to change other important aspects of your doctoral project?

On track = To what extent do you feel that you are on track with your doctoral project?

Quit = To what extent have you considered ending your doctoral project due to challenges related to the COVID-19 pandemic?

TABLE 4 | Project status and supervision: Spearman's rank correlations.

	Impeded	Data collection	Project	Coordinator	Department	Supervisor
Data collection	0.40**					
Project	0.61**	0.39**				
Coordinator	-0.22	-0.05	-0.15			
Department	-0.03	-0.24	0.15	0.31*		
Supervisor	-0.30*	-0.29*	-0.21	0.34**	0.18	
Supervisor satisfaction	-0.11	-0.23	-0.15	0.02	-0.08	0.32*

* $p \leq 0.05$, ** $p \leq 0.01$. $n = 61$.

Impeded = To what extent has the COVID-19 pandemic impeded progress on your doctoral project?

Data collection = To what extent has the COVID-19 pandemic led you to change your doctoral project's data collection methods?

Project = To what extent has the COVID-19 pandemic led you to change other important aspects of your doctoral project?

Coordinator = How often do you communicate with the Ph.D. coordinator/supervisor in your faculty during the pandemic?

Department = How often do you communicate with your immediate superior (human resources manager/head of the department) during the pandemic?

Supervisor = How often do you communicate with the supervisors during the pandemic?

Supervisor satisfaction = How satisfied are you with Ph.D. supervision (from your principal and co-supervisor) during the COVID-19 pandemic?

frequent communication with both the department head and the Ph.D. supervisor.

RESULTS: QUALITATIVE DATA

In the next section, we will first present the results from all the qualitative data sources in light of the two research questions and the qualitative interviews in **Table 5**. These qualitative data are based on respondents from all the seven institutions in WNGER II and which are enrolled in six PhD-programs at different universities and university colleges in WNGER II.

INTERVIEWS

From the thematic analysis of the transcribed interview data, we constructed themes based on the quantitative survey results. In both data sets, we developed themes related to positive and negative experiences with support during the pandemic (**Table 6**).

As shown in **Table 6**, eight themes (four positive and four negative) were constructed based on the qualitative data, including (1) good help with the doctoral studies, (2) good emotional support, (3) good administrative support, (4) good work environment, (5) lack of support in doctoral studies, (6) poor emotional support, (7) lack of administrative support and (8) poor work environment.

Theme: Good Help With Doctoral Studies

When asked about what support mechanisms were important for PhDs during the pandemic, getting help with their doctoral studies either from supervisors, administrators, colleagues, or others was a recurring topic during the interviews. Support from supervisors was emphasized in particular, as illustrated by several doctoral candidates who experienced disruptions with their data collections:

I published a review article, which was sort of due to COVID-19. It started with getting [the article] accepted for a special issue related to COVID-19. Then, it was about seizing the moment while everything was going on, especially because so many things were postponed or canceled that I had to just get working on it. My supervisor was pretty clear with me that this could be wise (Kevin).

Initially, I started with the idea of publishing an article by myself, and I progressed pretty far. However, I came to the point where I, as a new doctoral student, did not know how to proceed. That's when you need the support and knowledge that supervisors have. For me, co-publishing has been very important, not just to help me complete my project but also in terms of learning how to write articles and the discussions surrounding what we need to remember to include, such as theoretical discussions (Kyle).

Supervisor availability was another aspect that was noted as important: "A supervisor who is available and fast at responding if something came up . . . it's not like I am in touch with my

supervisor that often, but when I contact him, he is quick at responding back" (Kevin). Another doctoral candidate also supported this sentiment: "No doubt that turning on Zoom and having a chat with my supervisor has helped me extremely much" (Sue)!

Theme 2: Good Emotional Support

From the interview data, another theme that stood out was related to the PhDs' positive experiences of receiving emotional support during the pandemic. Arranging for frequent meetings with the supervisor was underscored as essential: 'My supervisor is perhaps my closest superior, and we have very often been in contact, but that could also be because I am good at asking for us to have a meeting . . . I feel that it has helped with the progress to have that kind of backing' (Sue). Another Ph.D. echoed this sentiment:

They [the supervisors] contribute so much, and we meet up quite often. Sometimes we meet every 14 days on Zoom and discuss problem statements and those kinds of things. For me, supervision is one of the most important factors to finish up, not only because I am introduced to new scholars but also because I can be surrounded by someone who (has) so many routines and knowledge about things that I can learn from (Kyle).

The same Ph.D. also mentioned feeling supported during the 'annual performance review' and that the employer sometimes called 'to check up whether everything is OK' (Kyle).

Theme 3: Good Administrative Support

Findings from the interview data that were related to receiving time compensation or in which the Ph.D. course was shifted from physical classrooms to online were classified under the third theme, 'Good administrative support.' Getting assurances from the government and the employer that time lost during the lockdown would be compensated, or 'reimbursed' (June), was an important factor: 'We have discussed the fact that if it occurs [delays in the doctoral project due to COVID-19], there are measures in place for me to apply for an extension and to make adjustments' (Kyle).

Some PhDs expressed feeling relief and experiencing fewer disruptions in their work, and that working from home forced into action a 'cut the crap' (Tammy) attitude among colleagues. Several candidates also underscored the positive aspects related to not needing to travel to attend Ph.D. courses or the availability of online courses:

There are several webinars and courses that I now could participate in without having to travel anywhere, and I experience this as extremely practical, easy and handy.... It's simply delightful (Tammy)!

Especially last spring [2020], right after lockdown, I think the digital courses were very important. I gained a lot from these pop-up seminars that were held.... Having these regular meetings (was), in fact, very important for me to keep up my motivation and at the same time have some sort of refill [of knowledge] in the phase that I was in (Kevin).

TABLE 5 | Overview of themes across the sources of data.

Overarching theme	Field dialogs		Online observations		Interviews		Focus group interviews		Document analysis		
	Main theme	Sub theme	Main theme	Sub theme	Main theme	Sub theme	Main theme	Sub theme	Main theme	Sub theme	
Frame factors	<i>Ph.D.-project</i>	<ul style="list-style-type: none"> Delays in the overall doctoral project. Delays in the data collection. Delays because of changing their research questions. Uncertainty and frustration attached to receiving time extension (or not). Challenges with no alteration of Ph.D.-regulations. 	<i>Distractions</i>	Problems with distractions in the home office situation.	<i>Lack of support in doctoral studies</i>	Supervisors became absent.	<i>Uncertainty</i>	Uncertainty around time extension.	<i>Psycho-social factors</i>	Poor emotional support from immediate superior/HR.	
		<ul style="list-style-type: none"> Delays because of changing their research questions. Uncertainty and frustration attached to receiving time extension (or not). Challenges with no alteration of Ph.D.-regulations. 	<i>Preparation</i>	<ul style="list-style-type: none"> Problem with sufficient preparation to the courses for PhD's. Problems with sufficient broad band, etc. at home offices. Problems with completing obligatory assignments in courses (e.g., caring responsibilities). Problems with attending the online-courses (e.g., sick leave, childrens' home schooling, etc.). Unfamiliar with the digital teaching setting. Problems with interactivity and learning outcome in Zoom-courses. Problems with access to databases, library services, etc. Challenges with privacy and communication in Zoom-courses (e.g., camera off, etc.). Less learning outcome in some Zoom-courses. 		<i>Poor emotional support</i>		<ul style="list-style-type: none"> Switching of roles. Critical incidents. Delayed feedback from supervisors. Social distancing and home office problematic. Isolation from colleagues and supervisors. Lack of concentration at home office (e.g., children responsibilities at home schooling, no day care spots). Missing the social aspects of meeting up with colleagues. Uncertainty and some tendency of anxiety and light depression. PhD's teaching online was time consuming as duty work. Less motivated when participating in online courses. Uncertainty around time compensation creates challenges. Lack of information from HR and department. Lack of sufficient home office equipment. More back pain and other physical problems during home office. Blurred lines between work and spare time at home office. Delays because of childcare responsibilities (home office/quarantine). Poor emotional support. Delays because of school lockdown. Some considered drop-out from Ph.D. because of psycho-social issues. 		<i>Delays</i>	<ul style="list-style-type: none"> Uncertainty around data collection. The corona-pandemic has impeded the progression in several ways. Delays because of childcare responsibilities (lockdown, home office/quarantine). Completion time is affected. Many doctoral activities cancelled (feels like being isolated). Social distancing and home office are challenging. More challenging with co-authorship in the Ph.D.-articles, collaboration, etc. during lockdown.
	<i>Publication Process</i>	<ul style="list-style-type: none"> Delays in the peer review process in the journals. Feasibility is affected. Children responsibilities gives delays in the publication process of articles. Females with children more vulnerable for publication delays. Inequality between monograph- and article based thesis because of changed frame factors. More challenging to collaborate with co-authors during lockdown. The pandemic situation has delayed the submission of their doctoral theses 	<i>Completion problems</i>		<i>Lack of administrative support</i>			<i>Isolation</i>		<i>Delays</i>	
		<ul style="list-style-type: none"> Delays in their synopsis progression. Uncertainty of the guidelines for the synopsis. 	<i>Digital challenges</i>		<i>Poor work environment</i>			<i>Collaboration</i>		<i>Supervision</i>	
		<ul style="list-style-type: none"> Some delays in the Mid-term evaluation. Cancellations of courses and general delays in the educational part. 								<i>National Ph.D.- regulations</i>	
<i>Extended summary</i>	<ul style="list-style-type: none"> Delays in the completion time and disputations. Online disputations due to corona restrictions challenging for the Ph.D.-candidates. 	<i>Learning outcome</i>									

(Continued)

TABLE 5 | (Continued)

Overarching theme	Field dialogs		Online observations		Interviews		Focus group interviews		Document analysis	
	Main theme	Sub theme	Main theme	Sub theme	Main theme	Sub theme	Main theme	Sub theme	Main theme	Sub theme
Supervision		<ul style="list-style-type: none"> • Less contact with supervisors. • Online supervision challenging. • Postponed plans with supervisors as co-authors. 							<i>Institutional Ph.D. - regulation</i>	<ul style="list-style-type: none"> • No new Ph.D.-regulations for the crisis. • No alteration of existing institutional Ph.D.-regulations. • No new Ph.D.-regulations for the crisis. • No changes in the requirement of a doctoral thesis. • The same assessment norm of thesis for committees as before the pandemic. • Pandemic affects the PhD's feasibility.
Doctoral activities		<ul style="list-style-type: none"> • Cancellations of courses and seminars because of the pandemic. • Cancellations of Ph.D.-peer gatherings. • Cancellations of research group meetings. • Cancellations of international conferences. • Cancellations of networking abroad. • Postponed midterm evaluations. • Cancellations of departments gatherings. • Cancellations of work trips (to/from work). • Cancellations of stay abroad. • Cancellations of Ph.D.-peer gatherings. • Cancellations of research group meetings. • Cancellations of international conferences. 								

TABLE 6 | Overview of themes from a thematic analysis of the interview data.

Themes illustrating positive experiences with support during COVID-19	Themes illustrating negative experiences with support during COVID-19
Theme 1. Good help with the doctoral studies	Theme 5. Lack of support in doctoral studies
Theme 2. Good emotional support	Theme 6. Poor emotional support
Theme 3. Good administrative support	Theme 7. Lack of administrative support
Theme 4. Good work environment	Theme 8. Poor work environment

Theme 4: Good Work Environment

A fourth theme constructed from the interview data related to having a good work environment. Several PhDs pointed out several benefits tied to working from home/remotely, such as having a space to go to ‘if you really need peace and quiet to read’ (Esther), or in some cases, a space where they felt more productive:

I almost think that I have had more progress, and I feel that this is a bit embarrassing from working from home. At least in relation to writing articles and my doctoral project, I have been more efficient than I would have been otherwise. I feel that I can write faster, get things done quicker and submit stuff earlier (Sue).

Another Ph.D. mentioned that her institution had facilitated a way for her to meet up online with her peers:

We have lunch on Zoom and do writing sessions, such as shut up and write, every Wednesday. Just knowing that you can log on and then there are others from your cohort there, it feels really comforting (Esther).

Theme 5: Lack of Support in Doctoral Studies

One of the most frequently recurring themes illustrating negative experiences for PhDs during COVID-19 is the lack of support in their doctoral training. Here, one Ph.D. pointed out that her supervisors became more unavailable or completely absent during the pandemic:

I actually lost a supervisor in the process. I think that if we had been able to meet up, I would perhaps not have lost him . . . If we had been able to collaborate, if I had been able to meet up with my supervisor more often instead of just talking on Zoom, we would be able to sit together and look at the data. He has two kids and works from home a lot more than me, so I am careful not to bother him. My co-supervisor also does not have so much time for me . . . My main supervisor was very supportive, as he always was, but then I felt that he had his own troubles and was not as ‘connected’ as he was before (June).

Another Ph.D. argued that at some point, she and her supervisor switched roles in terms of who was giving and receiving support:

I discovered that my supervisor simply was not doing so well due to lockdown and isolation and that the person was too much alone. My supervisor flat out told me that she felt that she was about to have a mental breakdown . . . She has been honest about it. If not, I would have started to wonder what was going on . . .

For a while, I felt that our roles were reversed, that I was cheering up my supervisor because you really want the very best for your supervisor (Esther).

Theme 6: Poor Emotional Support

The sixth theme we constructed was related to PhDs experiencing poor emotional support during the pandemic. The aspects related to this theme were juggling working from home while simultaneously taking care of kids, dealing with physical and/or mental health issues due to isolation and uncertainty, and experiencing disruptions in the doctoral project, such as cancellations of data collection, appointments, conferences and stays abroad. Two of the interviewed doctoral candidates highlighted the difficulties of caring for small children in their home offices:

In March, there were some weeks where everything was completely closed, with everyone working from home, but it was a relatively short period of time with lots of stress with a kid at home and where we both [herself and her husband] taught at the same time on Zoom (June).

Not having a daycare spot has been an issue. A blessing in disguise was that my husband was laid off during corona, so he was able to stay at home with (our) daughter while we (waited) for a daycare spot. However, it is still difficult to have a 1-year-old at home while you are trying to concentrate in the same apartment (Sue).

Another Ph.D., Tammy, noted problems with missing out on the informal day-to-day dialog when working from home:

When working digitally, it is difficult for me to have an informal dialog with other peer students where I quickly could discover whether I was missing something. For example, I was not included in some mailing lists, and it turns out that there was a weekly online coffee break. I was unaware of this, and I most likely (would have) known about it if it was physical (Tammy).

Other PhDs pointed out some negative consequences of the fact that international conferences, meetings, and stays abroad had been canceled:

The biggest challenge is that there are few travel opportunities and conferences. Had I gone to a conference, then perhaps I would have gotten published earlier. I am a part of a research school, and we are not able to meet each other even though we attend seminars, and it is not the same. The seminars are on Zoom, and it is fine, but you do not get the informal talk or the excellent food. We [the research school] were not able to travel to Iceland, and I doubt there will be any travels this year. Staying in touch with people is important!... I was supposed to go to Canada where there are scholars and a subject-disciplinary team in my field. For me, this is a lost opportunity due to the pandemic . . . I had an abstract accepted to an educational research conference, but I did not get to present it, and I did not get any feedback (June).

I was going to an international conference this fall, and when I visited their website, then there was no schedule for the conference yet like it used to be. I have planned a stay (abroad), and I am not so sure that it will be possible due to COVID-19. The stay abroad is planned for England to improve my oral English skills. I have

worked in daycare for 18 years, so I am not used to speaking in English, so it needs to be put to use again (Esther).

Beyond taking care of children at home, nearly all of the interviewed PhDs mentioned other challenges with having a home office, such as a lack of concentration and missing the social aspects of meeting up with colleagues:

It is not so easy to concentrate when you are sitting at home.... I am able to do what I must, but what I miss the most is to have access to, for instance, the library, if I need something and to just be able to go there. Now, I almost have to plan an excursion to access the library. Of course, I miss the social aspect that I have with other doctoral students. I am not able to meet those who I surround myself with and discuss day-to-day challenges (Kevin).

It has been very hard. Just to have a coffee with a colleague and have a chat – you miss the academic and social development that you are supposed to have during a workday when you are completely isolated. No doubt that I can feel it (Sue).

I feel that it has been nice to attend courses [online], but I really miss being physically present with someone to talk to about the discipline. Breakout rooms do not replace being able to sit down and talk to someone who also understands the discipline in the same way or who is in a similar discipline so that together, you explore different people's experiences with the use of different methods and so on (Tammy).

Cancelations, disruptions, or delays in the data collection process, or in doctoral training, were common negative experiences that were shared by several of the PhDs:

I had a school that said no and that we could not continue. . . . I have everything mostly collected [the data], but I am not satisfied with what I have collected. . . . There was a family that I was supposed to talk to that wanted to meet up physically, but we were not able to. I was not able to attend parent–teacher conferences at schools because they were canceled. In one of the meetings, they forgot about me because of corona (June).

I was supposed to do a pilot study in March last year [2020], but it was pushed to June. . . . It has not affected my (progress), but affected my sample and such, which is more challenging now, especially when I am researching schools and students. . . . There were fewer pilot studies than I had planned for. At some point, I started making a Plan B for my project (Kevin).

The phone is very quiet, and so far, I have only recruited two participants, which is too few.... I had hoped for at least eight. I have noticed that if I look at my progress plan that if I do not get these informants, then it will have consequences. Perhaps I will not be able to write the article that I planned (Esther).

There was a course that was eight ECTS lasting over 2 weeks. It was canceled and not offered online. So, all of a sudden, there was a gap in my calendar, which was difficult to fill just like that. For my project, what has delayed me the most in the data collection is where I had scheduled appointments. I have collected data across different schools where I have scheduled observations, and then there is lockdown or local restrictions where I have had to cancel or postpone. In sum, my project and progress (are) delayed by weeks and months (Kyle).

One Ph.D., Sue, discussed in-depth the emotional toll and negative impact that the pandemic has taken on her mental health to the point where she considered ending her doctoral project:

Feeling depressed, sad, and sorry, perhaps some anxiety, and I, in a way, feel worried and a bit shaky. Can I do this? Am I good enough? There are a lot of emotions when you are this much isolated... [quit the doctoral project?] Yes, the thought has crossed my mind, but I have not dwelled on it to the point where I have seriously considered it. But there was a time when I did not want to continue, but that feeling has passed after a while. It is difficult to sit at home. You have to handle big problems, you have plenty of feelings, you need lots of help, and you feel completely alone (Sue).

Theme 7: Lack of Administrative Support

The theme of *lack of administrative support* captures issues regarding online teaching and being offered time compensation for time lost due to the pandemic. For some, making the shift from physical to online teaching presented certain challenges, while for others, the transition was not as difficult:

I had quite a bit of teaching during the lockdown. Often, we had to be two teachers, and we used a lot of time trying to figure everything out.... Most times, it's fine, but you do not get the same relationship with your students (June).

I do not think the transition from physical to digital teaching was as big... yet, the shift gradually got bigger as you talk to blank screens where the web cameras are turned off. It does something to your motivation and involvement. I think that the further this progresses, the more demanding it gets (Kyle).

There is perhaps more to think about online when organizing breakout rooms, how to handle assignments in groups, or how to cover things in plenary. There is less flow. However, in terms of work, it is not so different (Sue).

Some PhDs brought up their worries about receiving time compensation for the impact that the pandemic had on their projects:

We had gotten back those days when we were in lockdown, but nothing beyond that. When I attempt to notify [HR] that I have experienced delays, for instance, that my data collection did not go as planned, I am told that 'we will discuss this at a later date, as we do not have any schemes in place' (June).

I have challenged them [HR] about it, but their preliminary answer is that they have noted it and that they will revisit the case. I find that challenging. It's the uncertainty, right? That is, if I do not finish, how will things turn out? I would like to have some predictability and reassurances in place (Kyle).

Theme 8: Poor Work Environment

The final theme encompasses aspects related to poor working conditions at home that were brought on by the pandemic. Most of the interviewed PhDs noted that the furniture or technical equipment in their home offices was not optimal for completing their work, and for some, the working conditions were making a negative impact on their physical health:

I notice that I have become way more passive (Esther).

I can feel it in my back. It is not chronic pain, but sometimes when I am in one sitting position a bit too long, I can feel that my chair is not optimal, nor is it adapted to be used for a full workday. I do not have a desk that can be elevated or lowered so that I can stand up for periods of time (Sue).

Maybe we do sit too much still, so I have bought different chairs for variation, and I have downloaded different apps to get moving during the day (Tammy).

Experiencing blurred lines between leisure and work due to poor working conditions was also a topic that the PhDs frequently brought up:

I can suddenly start working in the evening because it is so difficult to distinguish between the home office and home. Even though I have worked a full workday, I will start working after our daughter is asleep in the evening because there is just one more thing that needs to be done. It is difficult to distinguish between work and home when your work is at home (Sue).

Right now, I feel that there is no separation between my work and private life. Now, I work from early in the morning until 4 p.m., and then I will eat dinner before sitting down and work until late. That's how (it) goes, really. That is, there is no division between work and leisure. The biggest challenge is perhaps how to regulate when you are supposed to do what (Kevin).

I have sat at home the entire time. Of course, the home office erases the borders between work, spare time, and family, so the threshold to sit down again and stretch out the day [with work] is almost completely gone. I think that it is difficult to set boundaries (Kyle).

DISCUSSION

This case study aimed to examine these research questions:

- (1) To what extent has the COVID-19 pandemic impeded WNGER II PhDs' frame factors on the micro-level, and how do they perceive this situation?
- (2) To what extent has the COVID-19 pandemic impeded WNGER II PhDs' frame factors on the meso-level, and how do they perceive this situation?

To answer these research questions, we applied mixed-methods research, case study, and formative dialog research to examine the PhDs' experiences with the relationship between the formulation arena, the transformation arena, and the realization arena (Linde, 2012; Lindensjö and Lundgren, 2014). Concerning the first research question, *To what extent has the COVID-19 pandemic impeded WNGER II PhDs' frame factors on the micro-level, and how do they perceive this situation?*, we found that the pandemic impeded the PhDs' doctoral projects and frame factors in many ways and that most PhDs perceived these effects as significant. This is based particularly on the fact that being physically present (more or less) was not possible for these PhDs during the pandemic, i.e., they have experienced the absence of

the following in physical form: education; peer gatherings; other meetings; conferences; networking abroad; midterm evaluations; supervision; fellowship gatherings; stays abroad; data collection; work trips (to/from work); and disputations. In addition, altogether, 62% of the respondents in the survey had childcare responsibilities, where closed (pre-) schools changed the frame factors for working effectively with their Ph.D. from home offices. Several PhDs also reported other challenges with childcare, and school lockdowns, pressure in their home situations, and as well as psycho-social difficulties. A review of Ph.D. progress reports for 2020 at the host institution's main faculty also supports such findings, and the pandemic's impact on the PhDs' progress and feasibility as well as also the supervisors' progress reports for 2020 largely confirm the PhDs' reported challenges (University of Bergen [UiB], 2021).

Though the case study also found positive aspects among PhDs concerning the pandemic (some enjoyed their home offices, international online conferences, etc.), the pandemic has created several challenges and difficulties for them. Travel restrictions have led to candidates having little-established research networks, affecting both their specific research endeavors and the more long-term development of their careers. This has been particularly critical for PhDs who started their Ph.D. scholarships around March 2020 and who have been in this pandemic situation now for up to 20 months (55% of their 3-year scholarship). Some PhDs felt the need to change their research questions and design, as well as implement new data sources as a result of COVID-19 conditions. For some PhDs (12.9%), the situation has been so critical, based on their reports, that they, to a large or very large extent, had considered ending their Ph.D. projects. So, how do they cope with the situation? Survey data (from November 2020 to January 2021) showed that in light of all their difficulties, the two most important factors for the PhDs in completing their theses were a combination of internal features (persistence and resilience, ability to work independently) and their relationships with their supervisors (supervision and co-publishing). However, the follow-up field dialogs and document studies from one year later (November 2021) indicate that the long-lasting pandemic, to a certain degree, seems to have changed the PhD's perception of such issues reported in the survey and where psycho-social problems seem to have gradually increased, especially during the last year of the pandemic. Partly, this might be related to the fact that a large proportion of PhDs in WNGER II have childcare responsibilities. Field dialogs indicate that female WNGER II-fellows with children seem to have more childcare, household, and other responsibilities during lockdowns, including homeschooling, own children in quarantines, etc. It also seems related to general pandemic fatigue where this long-lasting disaster with restrictions, quarantines, insecurity, isolation, stress, etc., has contributed to changing the frame factors for their feasibility, for some of the PhDs a disbelief in completing their own doctoral project and for some a disbelief in their future job opportunities. Especially, their worries are attached to delays in completing their articles, completing their training component, and completing their extended summary (the synopsis) within their scholarship

period, when much uncertainty and delays have changed their frame factors for completing their doctoral thesis.

Concerning the second research question, *To what extent has the COVID-19 pandemic impeded WNGER II PhDs frame factors on the meso-level, and how do they perceive this situation?*, the Ph.D. programs and the other research schools at the host institutions' main faculty reported that several planned courses were canceled or postponed in 2020 due to COVID-19, which created challenges for PhDs (University of Bergen [UiB], 2021). Field dialogs indicate that all the seven WNGER II institutions had similar cancelations of courses during the pandemic. Other findings related to psycho-social aspects revealed that most of the PhDs in WNGER II rarely or very rarely communicated with their Ph.D. coordinators and their immediate superiors (department heads) during the pandemic and that most had not discussed any challenges to the progress of their doctoral projects due to the COVID-19 pandemic with their immediate superiors (department heads). Some of the PhDs reported that they 'lost' their supervisors during the pandemic or that they needed to support their supervisors (who obviously were struggling) due to pandemic conditions. The case study also indicated that the PhDs' institutions had accommodated them to various degrees when it came to compensating for the loss of progress due to the COVID-19 pandemic. Moreover, we observed that the pandemic has led to changes in other important parts of their doctoral projects, with field dialogs indicating that this also is related to delays in the publication process for articles and delayed submission of their doctoral theses for different reasons. Longer review time in scientific journals because of the pandemic has been a problem for quite many PhDs in WNGER II. Some candidates in certain Ph.D. programs experienced delays that gave further consequences because their Ph.D. regulations at their institutions require that two out of three articles must be accepted by a scientific journal before they can submit their theses to the faculty and doctoral committee for final assessment. However, for the PhDs who wrote a doctoral monograph thesis at the same Ph.D.-program, this was not a problem since there are no requirements of published articles in this kind of doctoral thesis, and they will therefore not experience delays because of such issues. This seems to be an example of the need for adjustments of institutional regulations since it creates an inevitable inequality (because of delays in the publication process in the journals) between those who write doctoral monographs and those who write an article-based thesis. Such delays are mostly a problem for PhDs writing an article-based thesis, but they also are problematic for their institutions. For example, in the host institution's (UiB) Annual Educational Report for 2020, we found that 30% of the total amount of publications were single- or co-authored by PhDs (University of Bergen [UiB], 2021). This has been stable since 2011 and indicates that the high number of PhDs writing article-based theses comprises a significant amount of the total publication rate at the universities and university colleges in WNGER II. On a more general level, it seems like the delays that the candidates have experienced in 2020 and 2021 will affect many remaining PhDs' progress. At the host institution, the main faculty in WNGER II have experienced a decrease (19%) in disputations in 2020, citing that this "... is probably related

to the impact of the pandemic" (University of Bergen [UiB], 2021, p. 30) and nationally preliminary findings show a decrease in the national number of disputations in Norway in 2021 (Forskerforum, 2022). So, what kinds of measures have faculties and Ph.D. programs in the WNGER II-institutions implemented (meso-level) to support and help PhDs with their situations? First, the field dialogs and document studies found that when it comes to redesigning Ph.D. courses for the online format (with Zoom, etc.), a formidable effort has been made to achieve this. Second, most of the PhDs received some time extensions (mostly one month) to compensate for delays in their Ph.D. progress because of the pandemic. Third, some institutions and Ph.D. programs have tried to deal with the fact that a certain number of candidates have experienced mental health challenges due to the pandemic, affecting their Ph.D. progress, loneliness, etc. This has been addressed by increasing social activity in the Ph.D. groups (online coffee breaks, etc.) and Ph.D. gatherings (e.g., holding more seminars, etc.), as well as offering stress-reduction courses.

CONCLUSION

Viewed as a whole, we found that the frame factors attached to the COVID-19 pandemic have impeded WNGER II PhDs' doctoral projects to a large extent on both the micro- and meso-levels, and that the Ph.D. candidates in the study perceive this situation as challenging and difficult. Our findings are based on a longitudinal, explorative case study where we executed an excessive cumulative data collection process and analysis from March 12, 2020 to November 30, 2021. This cumulative process with different data sources and the long period of time (app. 20 months) allowed us to confirm our interpretations along the way and detect contrary evidence over a quite long period of time (Creswell and Guetterman, 2021). In the case study based on Mixed Method Research we found mostly *confirmation and expansion*, but also some minor tendencies of *discordance* between the qualitative and quantitative findings. The primary objective with executing an intrinsic case study where fulfilled, but the findings has also a contribution as an instrumental case study since the findings also gave us insights into some new, unresearched phenomenon.

The study shows that most of the PhDs in WNGER II are satisfied with the educational quality concerning digital teaching and supervision (micro-level) but have experienced several research-related and psycho-social challenges during the pandemic, which have affected their feasibility. And even if the WNGER II PhDs experienced support during the pandemic, it seems like incremental measures (e.g., compensation for time loss) have been provided and is important but are not sufficient in the long run. This is partly related to the high complexity of frame factors that have changed some of the underlying premises for doctoral education during the pandemic and where PhDs' feasibility has been affected on several levels. To illustrate this, we can see that the regulations for Ph.D. scholarships and Ph.D. regulations are designed under normal educational conditions with normal social conditions under which the new national Ph.D. regulations were implemented before the pandemic in

2018. On both national and institutional levels, our study shows that it seems like no semi-structural or fundamental changes have been made to these regulations for these extraordinary pandemic conditions – even though they have lasted for two years running. This has been particularly critical for those PhDs who have been in this slow-motion disaster for up to 20 months (55% of their 3-year scholarship), with a lot of uncertainty, delays, and stress over a long period of time. Based on our survey data, it seems like more regular dialog with employees (department heads) should be implemented more systematically and clearly during a pandemic because the immediate superior (not the supervisor) has the formal HR responsibility for PhDs as employees. This could have helped the Ph.D. candidates in many ways but also helped with the supervisors' extra-large workloads during the pandemic (since some of them filled the roles as both supervisors and "immediate superior" during the pandemic).

We also see that other frame factors that before the pandemic was unproblematic need more awareness. Especially, we could see that delays in the reviewing process in scientific journals affected the publication process for articles, the PhDs' feasibility, and sometimes delayed submission of their doctoral theses. This also created unequal conditions between those who wrote an article-based thesis and those who wrote a doctoral monograph thesis in the same Ph.D.-program, where only the first group was affected by the delayed publication process. Therefore, the case study indicates that it is more important than ever to understand the distinction between incremental, semi-structural changes and fundamental changes in Ph.D. regulations and guidelines when societal crises like pandemics occur. For the case study found that Ph.D. guidelines, regulations, and assessment norms seem to have remained stable while such a societal crisis occurs and that there seems to be room for improvement when it comes to crisis preparedness at the doctoral level. In particular, this seems important on the meso-level (transformation arena), in which those who are immediate superiors of PhDs (department heads, HR personnel, etc.) need to be far more involved from the start if a new pandemic occurs in the future.

Although the long-term consequences are not yet visible in our study, the field dialogs and document studies indicated that the current pandemic situation would leave a negative mark in the long run. Delays that the candidates have experienced in 2020 and 2021 probably will propagate in the remaining Ph.D. progression for some PhDs, and it seems like far more candidates will spend longer than the three years standardized for their Ph.D. scholarship. This might contribute to a lower number of Ph.D. degrees obtained in the coming years. As a result, we found that the extraordinary situation that the pandemic has elicited adds a new layer of frame factors when one talks about education quality, study quality, and teaching quality, and the case study found that the pandemic has created a larger gap at the Ph.D. level between the formulation arena, the transformation arena and the realization arena (Linde, 2012; Lindensjö and Lundgren, 2014) than before the pandemic. This gap is particularly visible on the national and institutional/program levels based on the fact that there have been no semi-structural or fundamental adjustments (other than time extensions) made to Ph.D. regulations during the pandemic that takes into account this extraordinary situation.

While another part of higher education has made adjustments in the transformation- and realization arena of e.g., exam regulations and implemented home exams because of the pandemic situation, and lower- and upper secondary school in Norway have canceled all the annual national exams the last 3 years due to COVID-19, national- and institutional Ph.D.-regulations remained unchanged. In light of the frame factor theory, one can see that the doctoral educational system on a doctoral level as a target-, -system, and legal system established before the pandemic (Kunnskapsdepartementet, 2018) remained more or less unchanged even if long-lasting unforeseen societal crisis made a big impact on the PhDs frame factors for their feasibility and doctoral progression. Seen as a whole, it is reasonable to claim that these frame factors and the unchanged regulations have reduced the PhDs feasibility and, for some, increased the completion time. How this will affect the completion rate is too early to conclude, but preliminary findings show a decrease in the national number of disputations in Norway in 2021 (Forskerforum, 2022), and the field dialogs in this study indicate that the completion time is affected by these changed frame factors during the pandemic. Especially, it had been natural to address such extensive changes of frame factors in the transformation arena (micro central level) already during the first months of the pandemic (spring, 2020). This is based on the fact that the institutions and faculties (transformation arena) have high autonomy to make necessary changes in their Ph.D.-programs during a long-lasting societal crisis like a pandemic. Therefore, to reduce this gap and strengthen the feasibility of the PhDs, the institutions need to be better prepared to better cope with a demanding situation both on micro- and meso-levels the next time a similar societal crisis occurs.

LIMITATIONS

The methodological approach has tried to take into account that most of the workplace-related dimensions have been replaced by home offices, remote teaching, and social distancing over long periods of time. The PhDs never before have experienced the consequences of such home office use and remote teaching over such a long period of time – neither professionally, socially, nor existentially. This situation creates several methodological and ethical challenges and limitations; therefore, we based our study on different types of data with unequal quality and 'best evidence at the time.' The major data sources comprise survey and interview data of high quality. Data from field dialogs, document analysis, focus groups, and observations are supplementary data sources with sufficient quality, which (because of space) mostly are applied to validate and discuss the findings from the survey and interviews. This, of course, also has several limitations because these have been collected through a formative dialog process during a societal crisis. Therefore, this study has a trait of formative dialog research (Baklien, 2004) in which reflexivity and researcher bias in particular need to be considered (Maxwell, 2005) since the data collection has met a number of obstacles caused by the pandemic.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article, further inquiries can be directed to the corresponding author.

AUTHOR CONTRIBUTIONS

RK: in charge for all process, research idea, and design of the work, generating data, analysis and interpretation of the data, main writer of the manuscript, and provided ethical approval for publication of the content. ØS: substantial contributions to the design of the work, generating survey data, analysis

and interpretation of the quantitative data, and provided important contributions to the final manuscript. FR: substantial contributions to the interviews and collected qualitative data and analyzing it. SS and KH: revise critically for important intellectual content and provided important contributions to the final manuscript. All authors contributed to the article and approved the submitted version.

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