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Teacher well-being in change: a quantitative analysis of schoolteachers' approaches to teaching and their teaching-related well-being during rapid shift in their work environment

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ABSTRACT

Pedagogical training often aims to solicit changes in teachers' pedagogical behaviour. However, previous studies have demonstrated that these endeavours are time-consuming and challenging. In the present study, we used the opportunity created by the COVID-19 pandemic to investigate how comprehensive schoolteachers' approaches to teaching change in response to rapid contextual changes and how these changes in teaching behaviour are connected to teachers' teaching-related well-being. Quantitative data were collected from schoolteachers in one Finnish municipality ($N = 116$). The results indicate that changes in pedagogical behaviour challenge teaching-related well-being, implying that teacher well-being is an important aspect to consider in teacher education and pedagogical training. Furthermore, the results demonstrate a high level of intrapersonal contextual variation in approaches to teaching, highlighting the importance of contextual perspectives in future investigations of teachers' pedagogical behaviour.

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KEYWORDS
Approaches to teaching; teacher well-being; context-sensitivity of teaching; comprehensive school; pedagogical development

Introduction

Research on teaching often have focussed on investigating teachers' teaching behaviour either in a specific context (e.g., Seidel et al., 2011; Thommen et al., 2022) or on how they teach in general (e.g., Harmsen et al., 2018; Postareff & Lindblom-Ylänne, 2008). Less is known about teaching behaviour's stability when the teaching context changes. Such change is an interesting research topic because change often is a desired outcome. For example, teacher education and professional development interventions aim to create change in teachers' pedagogical behaviour. Research have found that low levels of teacher well-being are hindering teachers' professional development and pedagogical change. However, there is a lack of evidence on how changes in teaching behaviour are related to teachers' teaching-related well-being. Therefore, the present study investigates primary schoolteachers' approaches to teaching in two contexts, face-to-face and online, and aims to understand how contextual change manifests in teaching behaviour and how these changes are related to teachers' teaching-related well-being.

Typically, pedagogical changes are long-term efforts because changing the teaching-learning environment is challenging and takes time (e.g., Ilie et al., 2020). However, this was not the case during the COVID-19 pandemic, which forced teachers to shift and adapt rapidly to online

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teaching fully and make vast changes in their teaching practices (e.g., Carrillo & Flores, 2020; Mankki & Räihä, 2022). The change was not only for enthusiastic professional developers, but also for all teachers. The present study does not address teaching during the pandemic directly. Instead, we use this opportunity to understand how primary schoolteachers responded to such a rapid contextual change through their approaches to teaching.

Studies already have demonstrated that rapid adaptation to online teaching challenges teachers' teaching-related well-being (Hodges & Fowler, 2020; Postareff et al., 2021). The pandemic challenged teacher well-being in two ways: Online teaching forced rapid changes in pedagogical behaviour, and remote work minimised social interaction within the teacher community. First, the pedagogical change from face-to-face to the online environment caused teachers to worry about their own pedagogical behaviour, as well as about their students' learning. For example, teachers experienced a lack of authentic interaction and connectedness with their students, and they were concerned about their students' welfare (Bao, 2020; Schmidt-Crawford et al., 2021). Also, teachers experienced a lack of confidence in online teaching and worried about their students' online learning habits (Hascher et al., 2021; Putri et al., 2020). These challenges increased teachers' anxiety and stress, and – moreover – led to intentions to leave the profession (Schmidt-Crawford et al., 2021). Second, the change from on-site to remote work decreased collegial support from the teacher community. Generally, situations in which teaching demands exceed teachers' personal resources provoke stress (Bakker et al., 2007). These personal resources include various aspects, such as collegial support (Hascher et al., 2021; Kim et al., 2022; Saloviita & Pakarinen, 2021). In this vein, social interaction's role within the teacher community can be viewed as central to teachers' teaching-related well-being (Kim et al., 2022).

The present study takes the rapid change from face-to-face to online teaching as an interesting avenue to investigate how primary schoolteachers respond to major pedagogical changes. As previous research has indicated that such changes are highly connected to teachers' teaching-related well-being, what happens when teachers experience sudden changes in their work environment is important to understand, both in terms of teaching behaviour and teacher community, and how these changes are related to their teaching-related well-being.

Theoretical background

Approaches to teaching

Since the late 1990s, researchers have been investigating teaching behaviour through approaches to teaching. This research trend has been prominent particularly at the higher education level, but approaches to teaching also have been investigated in the secondary education context (e.g., Beausaert et al., 2013; Lam & Kember, 2006). An approach to teaching can be defined as a combination of teachers' intentions or aims concerning their teaching and the instructional strategies that they adopt to reach their teaching goals (Trigwell & Prosser, 1996). Traditionally, approaches to teaching have been examined through a dichotomic categorisation between learning-focussed and content-focussed approaches to teaching. The learning-focussed approach, also referred to as a student-centred or student-focussed approach, aims to engage students in an active and reflective learning process by fostering discussion and other interactive learning processes (Postareff & Lindblom-Ylänne, 2008; Trigwell & Prosser, 2004). However, the content-focussed approach focusses on the teacher's information transmission and students' unreflective and passive reception of it (Kember & Kwan, 2000; Trigwell & Prosser, 2004).

Studies drawing on qualitative approaches have emphasised the need to reach beyond the dichotomic distinction between the learning- and content-focussed approaches, and to broaden understanding of teachers' teaching behaviour (Meyer & Eley, 2006; Stes & Van Petegem, 2014). Recently, by utilising results from in-depth interviews of nearly 100 higher education teachers (Postareff & Lindblom-Ylänne, 2008), a new quantitative instrument has been developed to measure the broader scope of approaches to teaching. The *Higher Education Approaches to*

Teaching (HEAT) instrument (Postareff et al., 2023) has been validated among higher education teachers and comprises four dimensions that examine approaches to teaching. The *Interactive approach* and *Transmissive approach* share similar items as previously developed questionnaires (ATI; Trigwell & Prosser, 2004 and ATI-R; Trigwell et al., 2005). The Interactive approach concerns how the teacher aims to promote student learning through discussion and interaction, while the Transmissive approach focusses on delivering the teacher's knowledge and information about the content that students are studying. The *Unreflective approach* mirrors the teacher's inability or uncertainty related to understanding students' learning processes and how the teacher could facilitate students' learning processes. The *Organised approach* concerns investing time and effort into teaching, as well as being organised and systematic as a teacher. Recent studies have demonstrated that the dimensions are not mutually exclusive and can appear in various combinations (Ilie et al., 2024; Stes & Van Petegem, 2014).

Evidence on how teaching context influences teachers' approaches to teaching is scarce, though some studies in the higher education context have emphasised disciplinary differences. The results are somewhat contradictory, but it seems that the content-focussed approach is more stable across contexts, and the learning-focussed approach is more sensitive to contextual variation (e.g., Lindblom-Ylänne et al., 2006; Stes et al., 2008). Approaches to teaching also have been examined to some extent in online contexts. The results have demonstrated that similar approaches to teaching can be detected in both face-to-face and online contexts. For example, in an interview study, González (2012) identified approaches to e-teaching that ranged from information-focussed approaches (providing easy access to course materials) to communication/knowledge-building-focussed approaches (i.e., engaging students in deep thinking through online discussions to provide an online space for knowledge building) that closely resemble the content-focussed and learning-focussed approaches identified in the classroom context. Another study investigating approaches to teaching in a fully online context indicated that in addition to focussing on content acquisition or knowledge building, an approach addressing collaborative learning also was identified (Badia et al., 2017). However, research on how approaches to teaching vary between different contexts and learning environments remains very limited.

Teaching-related well-being

In the present study, teaching-related well-being was investigated through the concepts of stress, burnout and self-efficacy. Teaching-related stress can be defined as experiencing unpleasant emotions resulting from teachers' work (see e.g., Skaalvik & Skaalvik, 2017). Short-term stress is typical in any profession, but prolonged stress is a risk factor in teacher burnout (Maslach et al., 2001; Mäkikangas et al., 2021). Overall, stressful experiences are typical among teachers, and teaching has been characterised as a stressful profession (Aloe et al., 2014; Skaalvik & Skaalvik, 2015, 2017). The level of teachers' stress has been demonstrated to vary from moderate to high, and a significant number of teachers suffer from extremely high stress levels (Gillespie et al., 2001). Stress can result in worry and tension, as well as lack of pleasure and commitment to the job (Helms-Lorenz & Maulana, 2016). Teachers' stress is often caused by contextual factors, such as lack of social support, heavy workload and insufficient leadership (e.g., Gillespie et al., 2001).

Teaching-related burnout comprises three dimensions: emotional exhaustion, cynicism, and professional inadequacy (e.g., Maslach et al., 2001; Pietarinen et al., 2013). The present study focusses on investigating the exhaustion and cynicism dimensions because previous research indicates that they are the core symptoms of burnout, particularly teachers' burnout (Pietarinen et al., 2013). Emotional exhaustion is often the primary symptom of burnout, typically caused by a heavy workload. Emotional exhaustion refers to a feeling of chronic fatigue and depletion of emotional resources (Maslach et al., 2001). Cynicism can be defined as a feeling of losing interest in one's job and feelings of irritability, including negative and detached approaches towards others (Maslach et al., 2001). Overall, burnout is linked to a decreased ability to work (Hakanen et al., 2006). Social factors in

the workplace, such as interpersonal conflicts and lack of support, influence the process leading to burnout, (Maslach, 2003). These aspects in particular influence people whose work entails providing support to other people, such as teachers (Skaalvik & Skaalvik, 2017). Recent studies indicate that teachers' well-being decreased during the pandemic, amid omnipresent online teaching (Postareff et al., 2021; Salmela-Aro et al., 2020). Another interesting study found that teachers who experience burnout symptoms still can be engaged in their work (Salmela-Aro et al., 2019).

Self-efficacy refers to one's perception of their capability to complete daily tasks (Bandura, 1997). Teaching-related self-efficacy refers to teachers' beliefs about their ability to engage with their students in active learning processes (Temiz & Topcu, 2013) through planning and organising their teaching to reach their educational goals (Skaalvik & Skaalvik, 2010). Teachers with high self-efficacy levels are open to new ideas, e.g., adopting innovative teaching methods (Hoy & Spero, 2005). Furthermore, they are more likely to feel engaged with their students and more satisfied with their jobs (Granziera & Perera, 2019). Teachers' self-efficacy also is related to their motivation and persistence to continue when facing obstacles (Bandura, 2000; Glackin & Hohenstein, 2018). In one recent study, teachers reported lower self-efficacy from online teaching during the pandemic than typical face-to-face teaching (Postareff et al., 2021). Another study found that teachers' self-efficacy was low at the beginning of online teaching during the pandemic, with teachers reporting that online teaching separated them from their students and made it challenging to detect students' understanding and provide instant feedback (Ma et al., 2021). However, self-efficacy for technology application increased among other teachers as the pandemic continued (Ma et al., 2021).

When investigating these three concepts jointly, previous research has found that weak self-efficacy beliefs are linked to teacher burnout in a way that suggests weak self-efficacy causes burnout, and burnout further weakens self-efficacy (Skaalvik & Skaalvik, 2010). However, strong self-efficacy may protect teachers from stress and burnout because it has been demonstrated that strong self-efficacy enables teachers to view sources of stress as challenges that they can overcome, instead of experiencing them as hindrances (Han et al., 2020). A study among subject teachers indicated that having personal resources, such as control and resilience, seemed to protect teachers from burnout, while job demands such as heavy workloads were connected to teacher burnout (Salmela-Aro et al., 2019). Therefore, teachers should have the tools to cope with challenging situations and adopt strategies to cope with stress and burnout (Pyhältö et al., 2021; Roeser et al., 2013). Extant studies on connections between teaching behaviour and teacher well-being are limited (e.g., Cao et al., 2018). Teaching context (face-to-face vs. online; Postareff et al., 2021) has been demonstrated to be related to teachers' well-being. Moreover, previous studies have demonstrated that teachers' pedagogical competence and well-being are connected (Lauermann & König, 2016). Thus, the present study investigates the relations between teachers' well-being and their approaches to teaching in different contexts. The hypothesis is that sudden changes in teaching contexts are likely to challenge not only teachers' teaching behaviour, but also their well-being.

Aims and research question

Typically, changing teachers' teaching behaviour is a long-term endeavour. The sudden, pandemic-driven, compulsory contextual shift from typical face-to-face teaching to fully online teaching offered an interesting opportunity to investigate both the context-sensitivity of approaches to teaching, as well as how changes in approaches to teaching are related to teaching-related well-being.

The present study utilised this opportunity through a case study of teachers in one Finnish municipality who reflected their teaching in both face-to-face and online contexts. The first research aim was to provide an overall understanding of the relations between approaches to teaching and teaching-related well-being. The first research question was:

1. How are teachers' approaches to teaching and teaching-related well-being connected?

The present study's second aim was to understand how changes in teachers' approaches to teaching are related to their teaching-related well-being. This was addressed through the following research questions:

1. What kind of teacher profiles can be found based on differences in their approaches to teaching in face-to-face and online contexts?
2. How do these teacher profiles differ in their teaching-related well-being?

Methods

Context

The study was conducted in the Finnish comprehensive school context, encompassing both primary education (Grades 1–6) and lower secondary education (Grades 7–9), comprising students ages 7–16. According to Finnish educational standards, qualified teachers must have a five-year university master's degree. Teachers have substantial autonomy to leverage their professional expertise when translating curriculum content into meaningful classroom practices (Erss et al., 2016). Moreover, teachers actively participate in curriculum development to enhance their ownership of the national curriculum (Haapaniemi et al., 2021). In March 2020, the pandemic forced a rapid transition to online teaching within two days. Subsequently, throughout the spring term, teaching predominantly took place in the online environment. However, by the time of the data collection in autumn 2020, teaching had returned to face-to-face settings.

Data collection

The data were collected in autumn 2020 from comprehensive schoolteachers working in a medium-sized municipality's (approximately 20,000 inhabitants) four schools in Finland. As part of their joint professional development session, the teachers completed an electronic questionnaire and provided active consent to participate in this study. The session was held online, and the authors attended the session to introduce the questionnaire and answer any possible questions that teachers might have had while responding. The questionnaire comprised scales measuring teachers' approaches to teaching and their experiences with stress, burnout and self-efficacy through five-point Likert-scale items (1 = completely disagree, 5 = completely agree). During the professional development session, responses to the items were elicited twice: First, the teachers were directed to reflect on their face-to-face teaching in general, then revisit the same set of items from the perspective of online teaching during the pandemic.

The questionnaire items are presented in Table 1. Teachers' approaches to teaching were measured through the HEAT questionnaire (Postareff et al., 2023), in which approaches to teaching are measured using four dimensions, namely Interactive approach, Transmissive approach, Unreflective approach, and Organised approach. The items have been developed based on the Approaches to Teaching Inventory (ATI; Trigwell & Prosser, 2004) and a large sample of teachers' in-depth interviews (Postareff & Lindblom-Ylänne, 2008). As the HEAT questionnaire originally was developed for a higher education context, the wording of some of the items was modified slightly to better fit the comprehensive school context. For example, "student" was changed to "pupil". The experiences of teaching-related well-being were examined through the concepts of stress, burnout and self-efficacy. Stress was measured through three items, the first of which serves as a single measure of stress (Elo et al., 2003). The two other items were introduced to provide insights into stress in teaching-specific situations. The items measuring the risk of burnout originated from the School Burnout Inventory (SBI; Salmela-Aro et al., 2009) and were tailored to fit the teaching context. As for the risk of burnout, only the exhaustion and cynicism dimensions were used because their role is the most central in teacher burnout (Pietarinen et al., 2013). The

Table 1. The scales, factors, and items in the questionnaire.

Scale	Factor	Item
Approaches to teaching	Interactive approach	In my face-to-face/online teaching, I create situations where I encourage pupils to discuss their thoughts and opinions about the topic.
		In my face-to-face/online teaching, I set aside teaching time so that the pupils can discuss among themselves about the key concepts of the subject.
		In face-to-face/online teaching situations, I provide an opportunity for pupils to deepen their understanding about the subject through discussion.
	Transmissive approach	The majority of my face-to-face/online teaching time is spent transmitting information to the pupils about the topic.
		My face-to-face/online teaching is focussed on the good presentation of information to the pupils.
		The most important goal of my face-to-face/online teaching is to deliver what I know to the pupils.
	Unreflective approach	I have trouble understanding how I can help the pupils learn in face-to-face/online teaching situations.
		The pupils' learning process is so complicated that it is challenging for me to understand how I can support it as a teacher in face-to-face/online teaching situations.
		It is difficult for me to understand what learning is all about.
	Organised approach	I am organised and systematic as a teacher.
		I put a lot of effort into my face-to-face/online teaching.
		I spend a lot of time to prepare my face-to-face/online teaching.
Stress		Stress means a situation in which a person feels tense, restless, nervous, or anxious or is unable to sleep at night because his/her mind is troubled all the time. I continuously feel this kind of stress.
		I feel the kind of stress mentioned above in face-to-face/online teaching situations.
		The kind of stress mentioned above has a negative effect on my face-to-face/online teaching.
Burnout	Exhaustion	I feel overwhelmed by work related to face-to-face/online teaching.
		I often sleep badly because of matters related to my face-to-face/online teaching.
		I brood over matters related to my face-to-face/online teaching a lot during my free time.
		In face-to-face/online teaching situations, the pressure of my teaching causes problems in my close relationships with others.
	Cynicism	I feel a lack of motivation when I am teaching, and face-to-face/online teaching situations make me consider alternative career paths.
		In face-to-face/online teaching situations, I feel that I am losing interest in my teaching.
		I am continually wondering whether my face-to-face/online teaching has any meaning.
Self-efficacy		I believe I can cope with my teaching tasks in face-to-face/online teaching situations.
		I am confident that I can manage even in the most difficult face-to-face/online teaching situations.
		I am certain, that I have the necessary pedagogical skills to manage in face-to-face/online teaching tasks.
		I am confident that the students learn from my face-to-face/online teaching.

self-efficacy items were adapted from the Motivated Strategies for Learning Questionnaire and contextualised to the teaching context (MSLQ; Pintrich et al., 1991; Postareff et al., 2023).

Participants

Altogether, 127 teachers answered the questionnaire (response rate 85%). After excluding teachers who either withheld their consent or left complete scales unanswered, the final sample comprised 116 teachers. The participants' background variables are presented in Table 2. A notable demographic feature within the sample was the predominance of women (77% of the participants).

Table 2. Summary of the background variables on the participants ($N = 116$).

Background variable	%	Background variable
Gender	Woman	77.6
	Man	15.5
	N/A	6.9
Age	25–34 years	22.4
	35–44 years	34.5
	45–54 years	25.9
	55+ years	17.2
Teaching experience	< 1 year	2.6
	1–5 years	19.8
	> 5 and < 10 years	19.8
	10+ years	56.9
Teacher position	Class teacher	46.6
	Subject teacher	41.4
	Special education teacher	11.2
	Other	3.4
Pedagogical qualification	Yes	97.4
	No	2.6

This aligns with the established gender distribution among teachers in Finnish schools (Finnish National Agency for Education, 2020). In terms of age, 35 percent of the participants fell within the 35–44 age bracket, and the remaining teachers were relatively evenly distributed across the age groups of 25–34, 45–54, and 55+ years. Over half the participants (57%) had over a decade of teaching experience, while a smaller fraction (approximately 10%) reported less than two years of teaching experience. Diverse teaching positions were observed within the participants, with 47% serving as classroom teachers, 41% as subject teachers and 11% as special education teachers. With a few exceptions, the subject teachers were primarily responsible for teaching Grades 7–9 in secondary school, while others undertook the responsibility of teaching one or more grades (1–6) in elementary school. Almost all participants (97%) held a pedagogical qualification.

Data analysis

The data were analysed using IBM SPSS Statistics 26 software. First, six teachers who did not consent to participate in the study were removed from the data. The dataset then was screened for repetitive response patterns and missing values, with five teachers who disengaged from answering the questionnaire also removed, leaving the aforementioned final total of $N = 116$. The data contained under .5 percent of missing values and based on Little's MRAR test (Little, 1988), these data were missing completely at random. The items' normality was assessed through skewness and kurtosis: A few items did not meet the 1.96 cut-off level and slightly violated the normality assumption. Multicollinearity was assessed through both the bivariate correlations (Spearman) and variance inflation factor.

The sample size was not sufficient to conduct a confirmatory factor analysis, so the factor structure was analysed using an exploratory factor analysis procedure (principal axis factoring and direct oblimin rotation). Exploratory factor analysis is a statistical procedure used to extract factors from a collection of items, enabling investigation of latent variables that cannot be measured directly. A principal axis factoring was chosen as the extraction method because it is more robust with small sample sizes and slightly non-normal data than the maximum likelihood estimation (Fabrigar et al., 1999). Principal axis factoring was accompanied by direct oblimin rotation. An oblique rotation was chosen over orthogonal rotation, as there was no reason to assume that the latent factors were linearly independent. With the small number of missing values, the factor analysis was conducted with listwise deletion. The proposed factor structure was investigated through item communalities and factor loadings, and the factor structure was as reported in the literature (Postareff et al., 2023), explaining over 50 percent of the variance within all scales. All factors were checked for

internal consistency using Cronbach's alphas. These results are presented in Table 3. Although the internal consistency values were moderate with the transmissive approach in both face-to-face and online contexts, and for the unreflective approach in the online context, the factors still demonstrated strong construct validity, aligning with previous literature (Postareff et al., 2023) and correlating substantially with the other investigated related factors (see Table 4). The factor score was computed as a mean of its items.

As the data slightly violated the normality assumption, the association between teachers' approaches to teaching and teaching-related well-being was investigated using nonparametric, two-tailed bivariate correlations (Spearman). The Spearman correlations can be interpreted as .1 for small, .4 for medium, and .7 for large dependence between the ranks of the two variables. With the sample size limiting the number of variables included in the cluster analysis, the context-sensitivity in the teachers' approaches to teaching was investigated by computing new variables as the difference between the score in face-to-face and online teaching. This was done for the interactive, transmissive, unreflective and organised approaches to teaching factors. These four new variables indicating changes in the teachers' approaches to teaching dimensions were used in clustering the teachers. Cluster analysis refers to a set of statistical procedures used to create subgroups of cases in a way that the cases are similar to cases within the same cluster and different from cases outside of the cluster. The dendrogram (see Figure 1) produced in the hierarchical cluster analysis based on squared Euclidian distance with Ward linkage was used to identify number of clusters, and K-means clustering was used to identify cluster membership.

Some of the factors slightly violated the normality assumption, so nonparametric tests were used in the subsequent analyses. The chi-squared test was used to analyse the clusters in relation to the reported background variables (gender, age, teaching experience, type of teacher position [classroom, subject, special education] and pedagogical qualification). The Kruskal-Wallis with *post hoc* test and Bonferroni correction was used to compare the clusters in one context, and the related-samples Wilcoxon signed rank test was used to compare the teaching contexts within a teacher cluster. Eta-squared statistics were computed for both the Kruskal-Wallis and Wilcoxon tests

Table 3. The Cronbach's alphas and means with standard deviations for the investigated factors in both face-to-face and online contexts.

			Cronbach's alpha		Mean	
Scale	Factor	No of items	Face-to-face	Online	Face-to-face	Online
Approaches to teaching	Interactive approach	3	.714	.804	3.70 (SD = .75)	2.68 (SD = .88)
	Transmissive approach	3	.657	.695	2.72 (SD = .74)	3.14 (SD = .84)
	Unreflective approach	3	.705	.648	1.54 (SD = .55)	2.27 (SD = .74)
	Organised approach	3	.754	.796	3.87 (SD = .67)	4.25 (SD = .67)
Approaches to teaching	Exhaustion	4	.788	.822	2.21 (SD = .80)	2.91 (SD = .97)
	Cynicism	3	.785	.852	1.66 (SD = .79)	2.40 (SD = 1.01)
Teaching-related self-efficacy	Self-efficacy	4	.849	.896	4.42 (SD = .57)	3.70 (SD = .85)

Table 4. The two-tailed Spearman correlations between the dimensions of approaches to teaching and teaching-related well-being.

	Approach to teaching							
	Interactive		Transmissive		Unreflective		Organised	
	Face-to-face	Online	Face-to-face	Online	Face-to-face	Online	Face-to-face	Online
Stress 1	−.107	−.197*	.059	.395***	.088	.307***	.068	.111
Stress 2	−.024	−.207*	−.050	.381***	.232*	.311***	.012	.166
Stress 3	−.037	−.202*	.036	.244**	.094	.405***	.062	.062
Exhaustion	.083	−.146	−.027	.198*	.024	.326***	.223*	.278**
Cynicism	−.188*	−.296**	−.088	.163	.266**	.494***	−.089	−.137
Self-efficacy	.326***	.385***	.013	−.084	−.551***	−.555***	.257**	.260**

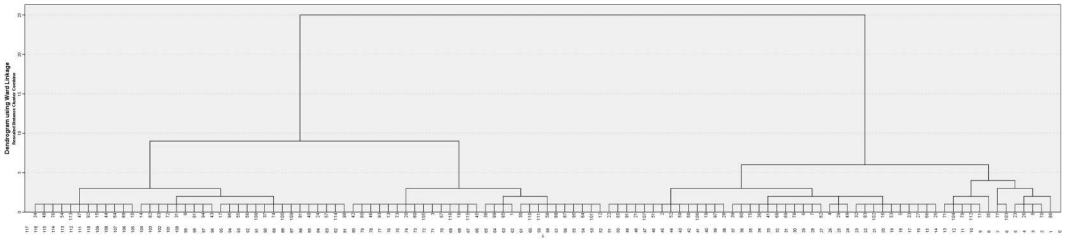

Figure 1. The dendrogram used to identify the number of clusters.

to indicate effect size, with eta-squared computed as z-score squared divided by the sample size, which can be interpreted as .01 for small, .06 for medium, and .14 for large effect sizes.

Results

The results are reported in three sections below based on the research questions. The first section reports on the general associations between approaches to teaching and teaching-related well-being. In the second section, the teachers' approaches to teaching profiles are presented. The third section continues reporting on the teacher profiles' differences in teaching-related well-being. Throughout the results section, asterisks are used in tables to denote significance levels: * for $p < .05$; ** for $p < .01$, and *** for $p < .001$.

RQ1: approaches to teaching and teaching-related well-being

The associations between approaches to teaching and teaching-related well-being are presented in Table 4. The Interactive approach to teaching is associated negatively with stress and cynicism, and positively associated with self-efficacy. The associations are stronger in the online teaching context. The Transmissive approach to teaching is associated with stress and exhaustion exclusively in the online teaching context. Unlike the interactive approach, the unreflective approach to teaching is associated positively with stress, exhaustion and cynicism, and associated negatively with self-efficacy. Again, the associations are stronger in the online teaching context. Notably, these unreflective approach associations are larger than any other corresponding association, with many exceeding the .4 threshold for medium dependence. The Organised approach to teaching is associated positively with exhaustion and self-efficacy in both face-to-face and online teaching contexts.

RQ2: teacher profiles

The teachers were clustered based on differences in their approaches to teaching dimensions between face-to-face and online teaching. The teachers were categorised under two profiles:

1. Teachers with stable approaches to teaching ($n = 65$)
2. Teachers with context-sensitive approaches to teaching ($n = 51$).

The teacher profiles' scores on the approaches to teaching factors are presented in Figure 2 and Table 5. The first profile comprises teachers whose approaches to teaching remain relatively stable in face-to-face and online teaching. The second profile comprises teachers who experience a drastic difference in their approaches to teaching between face-to-face and online teaching.

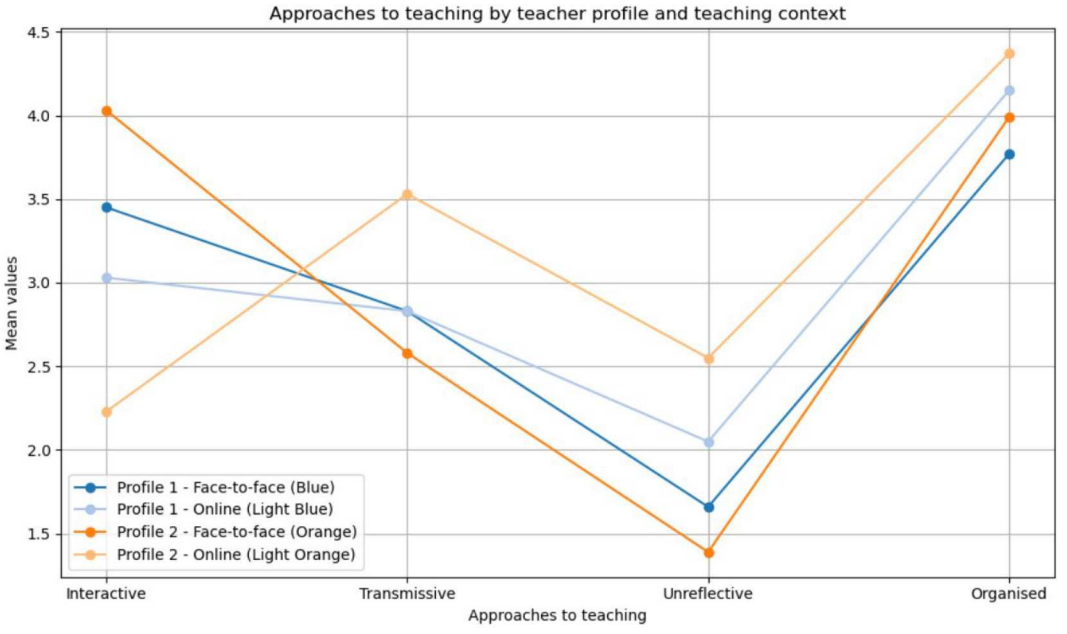

Figure 2. The two teacher profiles' mean values in the approaches to teaching factors in face-to-face and online teaching contexts.

Table 5. The teacher clusters formed based on the differences in their approaches to teaching in face-to-face and online teaching.

	Profile 1: stable AT ($n = 65$)						Profile 2: context-sensitive AT ($n = 51$)					
Approach to teaching	Face-to-face		Online		Mean difference (online – face-to-face)	η^2	Face-to-face		Online		Mean difference (online – face-to-face)	η^2
	Mean	SD	Mean	SD			Mean	SD	Mean	SD		
Interactive	3.45	.71	3.03	.92	−.43***	.16	4.03	.67	2.23	.59	−1.80***	.34
Transmissive	2.83	.70	2.83	.83	.00	.00	2.58	.77	3.53	.68	.95***	.28
Unreflective	1.66	.60	2.05	.67	.39***	.22	1.39	.43	2.55	.73	1.16***	.32
Organised	3.77	.66	4.15	.67	.37***	.16	3.99	.66	4.37	.65	.38***	.14

The mean differences and the respective effect sizes are large in the interactive, transmissive, and unreflective approaches to teaching.

When comparing the teacher profiles in the face-to-face context, the teachers with context-sensitive approaches to teaching reported statistically significantly higher values in interactive ($p < .001$, $\eta^2 = .13$) and lower values in unreflective ($p = .014$, $\eta^2 = .05$) approaches to teaching than teachers with stable approaches to teaching. In the online context, the situation is the opposite: The teachers in the context-sensitive profile reported statistically significantly lower values in interactive ($p < .001$, $\eta^2 = .21$) and higher values in transmissive ($p < .001$, $\eta^2 = .17$) and unreflective ($p < .001$, $\eta^2 = .11$) approaches to teaching than the teachers with stable approaches to teaching. Considering effect sizes as well, this indicates that the teachers having more context-sensitive approaches to teaching applied more interactive approaches in their face-to-face teaching than the teachers having more stable approaches to teaching, but while conducting online teaching during the pandemic, they applied less interactive and more transmissive and unreflective approaches to teaching. The teachers having more context-sensitive approaches to teaching also applied statistically significantly more organised approach in online teaching; however, the effect size was small ($p = .044$, $\eta^2 = .05$).

RQ3: teacher profiles and their teaching-related well-being

The teacher profiles' scores on the dimensions measuring teaching-related well-being are presented in Table 6. Considering all respondents in terms of both mean differences and effect sizes, the online context indicates particularly high teaching-related stress (Stress 2), exhaustion and cynicism, and in lower self-efficacy. This indicates that the online teaching contexts challenged all teachers' well-being regardless of their applied combination of approaches to teaching. The most substantial mean differences are in the context-sensitive teacher profile's teaching-related stress (Stress 2: MD = 1.18, $\eta^2 = .19$) and cynicism (MD = 1.17, $\eta^2 = .21$).

When comparing teacher profiles in the face-to-face context, the teachers with context-sensitive approaches to teaching reported statistically significantly higher values in general stress (Stress 1; $p = .015$, $\eta^2 = .05$), teaching-related stress (stress 2; $p = 0.25$, $\eta^2 = .04$) and exhaustion ($p = .002$, $\eta^2 = .08$). This indicates that teachers having more context-sensitive approaches to teaching experience more stress and exhaustion in face-to-face teaching than teachers having more stable approaches to teaching. However, the effect sizes are small(ish). In the online teaching context, the teachers having more context-sensitive approaches to teaching reported statistically significantly more stress (Stress 1: $p = .028$, $\eta^2 = .04$; Stress 2: $p < .001$, $\eta^2 = .18$; Stress 3: $p < .001$, $\eta^2 = .10$), exhaustion ($p < .001$, $\eta^2 = .14$) and cynicism ($p < .001$, $\eta^2 = .15$), and less self-efficacy ($p = .011$, $\eta^2 = .06$). This indicates that in online teaching, teachers having more context-sensitive approaches to teaching experience more stress, are more at risk of burnout, and experience lower levels of self-efficacy than teachers having more stable approaches to teaching. Furthermore, effect sizes varied from medium to large, thereby supporting these profile differences' significance.

Discussion

RQ1: approaches to teaching and teaching-related well-being

The present study offers novel results, identifying connections between teachers' approaches to teaching and teacher well-being. When investigating teachers' approaches to teaching and teaching-related well-being, the results indicate that the interactive approach to teaching has a positive relation and the unreflective and transmissive approaches have a negative relation to teacher well-being. The organised approach has a mixed relation to teacher well-being. Previous research has identified a connection between approaches to teaching and self-efficacy, but not between

Table 6. The descriptive statistics of the teacher profiles' scores on the dimensions of teaching-related well-being.

		Face-to-face		Online			
Well-being dimension	Profile	Mean	SD	Mean	SD	Mean difference	η^2
Stress 1	All	2.40	.92	2.68	1.18	.28**	.07
	1	2.23	.90	2.45	1.06	.22	.03
	2	2.61	.92	2.98	1.26	.37*	.05
Stress 2	All	2.12	.92	3.00	1.15	.88***	.35
	1	1.94	.79	2.58	1.04	.65***	.15
	2	2.35	1.04	3.53	1.07	1.18***	.19
Stress 3	All	2.41	1.19	2.68	1.16	.28*	.05
	1	2.31	1.19	2.35	.99	.046	.00
	2	2.53	1.19	3.10	1.24	.57*	.06
Exhaustion	All	2.21	.80	2.91	.97	.70***	.42
	1	2.01	.73	2.60	.87	.59***	.23
	2	2.47	.82	3.31	.96	.84***	.18
Cynicism	All	1.66	.79	2.40	1.01	.74***	.35
	1	1.66	.77	2.05	.90	.39***	.11
	2	1.67	.82	2.84	.98	1.17***	.21
Self-efficacy	All	4.42	.57	3.70	.85	−.72***	.51
	1	4.45	.51	3.85	.88	−.60***	.27
	2	4.39	.64	3.50	.78	−.89***	.24

approaches to teaching and the other teacher well-being variables (stress, exhaustion, and cynicism) (Cao et al., 2018). Notably, the associations between the well-being variables and the unreflective approach are larger than the other dimensions' corresponding association. Also, the correlations between teachers' approaches to teaching and teacher well-being are stronger in the online teaching context than the face-to-face context. From here, it can be concluded that a rapid shift to an online teaching environment – or any rapid change in teaching behaviour – accentuates associations between approaches to teaching and teaching-related well-being. It is not clear whether the change in teaching behaviour inflates teacher well-being or causes stress that makes teachers shift from interactive to transmissive approaches to teaching. Research has demonstrated that it also is possible to apply the interactive approach to teaching in the online context (Badia et al., 2017; González, 2012). Furthermore, no evidence was found that indicates online teaching itself is more stressful than typical face-to-face teaching. Therefore, we argue that teacher well-being is challenged not by the online environment itself, but rather the rapid shift to it, which also forces a rapid change in teaching behaviour. The accentuation was true for both teacher profiles, indicating that rapid changes challenge teacher well-being regardless of the teacher's approaches to teaching. However, from the teacher well-being perspective, the rapid shift notably was more challenging for the teachers in the context-sensitive teacher profile moving from interactive towards transmissive approaches to teaching. Perhaps the teachers in the context-sensitive teacher profile who seek more interaction with their students find the workload heavier (e.g., Salmela-Aro et al., 2019) and experience more challenges in detecting students' understanding and providing feedback (e.g., Ma et al., 2021), as their dominant approach to teaching is more challenging to transfer to the online context rapidly.

RQ2: the teacher profiles

The results demonstrate that there can be notable sensitivity to contextual variation in a teacher's approaches to teaching. Based on the results, two teacher profiles were identified: (1) teachers with stable approaches to teaching ($n = 65$) and (2) teachers with context-sensitive approaches to teaching ($n = 51$). The teachers in the first profile reported relatively stable approaches to teaching in the two contexts, but the teachers in the second profile reported statistically significantly lower interactive (MD = −1.80***) and higher transmissive (MD = .95***) and unreflective (MD = 1.16***) approaches to teaching in the online context than the face-to-face context. These results are significant as research investigating sensitivity to contextual variation in approaches to teaching remain scarce. Furthermore, a study that investigated the same higher education teachers in general and specific situations suggested that the content-focus approach is more stable than the interactive approach to teaching (Lindblom-Ylänne et al., 2006). The present study's results add to this by demonstrating that all four dimensions of approaches to teaching are subject to intrapersonal contextual variation. This indicates that instead of investigating the HEAT instrument's dimensions separately, joint investigations and understanding their different combinations' variety are needed.

The results also demonstrate the importance of investigating the characteristics of a teacher's approaches to teaching in multiple contexts to gain a more complete understanding. The teachers with context-sensitive approaches to teaching (Profile 2) apply more interactive and organised approaches to teaching in the face-to-face context than teachers with more stable approaches to teaching (Profile 1). However, this dynamic shifts in the online context, in which the teachers with context-sensitive approaches to teaching (Profile 2) are less interactive and more transmissive and unreflective than the teachers with stable approaches to teaching (Profile 1). Thus, in the online context, the teachers with context-sensitive approaches to teaching come across as transmissive and unreflective, although in the face-to-face context, they apply the opposite combination of approaches to teaching dimensions. This result highlights the contextual nature of approaches to teaching. If we only had the data from the online context, the conclusions would be different from the ones we now draw based on the intrapersonal variation between the two contexts. As

Lindblom-Ylänne et al. (2006) concluded, the investigations of approaches to teaching need to be contextual explicitly. With cross-sectional data from a single context, these variations are not visible, indicating that general-level investigations are incomplete, and that context-specific research is needed on teachers' pedagogical choices and characteristics of teaching.

RQ3: the teacher profiles and their teaching-related well-being

Based on these results from RQ1, one could deduce that the transmissive approach to teaching is related to stress and generally lowers teaching-related well-being. Although this can be the case, approaches to teaching are not linked directly to teacher well-being, i.e., a teacher can be effective even if they are not interactive. However, the results clearly indicate that the rapid change to online teaching challenges teacher well-being. As stated above, pedagogical changes generally challenge teacher well-being. However, it is worth discussing whether it was the rapid change or that the interactive teachers could no longer teach the way they wanted in the online environment. To understand this further, we asked ourselves who the teachers applying the context-sensitive approaches to teaching are. Based on the chi-squared tests, teachers of a specific grade were over-represented in the second teacher profile: 14 out of 15 teachers in that grade belonged to the second teacher profile. We reached out to the municipal educational administration and learnt that these teachers have a strong collaborative community and collegial support for professional development. Although partly anecdotal, it is possible that for the context-sensitive teacher profile, the shift to online teaching inhibited interactions, not only with their students, but also with their colleagues with whom they had formed a pedagogically supportive collegial community (e.g., Gillespie et al., 2001; Skaalvik & Skaalvik, 2010; Temiz & Topcu, 2013). This aligns with Salmela-Aro et al. (2019), who found that for teachers, work engagement and burnout are not mutually exclusive.

Limitations

The present study comes with limitations. First, due to the cross-sectional study design, causal relationships cannot be inferred from the results. Furthermore, the small sample size excluded the use of more advanced statistical analyses. Therefore, the analysis focussed on mean differences, which may overlook individual variations or more nuanced patterns in the data. Also, the data were self-reported, and the clusters were small in size – factors that need to be considered when interpreting the results. However, the sample represents the teacher population in a typical Finnish municipality; therefore, the results can be generalised at least on a national level. Still, qualitative data on the same topic could improve the interpretations made from the data.

Conclusions

The results offer two main conclusions. First, pedagogical training often aims to solicit changes in teachers' pedagogical behaviour. The results demonstrate that these types of changes challenge the teachers' teaching-related well-being. Even though the data did not allow us to make claims about changes that would be possible with longitudinal data, this poses implications for teacher education and pedagogical training. When asking teachers to develop their teaching, the teaching-related well-being aspect needs to be considered because the intended positive change in teaching behaviour comes at a (hopefully temporary) cost of teacher well-being. In line with previous research (Lindblom-Ylänne et al., 2006), the results also suggest that teachers who rely on more interaction in their teaching also take more context-sensitive approaches to teaching. It is possible that building interactive teaching-learning environments is a more contextual activity than activities that aim for knowledge transmission. This should be considered when implementing new pedagogical ideas. For example, online teaching environments, which will be even more common in the future, are possible avenues for interactive approaches to teaching (Badia et al., 2017; González, 2012).

However, if the environment is new, it takes time to rebuild contextual connections that cater to interaction.

Second, the results offer anecdotal evidence of a collegial community's important role when facing these types of rapid pedagogical changes. More research is needed to understand links between collegial community and teacher well-being further when aiming for pedagogical development. While it is possible that the community is particularly important for pedagogical development forerunners, another question for future research concerns how to create a flourishing work environment in which these teachers can protect their teaching-related well-being. The results also demonstrate a high level of intrapersonal sensitivity to contextual variation in approaches to teaching. This highlights the contextual nature of approaches to teaching, as well as the importance of contextual perspectives in future investigations on changes in teachers' pedagogical behaviour.

Data availability statement

The participants of this study did not give written consent for their data to be shared publicly, so due to the sensitive nature of the research supporting data is not available.

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