

# Factors of Digital Overload among Russian Teachers

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## Abstract

The digital transformation of education, accelerated by the COVID-19 pandemic, has increased teachers' workload, triggering digital overload, a condition characterized by cognitive exhaustion and impaired work-life balance. The aim of the study was to empirically test a comprehensive model of organizational-environmental and individual-personal factors of teachers' digital overload and its potential impact on their intention to quit. A sample of 314 teachers (96% women, average age 45) was surveyed using scales assessing the digital climate of the organization, digital competence, digital engagement, digital self-efficacy, digital overload, and intention to quit. Data were analyzed using path analysis, including the assessment of indirect effects. The results confirmed a positive relationship between teachers' digital overload and their intention to quit. The supportive digital climate of educational organizations, as an organizational-environmental factor, did not significantly affect digital overload, which contrasts with previous studies. By contrast, individual-personal factors emerged more prominently. Teachers' digital self-efficacy reduced their digital overload, while digital engagement with educational digital resources increased it. Moreover, digital competence and digital engagement reduced overload through higher digital self-efficacy. Interestingly, digital engagement directly increased digital overload but indirectly reduced it through enhanced digital self-efficacy. These findings are discussed in relation to previous research, with emphasis on their practical implications.

## Keywords

digitalization of education, digital overload, digital self-efficacy, digital competence, digital engagement, teacher turnover, organizational digital climate

**JEL codes:** J24, J28, J63

## Introduction

Contemporary society is undergoing a global digital transformation that permeates all aspects of human activity, including the professional sphere. This transformation has been particularly evident in school education, where teachers have found themselves at the forefront of digital change. These changes began before the COVID-19 pandemic but intensified and reached their peak during the period of forced self-isolation. While the transition to online learning and the introduction of digital innovations had been gradual prior to 2020, the pandemic became a catalyst for radical and irreversible shifts.

The educational process will continue to adapt to the challenges posed by artificial intelligence, Big Data, and other digital innovations, with teachers playing a key role in this transformation. However, teachers are often required to master new technologies in real time, without adequate resources, methodological support, or opportunities for gradual integration. Consequently, digital tools intended to facilitate teachers' work are frequently perceived as an additional burden, exacerbating professional stress and contributing to burnout (Saboor et al. 2024).

In this context, several critical questions arise: How can digital overload be minimized? Which factors contribute to or mitigate it? And to what extent can digital overload influence teachers' intentions to leave the profession?

The questions raised remain insufficiently explored. Nevertheless, addressing the challenges associated with digital transformation is among the key priorities in the field of education. While the inevitability of technological change is widely acknowledged, it is essential to ensure that innovations are introduced in ways that do not compromise teachers' psychological well-being or professional effectiveness.

Against this background, the present study focuses on analyzing the factors contributing to teachers' digital overload and its potential consequences, particularly the intention to leave the profession. Before moving on to the formulation of hypotheses, however, it is necessary to clarify the concept of digital overload and examine how this phenomenon is described in current scientific research.

## Teachers' digital overload

Digital overload is a problematic phenomenon that arises as a side effect of the widespread integration of technology into everyday life. A systematic review of studies on technology overload conducted between 2000 and 2020 found that digital overload was associated with work-life conflict, stress, email addiction, social media addiction, and social overload related to the duration of technology use (Rasool et al. 2022). According to Selwyn et al. (2017), active involvement of teachers in the digital environment not only transforms their professional responsibilities but also intensifies their workload, as they must constantly master new tools, manage online platforms, and interact through email, instant messengers, and social networks (Selwyn and Heffernan 2021). Digital overload is characterized by an excessive flow of information and an increasing number of digital tasks, often exceeding teachers' cognitive and time resources, which directly affects the quality of teaching (Penkowska 2018).

In this study, teachers' digital overload is defined as a condition characterized by cognitive exhaustion and disruption of work-life balance.

Although digital technologies have expanded access to unlimited educational resources, they have also created new challenges: educators face the difficulty of processing vast volumes of digital content, resulting in a constantly increasing workload. Empirical studies have consistently demonstrated that the digitalization of education is associated with higher stress levels and an increased risk of burnout among teachers (Petrash and Sidorova 2021; Khakimova et al. 2022; Morska et al. 2022; Yang and Du 2024). Consequently, teachers may experience job dissatisfaction, intentions to change careers, or even decisions to leave the profession altogether (Zair-Bek and Anchikov 2022). Evidence from Israel has further shown that emotional and physical exhaustion is a key factor driving teachers to exit the profession (Weisberg and Sagie 1999).

Thus, digital overload may naturally result in teachers' intention to quit, which leads to the formulation of the first hypothesis of this study:

H1: Teachers' digital overload is positively related to their intention to quit.

Given the irreversible nature of digitalization and its growing impact on the educational system, it is critical to identify factors that can mitigate the negative consequences of digital transformation. Accordingly, the next section reviews recent research aimed at identifying buffer mechanisms that may serve as a basis for preventing digital overload and its adverse effects.

## **Review of modern research, identification of teachers' digital overload factors, and development of research hypotheses**

Recent research on the digital transformation of education highlights a growing problem of teacher burnout linked to digital overload. A systematic review of the literature for 2012–2022 (Ensour and Al Maaitah 2024), along with a recent study on burnout in the Russian context (Kabalina et al. 2024), shows that the key determinants of this phenomenon operate at two interconnected levels: organizational and personal. This finding underscores the need for a comprehensive analysis of the factors contributing to teachers' digital overload, integrating external conditions with internal resources. Based on the analysis of recent studies, the present research proposes dividing these factors into two complementary groups, thereby providing a foundation for developing an integrative model of teachers' digital overload.

The first group comprises organizational and environmental factors, primarily reflected in teachers' perceptions of the school's digital climate. Key characteristics of this climate include the availability of technology-related professional development and the presence of an appropriate technology policy (O'Dwyer et al. 2004). Studies repeatedly note that insufficient technical support and administrative pressure to adopt new technologies act as triggers of digital burnout (García-Arroyo and Osca Segovia 2019; Morska et al. 2022). For example, Swedish teachers emphasize the need for equal access to digital tools, systematic training, and alignment of teachers' and students' digital skills (Lindell 2020).

In this study, a supportive digital climate is defined as the provision of technical and methodological assistance, access to systematic professional development in the digital environment, and administrative support. Such a climate can reduce teachers' digital burden by minimizing the time spent overcoming technical difficulties.

H2: A supportive digital climate in educational organizations is negatively associated with teachers' digital overload.

The second group comprises individual and personal factors, with digital competence playing a central role. Teachers' digital competence refers to the skills required to use technologies that continuously evolve alongside information technology developments (Spiridonova 2023). It also encompasses individuals' readiness to interact effectively with technologies, driven by motivation and responsibility, which, combined with knowledge and skills, facilitates their work (Soldatova et al. 2017). Research shows that teachers with advanced technology skills report higher job satisfaction (Nurgaliyeva et al. 2023) and greater resistance to burnout (Santos-Figueroa et al. 2023). Accordingly, digital competence enables teachers to manage digital tasks more effectively and is therefore expected to reduce the likelihood of overload.

H3: Teachers' digital competence is negatively associated with their digital overload.

Digital engagement, although generally associated with positive outcomes such as improved teaching through the use of educational technologies, also has dual effects. On the one hand, teachers immersed in information and communication technologies demonstrate high levels of competence (Hatlevik 2017). On the other hand, intensive use of multiple platforms, the continuous need to update skills, and digital multitasking can provoke technostress, emotional strain, and burnout (Califf and Brooks 2020; Castillo et al. 2020; Konovalova 2022), thereby creating strong preconditions for digital overload.

H4: Teachers' digital engagement is positively associated with their digital overload.

Digital self-efficacy, defined as confidence in one's ability to manage digital challenges, is associated with greater psychological stability. Teachers with high digital self-efficacy are less likely to focus on barriers, more successful in implementing innovations (Evers et al. 2002), and exhibit higher levels of professional development (Ma 2023). Moreover, perceived self-efficacy enhances technical skills, facilitates management of overload-related behaviors, and reduces stress (Yin et al. 2018; Tams et al. 2020). Accordingly, the following hypothesis is proposed:

H5: Teachers' digital self-efficacy is negatively associated with their digital overload.

Recent studies have highlighted a positive relationship between teachers' digital self-efficacy and factors such as a supportive digital climate, digital competence, and digital engagement. A study of Chinese teachers demonstrated a link between organizational conditions, teachers' professional characteristics, and their digital self-efficacy. Wang and Chu (2023) showed that enabling conditions – such as technological equipment, funding, methodological support, and institutional training – significantly enhance teachers' digital self-efficacy. The study also found a positive relationship between digital competence and self-efficacy. Similarly, Hatlevik (2017) reported that active use of digital tools in pedagogical practice (digital engagement) positively correlates with self-efficacy.

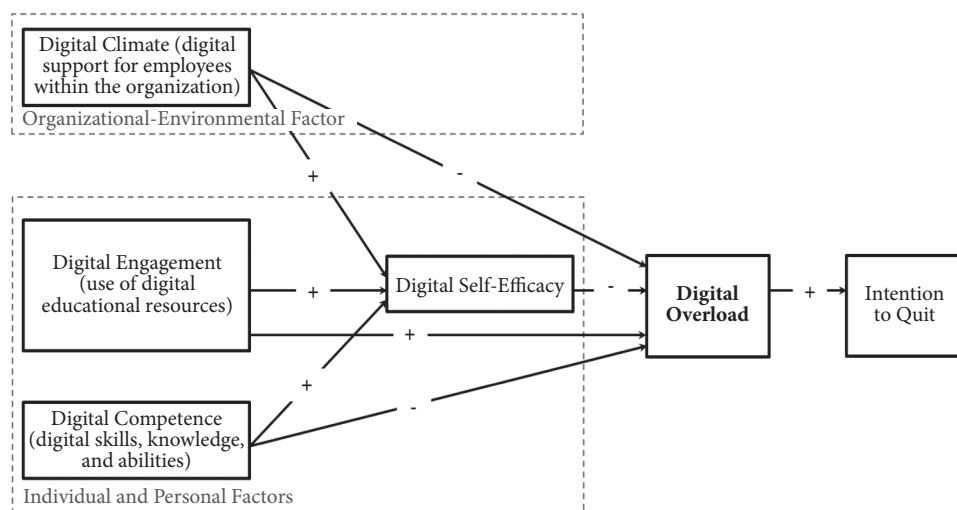
Based on these findings and the evidence supporting a negative relationship between digital self-efficacy and digital overload, this study proposes that digital self-efficacy may mediate the relationships between supportive digital climate, digital competence, digital engagement, and teachers' digital overload.

H6: Teachers who perceive the digital climate of their educational organization as supportive and demonstrate high levels of digital engagement and competence exhibit higher digital self-efficacy. In turn, higher digital self-efficacy is negatively associated with digital overload.

The literature review allows the classification of factors contributing to digital overload into two interrelated groups: (1) organizational and environmental factors, reflecting external working conditions (represented in this study by teachers' perceptions of the school's

digital climate), and (2) individual and personal factors, reflecting internal resources, including digital competence, engagement, and self-efficacy.

Although each of these factors has been studied previously, their combined effects remain poorly understood. This study is the first to empirically test a comprehensive model in which organizational conditions interact with individual characteristics, addressing the fragmentation of previous approaches. Figure 1 presents a conceptual model integrating all hypotheses and visualizing the hypothesized relationships.



**Figure 1.** Conceptual model of the study

## Sample

The study involved 314 primary and secondary school teachers. The majority were women (96%), consistent with all-Russian statistics on the gender composition of teachers (Mertsalova et al. 2022). Participants' ages ranged from 20 to 73 years ( $M = 45$ ), with teaching experience ranging from 1 to 45 years ( $M = 21$ ).

Regarding professional qualifications, 39% of teachers had no qualification category, 37% held a category corresponding to their position, 2% were of the second category, and 22% belonged to the highest category. Participants were drawn from the Central, Southern, and North Caucasian Federal Districts. The majority (90%) identified as ethnically Russian.

## Tools

### *Perceived Digital Climate*

The perceived digital climate of the educational organization was measured using a 7-item scale based on the concept of perceived organizational support (Eisenberger et al. 1986). The scale included the following items:

1. Our school has organized interaction between teachers and IT specialists.

2. I always receive timely assistance in working with digital educational resources upon request.
3. A specialist who consults on working with digital educational resources is always in touch with teachers at our school.
4. All teachers at our school are provided with methodological recommendations on the use of digital educational resources.
5. The administration of our school helps to master new digital technologies.
6. The administration pays special attention to solving problems that teachers encounter when using new digital technologies.
7. Our school conducts training for employees before introducing new digital technologies.

Responses were recorded on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). Confirmatory factor analysis (CFA) indicated satisfactory model fit: CFI = 0.99, RMSEA = 0.06, SRMR = 0.02. Internal consistency was high ( $\alpha = 0.89$ ).

#### *Digital Competence*

Digital competence was assessed using a 6-item scale, a modified version of the “Digital Competence Index” (Soldatova et al. 2013). An example item is: “I can use digital educational resources in my work without outside assistance.” Responses were recorded on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). The scale demonstrated good reliability ( $\alpha = 0.87$ ).

#### *Digital Engagement*

Digital engagement was measured through teachers’ engagement with specific educational digital resources. The scale included 13 items, with examples such as educational cases, question banks, interactive lessons, and YaKlass. Responses were recorded on a 7-point scale ranging from 1 (never used) to 7 (used constantly).

#### *Digital Self-Efficacy*

Teachers’ digital self-efficacy was measured using a 4-item scale, a modified version of the New General Self-Efficacy Scale (Chen et al. 2001). An example item is: “I believe that using digital educational resources in my lesson preparation makes my lessons more effective.” Responses were recorded on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). The scale demonstrated good reliability ( $\alpha = 0.87$ ).

#### *Digital Overload*

Teacher digital overload was assessed using a 7-item scale, a modified version of the technology overload scale (Ragu-Nathan et al. 2008). An example item is: “Digital technology forces me to do more work than I can handle.” Responses were recorded on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). Internal consistency was high ( $\alpha = 0.92$ ).

#### *Intention to Quit*

Intention to quit was measured using a single item: “I intend to quit my job in the near future.” Responses were recorded on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree).

#### *Socio-Demographic Information*

Data were collected on age, gender, teaching tenure, qualification category, and nationality.

#### *Data Analysis*

Statistical analyses were conducted using SPSS 26.0 and AMOS 26.0. Assumptions of linearity, homoscedasticity, normality of residuals, and absence of multicollinearity ( $VIF < 3$ ) were verified. Hypotheses were tested using path analysis with assessment of indirect effects.

Results

Descriptive statistics for the main study variables are presented in Table 1.

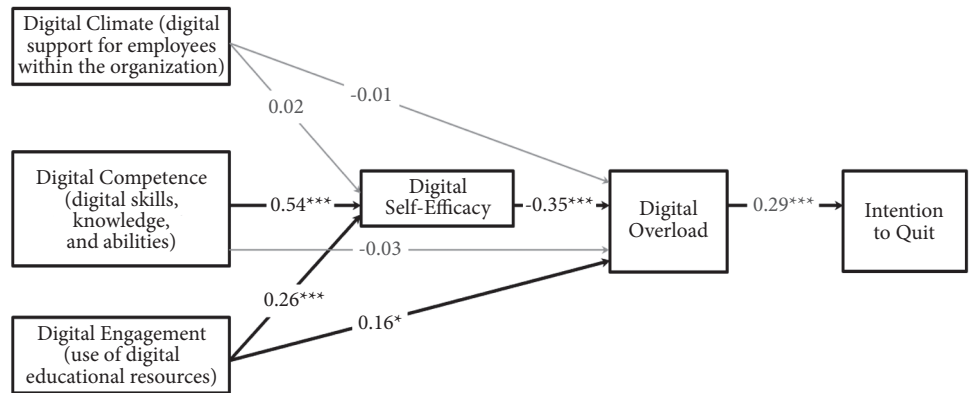
**Table 1.** Descriptive statistics of the main study variables

	Minimum	Maximum	Average	Standard deviation
Digital climate	1.29	7.00	5.28	1.30
Digital Competence	1.00	7.00	5.73	1.08
Digital engagement	1.23	7.00	4.98	1.20
Digital self-efficacy	1.00	7.00	5.60	1.27
Digital overload	1.00	7.00	4.09	1.68
Intention to Quit	1.00	7.00	2.35	1.88

The data presented in Table 1 indicate that teachers perceive the digital climate in their educational institutions as supportive and report relatively high levels of digital competence and digital self-efficacy. Engagement with digital educational resources is slightly lower, but still above the midpoint of the scale, indicating a generally high level of involvement. Digital overload is also notable, with an average score above the scale midpoint. In contrast, teachers’ intention to quit appears low, with a mean value below the midpoint.

A regression analysis examining the potential effects of socio-demographic characteristics on digital overload revealed that only gender was a significant positive predictor ( $\beta = 0.12$ ,  $p = 0.04$ ), indicating that female teachers experience higher levels of digital overload than their male counterparts. Consequently, gender was included as a control variable in the path analysis model.

Figure 2 presents the empirical test of the conceptual model introduced in Figure 1.



**Figure 2.** Empirical research model (results of path analysis with assessment of indirect effects). *Note:* \*\*\*  $p < .001$ ; \*  $p < .05$ ; the model fit indices are satisfactory:  $\chi^2/df = 2.234$ , CFI = 0.992, RMSEA = 0.063, PCLOSE = 0.289, SRMR = 0.303

The results illustrated in Figure 2 indicate that a supportive digital climate in educational organizations is not significantly associated with teachers' digital self-efficacy or their digital overload. Teachers' digital competence was significantly positively related to their digital self-efficacy, but showed no significant direct association with digital overload. Digital engagement with educational resources was significantly positively associated with both digital self-efficacy and digital overload. Additionally, digital self-efficacy was significantly negatively related to teachers' digital overload. Finally, digital overload was significantly positively associated with teachers' intention to quit.

The results of the direct and indirect effects are presented in Table 2.

**Table 2.** Direct and indirect effects

Mediator "Digital self-efficacy"		Dependent variable "Digital overload"	
Predictors		Direct effect	Indirect effect
↓			
Digital climate		-0.01	-0.01
Digital Competence		-0.03	-0.19***
Digital engagement		0.16*	-0.10***
Mediator "Digital overload"		Dependent variable "Intention to quit"	
Predictors		Direct effect	Indirect effect
↓			
Digital self-efficacy		0.00	-0.10***

Note: \*\*\*  $p < .001$ ; \*  $p < .05$

The data presented in Table 2 reveal significant negative indirect effects of digital competence and digital engagement on digital overload, mediated by digital self-efficacy.

Additionally, a significant negative indirect effect of digital self-efficacy on teachers' intention to quit was observed, operating through its impact on digital overload.

## Discussion of the research results

The aim of this study was to examine the complex factors contributing to digital overload among Russian teachers and its potential impact on their intention to leave the profession. The discussion is structured in accordance with the hypotheses proposed.

### *Digital Overload and Intention to Quit*

The first hypothesis, proposing a positive relationship between digital overload and teachers' intention to quit, was empirically supported. The findings indicate that teachers who perceive working with digital educational resources as an excessive workload, disrupting the balance between professional and personal life, are more likely to express intentions to leave the school. This result aligns with previous studies, including research on Russian teachers during the pandemic, which found that work overload was associated with a desire to change professions (Koneeva et al. 2021). Thus, digital overload not only reflects professional discomfort but also serves as a significant predictor of staff turnover, highlighting the need for systemic interventions to mitigate it.



### *Digital Climate of Educational Organization and Digital Overload*

The second hypothesis, which posited a negative relationship between a supportive digital climate in educational organizations and teachers' digital overload, was not confirmed. This finding contradicts prior research, mainly from international studies, in which organizational support – both technical and administrative – was identified as a significant predictor of digital burnout (García-Arroyo and Osca Segovia 2019; Morska et al. 2022). The results suggest that even when resources and infrastructure are available, external conditions may not directly reduce the digital burden experienced by Russian teachers.

This discrepancy indicates that the key determinants of digital overload may reside at the individual-personal level. To explore this possibility, the following section discusses the results related to individual and personal factors.

### *Digital Competence and Digital Overload*

The third hypothesis, which proposed a negative relationship between teachers' digital competence and their digital overload, was not empirically supported. This finding contrasts with previous studies in which teachers' technological literacy was associated with greater resilience to professional burnout (Santos-Figueroa et al. 2023). The absence of a significant relationship suggests that digital competence alone – i.e., possession of digital skills and knowledge – may not be sufficient to reduce workload. Rather, the critical factor may be teachers' ability to manage digital tasks effectively in the context of multitasking, limited resources, and constantly changing demands.

### *Digital Engagement and Digital Overload*

The fourth hypothesis, which proposed a positive relationship between teachers' digital engagement and their digital overload, was supported. The results indicate that the more actively teachers engage with a variety of digital educational resources, the more likely they are to experience a workload that exceeds their personal resources. This finding aligns with prior research (Califf and Brooks 2020; Castillo et al. 2020), which identified intensive work with multiple platforms, the continuous need to master new tools, and digital multitasking as key triggers of technostress – a condition characterized by cognitive overload and emotional burnout.

These findings underscore the paradox of digital engagement: while it has the potential to enhance the quality of teaching and learning, excessive or uncontrolled digital activity can transform digital innovations into a source of chronic teacher fatigue. This highlights the need for strategies that promote the measured introduction of digital educational resources, balancing pedagogical effectiveness with the psychological cost of their use.

### *Digital Self-Efficacy and Digital Overload*

The fifth hypothesis, which proposed a negative relationship between teachers' digital self-efficacy and their digital overload, was supported. The results indicate that the higher teachers' confidence in their ability to effectively use digital tools in the educational process, the lower their level of digital overload. This finding aligns with prior research, where digital self-efficacy has been identified as a key predictor of adaptability in the face of technological challenges. For instance, teachers with high self-efficacy are less likely to focus on barriers (Evers et al. 2002) and demonstrate greater flexibility in adopting innovations, which is closely linked to professional development (Ma 2023).

A possible mechanism underlying this effect is cognitive reframing (Robson and Troutman-Jordan 2014); teachers with high self-efficacy are likely to perceive technology not as a threat, but as a resource that enhances their professional capabilities.

### *Indirect Effect of Organizational Conditions and Individual-Personal Factors on Digital Overload through Digital Self-Efficacy*

The sixth hypothesis, which proposed that a supportive digital climate, digital competence, and teacher engagement indirectly reduce digital overload through increased self-efficacy, was partially supported. The results indicate some ambiguity regarding the mediating role of self-efficacy. While both digital competence and engagement showed significant indirect effects through self-efficacy, the supportive digital climate did not demonstrate a significant mediated effect. These findings suggest that individual-personal factors may play a more prominent role than organizational conditions in mitigating digital overload.

The supportive digital climate of educational organizations did not exhibit a significant indirect effect on digital overload via digital self-efficacy, contrary to expectations based on prior research (Wang and Chu 2023).

In contrast, digital competence and digital engagement were significant predictors of reduced digital overload through enhanced self-efficacy. Teachers with higher technological skills (competence) and greater activity in using digital resources (engagement) demonstrated stronger self-efficacy, which, in turn, mitigated their subjective perception of workload.

These findings suggest that the limited impact of organizational digital climate highlights the need for more targeted support. Beyond providing resources, it is crucial to create conditions that allow teachers to use technology in a psychologically safe manner. The confirmation of self-efficacy's mediating role in the context of competence and engagement underscores the primacy of personal resources over external conditions in preventing digital overload.

Additionally, a negative indirect effect of digital self-efficacy on intention to quit via digital overload was observed. That is, higher levels of digital self-efficacy reduce digital overload, which in turn decreases the likelihood of teachers leaving the profession.

## **Conclusion**

This study tested a comprehensive model of organizational-environmental and individual-personal factors contributing to teachers' digital overload and its potential impact on their intention to quit. The findings indicate that, in the context of rapid digitalization of education, the sustainability of teachers' professional activity relies less on external support and more on internal resources, with digital self-efficacy playing a central role. Teachers' ability to transform technological challenges into opportunities through self-confidence serves as a powerful mechanism for reducing digital overload, mediating the effects of factors such as digital competence and engagement. Paradoxically, the active use of digital tools intended to optimize teaching can increase perceived workload if teachers are unable to use these resources effectively within their educational practice.

The practical significance of this study lies in shifting the focus of digital transformation strategies in schools: rather than merely expanding technological infrastructure, human-centered approaches should be prioritized.

One promising direction is the development of training programs aimed at enhancing teachers' digital self-efficacy. Additionally, policymakers should consider establishing standards that limit the unregulated introduction of technologies and ensure that teachers' right to a balance between work and personal life is protected, as this balance is often disrupted by the implementation of digital tools (Abramov et al. 2020).

The findings of the present study offer several avenues for further research. For instance, future studies could examine the mechanisms through which self-efficacy reduces digital overload, such as cognitive reframing or perceived social support from colleagues. Cross-cultural comparisons would also be valuable in assessing the generalizability of these findings, while longitudinal research could provide insights into causal relationships and the dynamics of digital overload over time.

This study has several limitations. First, it relied on teachers' self-reports, which may have affected the objectivity of assessments of digital overload and self-efficacy. Second, the sample was limited to the Russian context, restricting the generalizability of the results to other educational systems. Third, the cross-sectional design does not allow for tracking changes over time. Nevertheless, despite these limitations, the study makes a significant contribution to understanding digital transformation as a human-centered process, in which technology should serve the teacher rather than the other way around. Future research in this area can help transform digitalization from a source of stress into a catalyst for teachers' professional growth.

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