Understanding Teacher Workload in Blended Learning: Insights Through the Job Demands-Resources Model

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Abstract: Blended learning (BL) has become an increasingly prevalent instructional model in primary and secondary education, yet its implementation has intensified concerns about teacher workload and well-being. While prior research has documented workload pressures associated with digitalization and AI integration, there remains limited empirical insight into how teachers experience, interpret, and manage these demands in blended learning environments. Guided by the Job Demands-Resources (JD-R) model, this qualitative study investigates how BL reshapes teachers' job demands and resources, and how educators respond to these changes in practice. Specifically, this study explores how BL influences teachers' perceived workload (RQ1), the specific challenges they encounter during BL implementation (RQ2), and the strategies and resources they employ to manage these demands effectively (RQ3). Semi-structured interviews were conducted with ten primary and secondary schoolteachers in Flanders (Belgium) who had experience implementing blended learning. Data were analysed using a reflexive thematic analysis supported by NVivo, following a systematic and iterative coding process. The JD-R model informed the analytical lens, enabling the identification of workload-related demands, available resources, challenges and coping strategies within teachers' everyday practice. Regarding RQ1, the findings demonstrate the dual nature of blended learning as both intensifying workload and providing supportive resources. Teachers reported increased demands from dual-mode lesson design, technological integration, expanded assessment requirements, and institutional platform mandates, leading to cognitive and emotional strain. Conversely, automated assessment, reusable digital materials, learning platforms, and inclusive tools reduced administrative effort and supported organization, partially decreasing these heightened demands. With regard to RQ2, workload pressures were intensified by challenges in digital classroom management, frequent technical disruptions, and the continuous need to learn and support new technologies. Teachers also reported emotional and organizational strain linked to ineffective collaboration, time constraints, infrastructural shortcomings, and resistance to pedagogical change, particularly during early stages of blended learning (BL) adoption. In response to RQ3, teachers described a range of coping strategies and supportive resources. These included reusing and adapting digital materials, employing AI-supported tools for automated assessment, developing digital skills through peer support, and implementing structured classroom routines. Institutional resources, such as reliable IT support, modular professional development, collaborative planning, clear BL guidelines, and leadership support, functioned as key job resources that buffered workload pressures and supported sustainable BL practices. This study contributes to the literature by applying the JD-R model to the K-12 blended learning context, offering a theoretically grounded account of how workload pressures and supports interact in teachers' daily work. Beyond documenting challenges, the findings generate actionable insights for school leaders and policymakers, highlighting the need for systemic workload-sensitive BL implementation, structured collaborative planning, and sustained professional development aligned with instructional realities. By reframing blended learning through a job demands-resources perspective, this study advances understanding of sustainable technology integration in compulsory education.

Keywords: Blended learning, JD-R, Workload, Challenge, Strategy, Teachers, Primary and secondary school, Belgium

1. Introduction

With technological change transforming the nature of work and societal participation, educational institutions must evolve accordingly, adopting pedagogical models that equip learners with the competencies needed to succeed in a rapidly shifting and digitally mediated environment. To achieve this, schools are increasingly moving away from exclusively face-to-face instruction toward more flexible, personalized, and engaging approaches such as online, blended, or hybrid learning models (LeBlanc, 2020). Blended learning (BL), in particular, has gained prominence as a pedagogical model that combines traditional classroom instruction with digital tools, offering adaptability to diverse learner needs (Bonk & Graham, 2012). BL is recognized for promoting individualized learning opportunities, real-time interaction, and sustained student engagement (Rasheed, Kamsin, & Abdullah, 2020). However, the integration of digital technologies into everyday teaching practice also creates new demands for teachers, requiring them to redesign lessons, incorporate new tools, and continuously

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monitor student progress. These additional tasks substantially increase workload not only in terms of time but also in terms of cognitive and emotional demands (Crews et al., 2008; MacIntyre, Gregersen, & Mercer, 2020). Such pressures are consistent with the Job Demands-Resources Model (Bakker & Demerouti, 2017), which posits that heightened job demands without sufficient resources can lead to strain and decreased work engagement, making workload an essential theoretical lens for understanding BL implementation.

Specifically, in primary and secondary education, emerging research underscores the intensified workload challenges teachers face in BL contexts. For example, Mendoza (2023) found that in special education settings, teachers experienced heavier workloads due to unstable internet, lack of training, and insufficient parental support, and coped by modifying lessons and relying on peer collaboration. Similarly, Wang et al., (2025) explored the effects of teachers' perceived workload on their work engagement in Chinese primary and secondary schools using a person-centered approach. In the European context, evidence from Belgium highlights that workload is not only increasing in absolute hours but also intensifying, with teachers performing more administrative and instructional tasks per unit of time under BL (Creagh et al., 2023). This is particularly relevant given that Belgian schools are under strong policy pressure to integrate digital technologies following the COVID-19 pandemic, supported by national initiatives such as the Digisprong programme (Flemish Ministry of Education, 2021). Yet, these reforms have not been accompanied by sufficient understanding of how BL affects teachers' daily working conditions.

While the literature has examined workload in higher education (Garone et al., 2022; Hill & Smith, 2023) and indicates that previous reviews often lack a deep exploration of how teaching methodologies influence workload perception (Radovan & Radovan, 2024), relatively little is known about how primary and secondary school teachers in Belgium perceive workload changes specifically attributable to BL, how they experience the challenges associated with these changes, and which coping strategies they employ. Addressing this gap is not only empirically necessary but also theoretically important. A better understanding of teacher workload in BL contributes to refining JD-R-based interpretations of technology-enhanced teaching, while also offering practical insights for Belgian schools navigating post-pandemic digitalisation mandates. Without such insights, schools risk implementing BL in ways that unintentionally intensify teacher workload and undermine both teacher wellbeing and instructional quality.

To bridge the research gap mentioned above, the research questions addressed in this research are as follows:

RQ1: How do primary and secondary school teachers in Belgium perceive workload changes (increases and/or decreases) associated with blended learning (BL), particularly in terms of job demands?

RQ2: What specific job demands and resource-related challenges do Belgian primary and secondary school teachers encounter when implementing BL?

RQ3: What job resources and coping strategies do Belgian primary and secondary school teachers identify as most effective in managing their workload in a blended learning context?

2. Theoretical Background

Belgian primary and secondary schools have undergone accelerated digitalisation in recent years, particularly following the COVID-19 pandemic and the launch of digitalisation initiatives such as the Flemish Digisprong programme (Flemish Ministry of Education, 2021). These reforms require teachers to adopt blended learning (BL) on a large scale, often without proportional increases in time, training, or instructional support. Because BL simultaneously introduces new pedagogical, technological, and organisational demands, a theoretical lens that captures the interaction between workload pressure, available support systems, and teacher well-being is needed. The Job Demands-Resources (JD-R) Model provides such an integrated perspective. Unlike technology-specific models such as TPACK (Mishra & Koehler, 2006), TAM (Davis, 1989), or UTAUT (Venkatesh et al., 2003), which focus primarily on technology acceptance or teacher knowledge, the JD-R framework allows researchers to examine how digitalisation affects teachers' working conditions, strain, engagement, and coping strategies, which are core concerns in Belgian BL implementation. This makes JD-R particularly appropriate for analysing BL-related workload in the Belgian context.

2.1 Job Demands-Resources (JD-R) Model

According to Demerouti et al. (2001), Job Demands-Resources (JD-R) Model explains how job demands and available resources influence perceived workload and teacher well-being. Illuminated by this model, this research explores how job demands, available digital tools and support, when teachers adapt to blended learning, influence perceived their workload and teacher well-being. In the context of Belgian BL

implementation, where teachers must redesign lessons, integrate digital tools, manage parallel modalities, and support diverse learners, the JD-R model provides a mechanism for understanding how these combined pressures contribute to perceived workload intensification (Bakker & Demerouti, 2007; Rasheed, Kamsin, & Abdullah, 2020).

While previous research identifies multiple BL-related demands, these studies often appear fragmented or descriptive. Synthesising these findings reveals three recurring demand patterns: (1) Pedagogical complexity, including the need to design content for both online and face-to-face modalities (MacIntyre, Gregersen, & Mercer, 2020); (2) Technological demands, such as acquiring digital literacy and solving technical issues (Rasheed, Kamsin, & Abdullah, 2020; Bower et al., 2015; Batista-Toledo & Gavilan, 2025); and (3) Emotional and interactional demands (Batista-Toledo & Gavilan, 2025; Liao et al., 2025), particularly associated with continuous monitoring, online communication, and supporting diverse learners (Schipor & Duca, 2021). The JD-R model integrates these multidimensional pressures into a unified structure, allowing analysis not only of the quantity of tasks but also of the quality and intensity of the cognitive, behavioural, and emotional efforts required.

In addition, the JD-R model emphasizes that job resources, such as infrastructure, training, collegial collaboration, administrative support (Liao et al., 2025), and leadership practices (Cheng & Zhu, 2021; 2023; 2024), can buffer the negative effects of high demands and foster motivation (Bakker & Demerouti, 2017). In the Belgian context, where digital infrastructure and teacher support systems vary widely across schools (European Schoolnet & University of Liège, 2012), understanding the availability and perceived usefulness of resources is crucial. This study therefore applies the JD-R model to examine how teachers experience the balance between BL-related demands and available resources, and how this balance influences their overall workload and well-being.

2.2 Variations in Decreased Workload and Increased Workload

The JD-R framework further explains why teachers in similar BL environments may perceive workload differently. Some digital tools can reduce workload by automating tasks, streamlining communication, or easing assessment processes (Kumar et al., 2021; Alkhayat et al., 2022). Through synthesizing across studies, we can find these workload-reducing resources typically involve:

- Automation and digital organisation systems (Kumar et al., 2021)
- Data-driven monitoring tools enabling more efficient feedback (Alkhayat et al., 2022)
- Collaborative or self-directed learning structures that reduce direct supervision (Bishop & Verleger, 2013; Sari & Hermawan, 2022)

However, these potential efficiency gains contrast with empirical evidence showing that BL often increases workload, particularly when demands outweigh resources (Feng, Wang, & Wu, 2018). Studies report that teachers face increased planning time, technological uncertainty (Batista-Toledo & Gavilan, 2025), and demands for constant communication (Shahkarami et al., 2025) and monitoring (Crews et al., 2008; MacIntyre, Gregersen, & Mercer, 2020; Liao et al., 2025) in BL. When digitalisation policies advance faster than school-level support structures, as occurs in many Belgian schools, the imbalance between demands and resources intensifies stress and reduces work engagement (European Schoolnet & University of Liège, 2012). This synthesis highlights a theoretical gap in existing BL workload research: many studies document challenges (Shahkarami et al., 2025; Batista-Toledo & Gavilan, 2025) or benefits (Alkhayat et al., 2022; Kumar et al., 2021; Shahkarami et al., 2025) separately but rarely examine how teachers manage the simultaneous coexistence of work-increasing and work-reducing factors. The JD-R model is particularly suited to addressing this gap because it conceptualises workload not as a linear outcome but as a dynamic equilibrium between multiple demands and resources. By applying the JD-R model, this study identifies specific BL-related demands (e.g., technological literacy, parallel lesson planning, classroom diversity, technical troubleshooting; Feng, Wang, & Wu, 2018) and insufficient resources (e.g., uneven infrastructure, limited PD, inconsistent leadership support; Crews et al., 2008; MacIntyre, Gregersen, & Mercer, 2020), and explores how these shape teachers' perceptions of workload and well-being (Demerouti et al., 2001; Bakker & Demerouti, 2007). Thus, the JD-R model provides a theoretically rigorous basis for understanding teacher workload in BL environments. It enables an analysis not only of the pressures teachers face but also of the conditions under which BL may become either a source of strain (Radovan & Radovan, 2024) or a source of motivation.

3. Methodology

3.1 Design

This study employs a qualitative research approach, with Moustakas' (1994) phenomenological method, participants discuss and share their experiences regarding their experiences concerning workload and the challenges they are facing in BL environments. Qualitative data is gathered through semi-structured interviews. The interview questions focus on teachers' personal experiences, challenges, and strategies related to workload management in BL contexts.

3.2 Participants

This research was conducted within the context of primary and secondary schools in Belgium, particularly those that have integrated BL, which is an educational method that merges conventional on-site instructions with digital learning experiences and integrates various forms of technology (Davis & Fill, 2007; Mintii, 2023). Ten teachers from primary or secondary schools in Belgium with experiences in BL environments were interviewed (**Table 1**). To maintain the diversity of the samples, different gender, age, or teaching experiences were considered during sampling.

Table 1: Demographic information of the participants

Participants	Gender	Experience	Age	Subject	Level
P1	Female	1 year	24	General education*	Primary school
P2	Female	17 years	49	Art history & Architecture	Secondary school
P3	Male	8 years	31	Biology, chemistry and Physics	Secondary school
P4	Female	21 years	49	Catholicism, religion.	Secondary school
P5	Female	5 years	31	Visual arts & physical Education	Primary & secondary school
P6	Male	7 years	30	Sexuality education, Spanish	Primary & secondary school
P7	Female	8 months	22	English, Dutch, history	Secondary school
P8	Female	20 years	44	Science, English	Secondary school
P9	Female	3 years	23	English, Dutch	Secondary school
P10	Male	13years	44	Math, science	Secondary school

*General education in the PYP system (mathematics, English, history and science)

3.3 Data Collection

An instrument guide has been developed to guide the design of the semi-structured interview protocol. The guide/grid mapped each interview question to the study's research questions and key theoretical constructs derived from the Job Demands-Resources (JD-R) model, comprising questions designed to elicit information about the practices, specific challenges, the types of support and resources that teachers require to manage their workload, and the strategies teachers find most effective in dealing with the workload in BL environments. This ensured conceptual alignment between data collection and the analytical framework. The semi-structured interviews were arranged either face-to-face or online. The duration of the interviews were approximately 30 to 40 minutes and were recorded and subsequently transcribed into text.

3.4 Ethical Consideration

All the participants were informed of the confidentiality and anonymity of data collection and the purpose of the study. Before the interviews, researchers notified interviewees of the confidentiality of the research for the second time and asked permission to record the interviews. Researchers obtained participants' data collection agreements by a written and signed informed consent form.

3.5 Data Analysis

The data were analyzed using reflexive thematic analysis guided by Braun and Clarke's (2006) six-phase framework, implemented in Nvivo, a qualitative data analysis software that assists researchers in organizing, analyzing, and deriving insights from non-numerical or unstructured data. Thematic analysis allows researchers

to identify, analyze, and interpret patterns of meaning within qualitative data, thereby deepening understanding of the studied phenomenon. While the analytic procedure followed Braun and Clarke's thematic framework, the interpretive orientation was informed by phenomenological principles (Moustakas, 1994; Creswell, 2009), this approach facilitated an in-depth exploration of participants' experiences regarding their workload in blended learning (BL) settings. This combination was deliberate, thematic analysis provided a systematic coding and theme development structure, and phenomenology guided the interpretive lens.

The analysis process was conducted iteratively and collaboratively. Initially, researchers read and familiarize (phase 1) themselves with the data and independently coded (phase 2) an initial sample of transcripts line-by-line, capturing both semantic content (explicit meanings) and latent patterns (underlying assumptions or tensions), memoing was used to support reflexive thinking during coding. Coding was continuously reviewed, refined, and organized using NVivo's node hierarchy and visual mapping tools. Consensus was reached through iterative negotiation and reflexive discussion, disagreements were resolved through dialogue and reflexive engagement with the data until a shared interpretive understanding was reached. Preliminary codes were then grouped into potential themes (phase 3), which were then reviewed and refined through regular re-examination of the coded extracts (phase 4) and the dataset as a whole by three researchers collaboratively. Themes were defined and named (phase 5) with clear descriptions of their scope and analytic contribution, and ultimately integrated into a narrative account (phase 6) aligned with the Job Demands-Resources (JD-R) model. In order to ensure the research trustworthiness, validity and reliability, peer debriefing and co-author cross-checking were conducted to help identify blind spots and strengthen confirmability (Lincoln & Guba, 1985; Birt et al., 2016). Throughout the process, the researchers collaboratively compared and discussed codes' discrepancies, and refined the codebook to maintain analytic trustworthiness and ensure that the findings faithfully represented participants' experiences.

4. Results

BL brings a complex dynamic to the teaching environment, which impacts teacher workload in diverse ways. This section presents the exploration of teachers' perception of the workload in BL environments, underscoring their experience with both the increase and decrease in workload, and teachers' perceived strategies for managing workload in BL.

4.1 Perceived workload changes in BL (RQ1)

4.1.1 Increased workload (job demands)

The findings in **Table 2** reveals that teachers perceive a significant increase in workload associated with blended learning (BL), primarily due to elevated job demands. Instructional complexity emerged as a central burden, with participants reporting the need for dual-mode planning, creating both digital and in-person materials, often without access to standard course books, requiring substantial time investment (P7). Technological challenges further compounded the workload, as teachers faced the dual task of mastering new platforms and teaching digital literacy to students, which added an additional layer of complexity to lesson integration (P3). Assessment practices also shifted under BL, replacing spontaneous oral feedback with time-intensive written documentation, thus increasing administrative effort (P5). Lastly, psychological pressures contributed to workload intensification, as institutional mandates around digital platform usage created rigid expectations and stress (P3). These findings align with the job demands aspect of the Job Demands-Resources model, indicating that the implementation of BL often amplifies cognitive, emotional, and logistical burdens on teachers.

Table 2: Perceived workload increase associated with BL in terms of job demands

JD-R Category	Code	Quote
Job Demands	Instructional Complexity	"You don't have any course books and you need to make all your material yourself." (P7)
	Technological Challenges	"When you're having to embed that into your curriculum... it definitely increased workload." (P3)
	Assessment and Feedback	"Written feedback replaced oral... spend more time writing everything down." (P5)
	Psychological Pressure	"You must use this platform this many times... it was demanding." (P3)

4.1.2 Decreased workload (job resources)

Table 3 highlights several key job resources that help alleviate the workload associated with blended learning (BL) as perceived by Belgian primary and secondary school teachers. Automation in assessment plays a significant role, as tools with auto-grading features and centralized digital platforms streamline feedback and reduce the administrative burden of collecting and organizing student work (P10). The availability of reusable digital materials from platforms like Twinkl, Kahoot, and BookWidgets further supports workload management by minimizing lesson preparation time and allowing teachers to focus more on instructional delivery. Additionally, digital platforms enhance efficiency through systematic tracking of student progress, enabling better organization and reducing redundant work (P5). Inclusive and collaborative tools such as text-to-speech software, translation services, and platforms like Digipad also contribute to teaching efficiency by accommodating diverse learning needs and facilitating group interaction (P1). Together, these resources reflect the supportive side of the Job Demands-Resources model, demonstrating how digital innovations can buffer against the intensified demands of BL environments.

Table 3: Perceived workloads decrease associated with BL in terms of job resources

JD-R Category	Code	Quote
Job Resources	Automation in Assessment	"Everything is in one location… I don't have to collect things." (P10)
	Material Reusability / Access	"Flexible and reusable materials… saving time."
	Digital Monitoring / Student Data	"Everything is more well-organized… you can see if they have made progress." (P5)
	Inclusive Tools / Collaboration	"Translation software… text-to-speech… Digipad for group work." (P1)

4.2 Workload Challenges when implementing BL (RQ2)

The implementation of blended learning (BL) introduces a range of workload-related job demands for teachers, as detailed in **Table 4**. Teachers report that digital content creation is especially time-intensive, particularly when developing interactive materials like those required by platforms such as BookWidgets (P2). Additionally, the need to align teaching content with rigid platform structures adds an extra layer of complexity and time commitment (P3). Classroom management also becomes more challenging in digital contexts, with multitasking students displaying disruptive behavior when disengaged (P4). Technical disruptions, such as unreliable internet connections and broken links, further undermine instructional flow, often derailing entire lessons (P4). Communication with colleagues is another point of strain, marked by feelings of isolation and ineffective collaboration (P2, P5). Teachers also face the ongoing burden of learning to use new technologies, maintaining existing tools, and assisting students with tech issues (P3, P8). Infrastructural deficits, including the absence of basic devices like projectors or screens, limit effective lesson delivery (P9), and insufficient, surface-level training leaves educators underprepared and overwhelmed (P5, P7). Time management remains a pervasive issue, with many teachers struggling to prioritize tasks in the face of constant workload pressures. Lastly, shifting to a digital pedagogy often meets internal resistance, especially among those accustomed to traditional teaching methods (P10).

Table 4: Job demands and resource-related challenges when implementing BL

JD-R Category	Code	Quote
Job Demands	Digital Content Creation	"It is a lot of work to make all the things because I use Book Widgets…" (P2)
	Platform Format Misalignment	"Aligning myself with the platform… that was what took the time." (P3)
	Student Management	"When students are not busy… they get annoyed… you get emotional again." (P4)
	Technical Breakdowns	"Just one site that doesn't work… can ruin the entire session." (P4)
	Communication and Collaboration	"We are both on a different island." (P2); "Feels like running all the time." (P5)
	Tech Integration & Maintenance	"Must constantly adapt and upskill…" (P8); "Basic tech assistance for students" (P3)

JD-R Category	Code	Quote
	Infrastructure Gaps	"The only support that I need is a projector or a TV screen…" (P9)
	Inadequate Training	"Short sessions lack depth…" (P5); "Modular training is better." (P7)
	Time Management Pressure	"Never-ending to-do lists… need specific training to prioritize tasks."
	Pedagogical Shift Challenges	"I was hesitant at first to switch over to the computer." (P10)
Job Resources	On-Site Tech Support (Needed)	"Having like people who know a lot… so teachers can ask for help." (P7)
	Modular Training Approach (Needed)	"Modular training… progress by mastering particular skills." (P7)

Amid these challenges, teachers also identified crucial job resources that could help mitigate the demands of BL (see Table 4). Foremost among these is the need for on-site technical support, readily available experts who can provide immediate, personalized assistance with digital tools and troubleshooting (P7). Teachers also called for a modular training approach that enables progressive skill-building, with each module focusing on specific competencies in digital instruction. This training model, as suggested by participants, would allow for more sustained and meaningful professional development compared to short, superficial sessions (P7). These findings underscore the importance of structural and institutional support in sustaining teacher well-being and instructional quality in blended learning contexts.

4.3 Strategies for Managing Workload in BL (RQ3)

A variety of strategies have been shown to be helpful in addressing the various challenges that Belgian primary and secondary school teachers have when teaching students in a BL setting. This section focuses on the strategies put up by the participants for coping with challenges in **4.2**, strategies framed in eight aspects in terms of Job Demands and strategies framed in four aspects in terms of Job Resources are highlighted.

The results reveal a range of teacher-initiated strategies developed to cope with the job demands of implementing blended learning (BL) (see **Table 5**). To address the heavy workload of content creation, teachers increasingly rely on pre-made digital resources from platforms like Canva and Kahoot, as well as AI tools such as ChatGPT for automating quizzes and summaries (P6). For those struggling with digital literacy, continuous upskilling through modular, skill-based training and peer support proved essential (P2, P7). Challenges related to student management in tech-rich environments are mitigated through structured laptop use and proactive classroom control techniques (P7, P10). Technical issues and infrastructure limitations are countered with backup plans, enhanced IT support, and advocacy for smart school platforms (P1, P4). To combat emotional stress, teachers adopt mindfulness practices and benefit from institutional policies promoting well-being, such as "no emails on weekends" (P4, P6). Teachers also streamline assessment tasks by leveraging auto-grading and formative feedback tools like BookWidgets and Kahoot (P3, P6), while digital planning tools such as Seesaw, Google Calendar, and organized file systems aid in managing time more effectively.

Table 5: Identified coping strategies regarding Job Demands in managing teachers' workload in BL

JD-R Category	Code	RQ2: Challenges Faced by Teachers	RQ3: Strategies to Manage Workload
Job Demands	Content Creation Workload	High time investment to create quizzes, activities, and adapt content to LMS platforms (P2, P3)	Use of AI to automate quizzes/summaries (P6); pre-made resources from Canva, Kahoot
	Tech Literacy & Learning Curve	Difficulty due to lack of digital skills; trial-and-error approach to new tools (P2, P5, P8)	Continuous upskilling; modular, longer training; peer support; integrated systems (P2, P7)
	Student Management & Distraction	Students multitasking during lessons; control challenges in tech-based settings (P10)	Structured use of laptops (turning off when needed), proactive classroom management (P7)
	Technical & Infrastructure Issues	Tech breakdowns, slow internet, device limitations, interruptions during class (P1, P4, P9)	Backup plans (P1); improved infrastructure (P9); smart school platforms (2); IT support (P5)
	Collaboration & Communication Load	Feelings of isolation; need to coordinate across departments and give feedback (P2, P5)	Regular colleague discussions; peer observations; resource-sharing via online platforms (P3, P10)

JD-R Category	Code	RQ2: Challenges Faced by Teachers	RQ3: Strategies to Manage Workload
	Emotional & Mental Load	Stress, frustration from unpredictability, tech problems, student disengagement (P4, P5)	Mindfulness, meditation (P6); school policies that support wellbeing; no-emails-on-weekends (P4, P10)
	Assessment & Feedback	Time-consuming grading, lack of tools to provide feedback efficiently (P3, P4, P6)	Automated tools for quizzes and feedback: Book Widgets, ChatGPT; formative tools like Kahoot
	Time Management	Struggling with to-do lists; lack of training in prioritization (P5); short, insufficient training	Use of planning tools like Seesaw, Google Calendar, to-do apps; modular PD; organized file systems

In terms of enhancing job resources (see **Table 6**), peer collaboration emerged as a critical support mechanism. Teachers reduced feelings of isolation by engaging in regular discussions, peer observations, and collaborative lesson design using tools like Microsoft Teams and Digipad (P3, P10). Organizational support was also key, with calls for reliable IT personnel, designated tech-support staff, and streamlined digital ecosystems (P2, P7). Professional development was identified as a pivotal area for improvement; teachers advocated for longer, modular, and hands-on training formats that directly apply to classroom scenarios, particularly involving AI tools like ChatGPT and interactive video plugins (P6, P7). Moreover, teachers emphasized the need for greater autonomy and recognition in adopting BL tools, proposing policies that promote work-life balance and leadership strategies that validate teacher innovation and initiative (P4, P10). Together, these strategies reflect an adaptive and resourceful response by teachers to the multidimensional demands of blended learning environments.

Table 6: Identified coping strategies regarding Job resources in managing teachers' workload in BL

JD-R Category	Code	RQ2: Challenges Faced by Teachers	RQ3: Strategies to Enhance Resources
Job Resources	Peer Support & Collaboration	Feelings of isolation; minimal peer interaction in BL implementation (P2)	Regular colleague discussions; peer learning via lesson observations (P3); online communities (P10)
		Lack of shared resources or common knowledge base (P5)	Use of collaboration tools like Teams and Digipad to share resources and co-create lessons
	Organizational Support	Absence of dedicated tech experts; unclear processes for getting help (P7)	Access to reliable IT support; assigning tech-savvy staff to support teachers (P7); smart school tools
		Teachers feel alone in navigating BL without institutional help (P2)	Smart school integration to streamline access to materials and reduce workload (P2)
	Professional Development	Training too short or too shallow; not applicable to real-life classroom issues (P5)	Modular, skill-focused PD; longer sessions; opportunities for hands-on training and progression (P7)
		Lack of AI training despite relevance to BL tasks (P2)	Introduction of AI tools in PD; hands-on use of tools like ChatGPT and video quiz plug-ins (P6)
	Autonomy & Recognition	Low control over tool choice; lack of recognition from leadership (P4)	Policies promoting work-life balance (e.g., no weekend email); leadership support for teacher autonomy
		Hesitation or doubt about switching to tech due to lack of encouragement (P10)	Creating a culture of trust and independence in tech adoption; celebrating innovation (P10)

5. Discussions

The main results of the study show that BL has the potential for both increasing and decreasing teacher workload. There are also identified specific challenges and workload management strategies. These results support and supplement the literature already available on the topic, while also bringing out gaps and providing novel perspectives that have rarely been addressed before.

5.1 Perceived Workload Changes in BL (RQ1)

5.1.1 Increased workload (job demands)

Teachers in blended learning (BL) environments report a substantial rise in workload, particularly due to intensified task complexity, cognitive demands, and technological pressures. The creation of digital content, including assessments, lesson materials, and instructional videos, emerges as a significant task demand that demands high cognitive and time investment. This aligns with previous literature emphasizing that BL implementation involves complex, multi-level instructional efforts (Timperley & Robinson, 2000). Increased technological demands are also evident, particularly in the need to navigate diverse platforms, troubleshoot technical issues, and respond to students' varying digital competencies. Teachers must often provide real-time support to students lacking digital skills, compounding the pressure on instructional time (MacIntyre, Gregersen, & Mercer, 2020). This finding supports prior research on how student diversity, especially in terms of technological literacy, contributes to teacher workload (Schipor & Duca, 2021). Moreover, emotional demands are elevated in BL contexts. Teachers experience heightened stress when classroom control diminishes due to digital distractions, and when unanticipated technical breakdowns derail lessons. Some participants reported a sense of being "always on", juggling multiple roles without clear boundaries between instruction, IT support, and emotional caregiving. The strain is intensified by insufficient organizational support, such as the absence of onsite tech experts and inadequate training tailored to the realities of BL instruction. A notable finding underexplored in existing literature is the removal of traditional textbooks in some schools, requiring teachers to create all course content from scratch (P7). This substitution of core instructional materials with teacher-generated digital content significantly magnifies their workload and highlights a unique material challenge within certain BL contexts.

5.1.2 Decreased workload (job resources)

Despite these pressures, teachers also identify key job resources within the BL environment that can alleviate workload when effectively utilized. Most notably, the integration of digital tools and platforms offers opportunities for automation, planning, and instructional efficiency. Tools like Kahoot, BookWidgets, and Seesaw reduce the time needed for grading, feedback, and lesson design. This corroborates Kumar et al.'s (2021) findings that automation in administrative tasks can allow teachers to redirect time and energy toward instructional quality. The availability of pre-made resources and AI-supported tools (e.g., auto-grading, quiz generation, translation) further enables teachers to streamline content creation and differentiation (Alkhayat et al., 2022). These tools support adaptive instruction by facilitating adjustments for language needs, special education support, and various learning styles, functions that would otherwise require considerable effort (Kumar et al., 2021). Another crucial resource is the use of centralized platforms (e.g., Smart School, Teams) that consolidate access to learning materials, student submissions, and communication tools. Such platforms enhance organizational efficiency, reducing the cognitive load involved in managing multiple systems. From a collaboration and communication perspective, peer observation, digital communities, and school policies (e.g., no emails on weekends) contribute to a sense of support and autonomy, helping teachers manage the emotional toll of their workload. As shown in studies by Bishop and Verleger (2013) and Sari & Hermawan (2022), these collaborative systems promote self-directed learning among students, thereby shifting some responsibility for learning away from the teacher and reducing direct oversight demands.

5.2 Workload Challenges When Implementing BL (RQ2)

The findings underscore a multifaceted set of job demands that significantly impact teachers working in blended learning (BL) contexts. Teachers face heightened cognitive and emotional strain due to inadequate technological literacy, insufficient time management strategies, and the need to manage student behavior in digital settings, particularly the issue of off-task laptop use. These challenges align with prior research indicating that digital integration can provoke discomfort and cognitive overload, especially when teachers are expected to design, deliver, and troubleshoot technology-enhanced instruction with limited preparation (Baran & Correia, 2014; Rasheed, Kamsin, & Abdullah, 2020). Furthermore, emotional demands emerge from feelings of professional isolation and limited inter-collegial support, exacerbated by a lack of effective collaboration platforms. The resistance to adopting a BL mindset, noted by participants and consistent with Lightner and Lightner-Laws (2023), further highlights the need for psychological and pedagogical shifts that go beyond technical skills.

To address these demands, the research identifies a clear need for job resources that include targeted professional development, peer support, and structural investments. Participants emphasized that sustained improvements in digital proficiency and pedagogical confidence resulted from comprehensive training, echoing

Zhao and Song's (2021) call for continuous, context-specific professional development. Teachers also advocated for expanded digital literacy programs that address advanced instructional applications, not merely basic skills (Ali et al., 2005). Importantly, the need for infrastructure and financial support emerged as critical, participants stressed the importance of reliable internet, centralized platforms, and access to quality digital resources. Beyond material needs, teachers pointed to the motivational value of emotional support and recognition from leadership (Cheng, Zhu, & Dinh, 2024), reinforcing prior findings that perceived organizational support enhances teacher well-being and job satisfaction in technology-rich environments (Zhao & Song, 2021). Collectively, these findings support a JD-R perspective that effective workload management in BL requires not only the reduction of demands but also the strategic enhancement of resources across individual, interpersonal, and institutional levels.

5.3 Strategies for Managing Workload in BL (RQ3)

Based on the findings regarding RQ3, teachers in blended learning (BL) settings employ a variety of strategies to mitigate workload, aligning with the Job Demands-Resources (JD-R) model by converting high-strain demands into manageable tasks using job resources. Key strategies include the automation of content creation and assessment via AI-powered tools (e.g., ChatGPT, Book Widgets), the integration of pre-made digital resources (e.g., Canva, Kahoot), and centralized platforms for planning and communication (e.g., Smart School, Teams). These tools reduce the cognitive and temporal demands placed on teachers by streamlining instructional planning and feedback delivery (Kumar et al., 2021; Alkhayat et al., 2022). Time management is further supported through digital scheduling tools such as Google Calendar and Seesaw, allowing for more efficient task organization and workload distribution.

Equally important are the social and emotional job resources that support teacher resilience and job satisfaction. Peer collaboration, via lesson observations, shared resource banks, and online communities, fosters a sense of professional belonging and reduces isolation, echoing research that underscores the value of collegial support in digital teaching contexts (Zhao & Song, 2021). In addition, schools that actively cultivate teacher well-being through mindfulness resources, clear boundaries (e.g., no weekend emails), and recognition of teacher autonomy report higher motivation and lower burnout risk (Baran & Correia, 2014; Sari & Hermawan, 2022). These findings highlight the critical role of institutional and technological support systems in transforming the BL model from a potential burden into a sustainable, enriching pedagogical framework.

6. Limitations

There are a few limitations to take into account. The limited sample size may affect the findings' applicability to other educational contexts. Future research can include more participants from other geological areas to increase the generalizability of the findings. Furthermore, when novel tools are developed, the findings may change due to the quick advancement of technology. In addition, how teacher's confidence is in BL can be affected by continuous training. By carrying out longitudinal studies to investigate the long-term impacts of BL on teachers' job satisfaction and retention, future research might solve these limitations.

7. Conclusion and Implications

This study illustrates how blended learning (BL) presents a dynamic balance of job demands and resources for teachers in the context of Belgian primary and secondary schools, as framed by the Job Demands-Resources (JD-R) model. The findings emphasize that the key to managing BL-related workload lies in providing sufficient support structures, enabling teachers to effectively navigate demands and maintain well-being. This confirms the JD-R model's utility in understanding teacher workload in BL environments and highlights the importance of balancing demands with resources to sustain quality teaching and teacher well-being (Bakker & Demerouti, 2007; Baran & Correia, 2014; Zhao & Song, 2021).

Theoretically, this study contributes to the broader understanding of workload management in technology-integrated pedagogies by applying the JD-R model to the context of blended learning. It demonstrates how BL introduces a unique constellation of stressors and supports that can either hinder or facilitate teacher performance depending on the surrounding institutional framework. This reinforces the need to conceptualize teacher workload not only as a function of task quantity, but also of task complexity, autonomy, and resource availability (Schaufeli & Taris, 2014). Moreover, the study extends prior work by identifying digital infrastructure, peer support, and strategic professional development as critical resources that can mediate the impact of elevated demands. These findings underscore the importance of job design that considers not only the technical but also the emotional and cognitive aspects of teaching in BL settings.

Practically, the findings point to targeted implications for school leadership, teacher professional development, and education policy, particularly within the Belgian context of increasing school autonomy and ongoing digital transformation. At the school level, workload pressures associated with blended learning (BL) can be alleviated through structured professional development that is sustained over time rather than delivered as one-off workshops. For example, schools could allocate a minimum number of annual professional development hours specifically to blended instructional design, digital assessment practices, and time-management strategies, complemented by structured peer-mentoring or coaching models during BL implementation phases (Ali et al., 2005; Zhao & Song, 2021). Reducing teaching loads or reallocating non-instructional duties during transitional periods may further enable teachers to redesign courses without exacerbating strain. Embedding co-planning sessions, aligned with Belgium's collective bargaining frameworks reducing teaching loads during BL transitions, and adopting user-friendly platforms for automated tasks can support collaboration and reduce duplicated preparation work. Simultaneously, students must be trained to engage responsibly with digital tools, may help mitigate behavioral and monitoring demands placed on teachers in BL environments. From a policy perspective, the findings suggest the need to align BL initiatives with broader digital education strategies in Belgium, including investments in infrastructure, clear quality standards for blended instruction, and policy guidance that explicitly recognizes workload implications. Leadership practices should operationalize teacher well-being (Cheng, Caliskan, & Zhu, 2023; Cheng & Zhu, 2025) by embedding mental health resources, protected non-teaching time, and regular workload monitoring into school improvement plans.

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References

Ali, N. S., Hodson-Carlton, K., Ryan, M., Flowers, J., Rose, M. A. and Wayda, V., 2005. Online Education: needs assessment for faculty development. *Journal of Continuing Education in Nursing*, *36*(1), 32–38. https://doi.org/10.3928/0022-0124-20050101-09

Alkhayat, R. Y. Y., Alobaydi, E. K. A., Abdullah, O. M. and Arshad, M. R. H. M., 2022. *Efficiency and Effectiveness in Utilizing Blended Learning in Context Aware Ubiquitous Learning Systems*. https://doi.org/10.1109/iccitm56309.2022.10031656

Bakker, A. B. and Demerouti, E., 2007. The Job Demands–Resources model: State of the art. *Journal of Managerial Psychology*, 22(3), 309–328. https://doi.org/10.1108/02683940710733115

Bakker, A. B. and Demerouti, E., 2017. Job demands–resources theory: Taking stock and looking forward. *Journal of Occupational Health Psychology*, 22(3), 273–285. https://doi.org/10.1037/ocp0000056

Baran, E. and Correia, A., 2014. A professional development framework for online teaching. *TechTrends*, *58*(5), 95–101. https://doi.org/10.1007/s11528-014-0791-0

Batista-Toledo, S., and Gavilan, D., 2025. A Blended Learning Future: COVID-19 Lessons for "Phygital" Higher Education. *The International Review of Research in Open and Distributed Learning*, *26*(2), 1–22. https://doi.org/10.19173/irrodl.v26i2.8259

Birt, L., Scott, S., Cavers, D., Campbell, C. and Walter, F., 2016. Member checking and peer debriefing: Challenges and practical guidance in a qualitative study. *Qualitative Health Research*, 26(13), 1802–1811. https://doi.org/10.1177/1049732316654870

Bishop, J. L. and Verleger, M. A., 2013. The Flipped Classroom: A Survey of the Research. 120th American Society for Engineering Education Annual Conference and Exposition, 30, 1-18.

Bonk, C. J. and Graham, C. R. (Eds.)., 2012. *The handbook of blended learning: Global perspectives, local designs*. Wiley.

Bower, M., Dalgarno, B., Kennedy, G., Lee, M. J. W. and Kenney, J., 2015. Design and implementation factors in blended synchronous learning environments: Outcomes from a cross-case analysis. *Computers & Education*, *86*, 1–17. https://doi.org/10.1016/j.compedu.2015.03.006

Braun, V. and Clarke, V., 2006. Using thematic analysis in psychology. *Qualitative Research in Psychology* 3(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Cheng, Z., & Zhu, C. (2025). Academics' Leadership Styles and Their Motivation to Participate in a Leadership Training Program in the Digital Era. Education Sciences, 15(3), 369. https://doi.org/10.3390/educsci15030369

Cheng, Z., Caliskan, A., & Zhu, C. (2023). Academics' motivation for joining an educational leadership training programme and their perceived effectiveness: Insights from an EU-China cooperative project, *European Journal of Education*, 59(1), e12576. https://doi.org/10.1111/ejed.12576

Cheng, Z., Zhu, C., & Dinh, N. B. K. (2024). Perceived changes in transformational leadership : The role of motivation and perceived skills in educational leadership training under an EU-China cooperation project, *European Journal of Education*, 59(3), e12636. https://doi.org/10.1111/ejed.12636

Creagh, S., Thompson, G., Mockler, N., Stacey, M. and Hogan, A., 2023. Workload, work intensification and time poverty for teachers and school leaders: a systematic research synthesis. *Educational Review*, 77(2), 661–680. https://doi.org/10.1080/00131911.2023.2196607

Creswell, J. W., 2009. *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. Thousand Oaks, CA: SAGE Publications.

Crews, T. B., Wilkinson, K., Hemby, K. V., McCannon, M. and Wiedmaier, C., 2008. Workload Management Strategies for online Educators. *The Delta Pi Epsilon Journal*, *50*(3), 132–149. https://eric.ed.gov/?id=EJ837821

Davis, H. C. and Fill, K., 2007. Embedding blended learning in a university's teaching culture: Experiences and reflections. *British Journal of Educational Technology*, *38*(5), 817–828. https://doi.org/10.1111/j.1467-8535.2007.00756.x

Demerouti, E., Bakker, A. B., Nachreiner, F. and Schaufeli, W. B., 2001. The Job Demands–Resources model of burnout. *Journal of Applied Psychology*, 86(3), 499–512. https://doi.org/10.1037/0021-9010.86.3.499

European Schoolnet & University of Liège., 2012. Survey of Schools: Ict in Education. In *Country Profile: Belgium* (p. 2). https://ec.europa.eu/information_society/newsroom/image/document/2018-3/belgium_country_profile_2EE307B9-9C76-0A82-243BA9ACDA3891E4_49427.pdf

Feng, X., Wang, R. and Wu, J., 2018. A literature review on blended learning: Based on analytical framework of blended learning. *Distance Education*, *36(3)*, 13–24. https://doi.org/10.15881/j.cnki.cn33-1304/g4.2018.03.002

Flemish Ministry of Education., 2021. *Digisprong: Digitalisation strategy for Flemish education*. Government of Flanders.

Garone, A., Bruggeman, B., Philipsen, B., Pynoo, B., Tondeur, J. and Struyven, K., 2022. Evaluating professional development for blended learning in higher education: a synresearch of qualitative evidence. *Education and Information Technologies*, *27*(6), 7599–7628. https://doi.org/10.1007/s10639-022-10928-6

Glomann, L., Hager, V., Lukas, C. A. and Berking, M., 2018. Patient-Centered design of an e-Mental health app. In *Advances in intelligent systems and computing* (pp. 264–271). https://doi.org/10.1007/978-3-319-94229-2_25

Hill, J. D. and Smith, K., 2023. Visions of blended learning: identifying the challenges and opportunities in shaping institutional approaches to blended learning in higher education. *Technology, Pedagogy and Education*, *32*(3), 289–303. https://doi.org/10.1080/1475939x.2023.2176916

Kumar, A., Krishnamurthi, R., Bhatia, S., Kaushik, K., Ahuja, N. J., Nayyar, A. and Masud, M., 2021. Blended Learning Tools and Practices: A Comprehensive analysis. *IEEE Access*, *9*, 85151–85197. https://doi.org/10.1109/access.2021.3085844

LeBlanc, P., 2020. COVID-19 has thrust universities into online learning—How should they adapt? Education Plus Development, Brooking. https://www.brookings.edu/blog/education-plus-development/

Liao, H., Qu, Z., Yang, L., Wang, H., and Lin, Q., 2025. Typological analysis of teachers' self-regulation based on conservation of resources theory: A new perspective on the success of blended instruction. *Education and Information Technologies*, *30*(1), 1191–1217. https://doi.org/10.1007/s10639-024-13171-3

Lightner, C. A. and Lightner-Laws, C. A., 2013. A blended model: simultaneously teaching a quantitative course traditionally, online, and remotely. *Interactive Learning Environments*, *24*(1), 224–238. https://doi.org/10.1080/10494820.2013.841262

Lincoln, Y. S. and Guba, E. G., 1985. Naturalistic inquiry. SAGE Publications.

MacIntyre, P. D., Gregersen, T. and Mercer, S., 2020. Language teachers' coping strategies during the Covid-19 conversion to online teaching: Correlations with stress, wellbeing and negative emotions. *System*, *94*, 102352. https://doi.org/10.1016/j.system.2020.102352

Mendoza, A., 2023. Workload, stress, and coping strategies in special education BL environments. *International Journal of Inclusive Education*, 27(5), 512–529.

Mendoza, K. C., 2023. Blended learning in special education: Teachers' challenges and coping mechanisms. *International Journal of Education and Practice*, 11(3), 455–467. https://doi.org/10.18488/61.v11i3.3436

Mintii, I. S., 2023. Blended learning: definition, concept, and relevance. *Osvìtnìj Vimìr*, *8*, 85–111. https://doi.org/10.31812/ed.539

Moustakas, C., 1994. *Phenomenological Research Methods*. Thousand Oaks, CA: SAGE Publications.

Radovan, M., and Radovan, D. M., 2024. Harmonizing Pedagogy and Technology: Insights into Teaching Approaches That Foster Sustainable Motivation and Efficiency in Blended Learning. *Sustainability*, *16*(7), 2704. https://doi.org/10.3390/su16072704

Rasheed, R. A., Kamsin, A. and Abdullah, N. A., 2020. Challenges in the online component of blended learning: A systematic review. *Computers & Education*, 144, 103701. https://doi.org/10.1016/j.compedu.2019.103701

Sari, R. Y. and Hermawan, H., 2022. The effect of Blended Learning and Teacher-Student Interaction on the learning motivation of SMAN 1 Depok City students. *International Journal of Educational Technology and Learning*, *13*(2), 35–41. https://doi.org/10.55217/101.v13i2.584

Schipor, M.-D. and Duca, D.-S., 2021. On-site vs Online Teaching: Challenges and Coping Strategies. *Revista Romaneasca Pentru Educatie Multidimensionala, 13*(1Sup1). https://doi.org/10.18662/rrem/13.1Sup1/388

Shahkarami, F., Taghavi, A. A., Dolama, R. H., Khajavirad, N., Mirzazadeh, A., and Gandomkar, R., 2025. Students' and faculty members' perceptions of the online component of a blended internal medicine clerkship course: A mixed-method evaluation. *BMC Medical Education*, *25*(1), 1221. https://doi.org/10.1186/s12909-025-07812-5

Timperley, H. and Robinson, V., 2000. Workload and the professional culture of teachers. *Educational Management & Administration*, 28(1), 47–62. https://doi.org/10.1177/0263211x000281005

Wang, H., Sun, Y., Wang, W. and Liang, H., 2025. Exploring the relationship between teachers' perceived workload, challenge-hindrance stress, and work engagement: a person-centered approach. *BMC Psychol 13*, 201. https://doi.org/10.1186/s40359-025-02537-y

Zhao, S. and Song, J., 2021. What kind of support do teachers really need in a blended learning context? *Australasian Journal of Educational Technology*, 116–129. https://doi.org/10.14742/ajet.6592