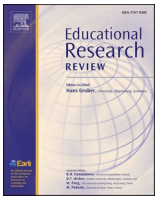
Educational Research Review 50 (2026) 100757

Contents lists available at ScienceDirect

Educational Research Review

journal homepage: www.elsevier.com/locate/edurev



Review

Professional learning of late-career teachers: A systematic literature review

Quentin Brouhier [a,*], Isabel Raemdonck [b], Virginie März [a]

[a] Faculty of Educational Sciences, Université Catholique de Louvain (UCLouvain), Belgium
[b] Faculty of Psychology, Speech Therapy, Sexology and Family Sciences, Université Catholique de Louvain (UCLouvain), Belgium

ARTICLE INFO

Keywords:
Late-career teachers
Teacher professional learning
JD-R model
Systematic literature review

ABSTRACT

Although professional development has been widely studied, the professional learning of late-career teachers remains an underexplored area. This mixed-methods systematic review synthesises findings from 12 peer-reviewed studies published between 2000 and 2024, focusing on teachers aged 50 and above. The analysis, structured around the Job Demands-Resources model, examined how professional learning is defined, experienced and supported in the later stages of teaching careers. The findings revealed significant inconsistencies in how late-career teachers are defined, whether by age, experience or perceived expertise, highlighting the lack of a coherent conceptualisation for this group. Similarly, professional learning was operationalised in various ways across studies, ranging from formal, structured programmes to informal, workplace-embedded practices. The review identifies late-career teachers' preference for socially embedded and collaborative learning opportunities, such as mentoring, dialogue and reflective practice. However, mentoring late-career teachers is typically seen as a one-way relationship where only the mentee learns, rather than as a shared learning experience in which both mentor and mentee grow together. Using the job demands-resources model, the review categorises key job demands (e.g., workload, role ambiguity) and resources (e.g., collegial support, autonomy, self-efficacy) that influence late-career teachers' engagement in learning. It highlights a notable gap in tailored interventions addressing their specific needs. The review concludes with both theoretical and practical implications, advocating for more nuanced, context-sensitive approaches to professional learning that value the continued growth, contributions and well-being of teachers in the later stages of their careers.

1. Introduction

In light of growing teacher shortages worldwide, educational systems are increasingly focused not only on recruiting new staff, but also on retaining currently employed professionals across all career stages. Sustaining the engagement and effectiveness of experienced teachers has become a critical priority, particularly as demographic shifts have led to an aging teaching workforce and a decline in the number of new teachers entering the profession (Organization for Economic Co-operation and Development, 2019). These developments are further shaped by rising life expectancy, higher statutory retirement ages and stricter early retirement regulations in many countries (Jakovljevic et al., 2021). Keeping late-career teachers (LCT) professionally active is now essential to ensuring

* Corresponding author. Place Cardinal Mercier 10/L3.05.01. 1348, Louvain-la-Neuve, Belgium.
E-mail address: quentin.brouhier@uclouvain.be (Q. Brouhier).

https://doi.org/10.1016/j.edurev.2025.100757
Received 13 June 2025; Received in revised form 4 December 2025; Accepted 5 December 2025
Available online 8 December 2025

institutional stability and pedagogical continuity. In this study, the term *late-career teachers* refers to educators typically aged 50 years and above and/or with more than 20 years of teaching experience, consistent with definitions adopted in prior research (e.g., Brouhier et al., 2023; Monteiro et al., 2020). This dual criterion reflects both chronological age and career stage, recognising that professional seniority and age do not always coincide (e.g., a 50-year-old novice versus a 48-year-old teacher with two decades of experience). The conceptual use of the term LCT in this review thus captures teachers who are approaching the final phase of their professional trajectory, irrespective of national differences in career structure or retirement policy. Comparable frameworks have been used across European, North American and Oceanian contexts, supporting its relevance as a cross-national analytical category (see Babic et al., 2022; Forde & McMahon, 2019; Gore & Rickards, 2021).

However, working longer is not without challenges. LCT often face increased risks of burnout, emotional fatigue and premature exit from the profession (Garcia-Arroyo et al., 2021; Ozamiz-Etxebarria et al., 2023). These difficulties are compounded by the complex and evolving nature of today's school environments, characterised by constant educational reform, rapid technological developments and growing social expectations (Economic Co-operation and Development, 2025; Heffernan et al., 2022; Organization for). Despite their experience and contributions, many LCT struggle to maintain motivation and well-being in the face of such systemic demands (Brouhier et al., 2023).

In this context of accelerated change, sustained participation in professional learning is widely recognised as a key factor in supporting teacher engagement, effectiveness and adaptability (Admiraal et al., 2019; Ben-Peretz et al., 2018). Lifelong learning has become central to educational policy across Europe (European Commission, 2002), yet engagement among LCT remains uneven. While European policy has foregrounded lifelong learning since the Lisbon Strategy, comparable emphases can be observed in other regions. In North America, continuous professional development has been embedded within teacher standards and accountability frameworks (Darling-Hammond et al., 2017; OECD, 2021). Similarly, across Asia and Oceania, lifelong learning has been linked to teacher retention and educational quality (Jensen et al., 2016). Accordingly, the present study interprets findings with attention to regional variation in policy frameworks, such as retirement age, professional development mandates, and workforce demography, that may shape LCT learning opportunities across contexts. Research has suggested that institutional support is often lacking, and LCT may face both practical and psychological barriers to participating in professional development (Eros, 2011; Zhang et al., 2020). Stereotypes portraying LCT as resistant to change or less capable of learning still persist (Gore & Rickards, 2021), despite evidence of their professional competence and willingness to grow (Orland-Barak, 2014).

In recent years, growing policy and research attention in many countries has been directed toward the importance of lifelong learning for teachers. Previous research has underscored the role of continuous professional learning in enhancing educational quality (Louws et al., 2017). However, the infrastructure needed to make such learning consistently accessible, sustained and meaningful remains unevenly developed across countries (Boeskens et al., 2020; European Commission, 2020). This is especially evident for LCT, who frequently receive less targeted support despite their key role in sustaining pedagogical stability and mentoring younger colleagues. While some systems, such as those in parts of Australia and selected U.S. states, have embedded professional learning into their career progression frameworks (e.g. Baker et al., 2018; Jaquith et al., 2011), participation in many European countries remains voluntary and inconsistently supported at the school level. Previous research has suggested that the engagement of LCT in professional learning is shaped by both workplace conditions and personal motivational resources (e.g. Admiraal et al., 2019; Jansen in de Wal et al., 2020). Yet, the ways in which these teachers interpret these conditions and respond to evolving learning demands remain insufficiently examined, particularly in light of persistent contextual barriers (Gore & Rickards, 2021). In addition, recent scholarship has stressed the need for an intersectional perspective when examining how these contextual and motivational factors shape the experiences of LCT, acknowledging the interplay of multiple identities and contextual conditions (Marcus, 2022).

To explore how these contextual and motivational factors interact, the present study draws on the Job Demands-Resources (JD-R) model (Bakker & Demerouti, 2017). This model distinguishes between job demands (e.g., workload, emotional strain), job resources (e.g., autonomy, collegial support) and personal resources (e.g., self-efficacy), offering a comprehensive view of the mechanisms that influence teacher engagement and professional learning. The JD-R model is particularly well-suited to the teaching profession, providing a valuable lens for understanding how LCT manage their development in environments that can either constrain or facilitate learning opportunities (Brouhier et al., 2023; Raemdonck et al., 2022). In adopting this lens, the present study addresses a critical research gap by focusing on the conditions that enable or impede teachers' meaningful engagement in learning during the later stages of their professional careers.

The JD-R model is adopted here because teaching involves high cognitive-emotional demands, strong situational variability, and tightly coupled social contexts, conditions under which the balance between demands, job resources, and personal resources has been shown to shape motivation and sustained engagement (Bakker & Demerouti, 2017). Although originally developed in organisational psychology and primarily applied to performance and well-being, the model is extended in this study to the domain of professional learning as a related process and outcome. Nonetheless, certain limitations are acknowledged: the JD-R model under-specifies multilevel, relational, and systemic dynamics, such as leadership, organisational culture, and policy alignment. Consequently, the model is used as a structuring analytical lens, complemented by frameworks from teacher professional learning (TPL) research to capture social, contextual, and identity-related mechanisms.

2. Previous reviews on LCT

Two pertinent literature reviews, both published prior to the present research, have explored either LCT or TPL individually. However, no specific literature review was identified that directly examined the intersection of these two areas. The first review, conducted by Postholm (2012), investigated how experienced teachers engage in learning throughout their careers and apply this

learning to support pupils' academic development. This theoretical article, based on a search of the ISI Web of Science database, reviewed 31 articles published between 2009 and 2011. Postholm highlighted the importance of collaboration with colleagues and school leaders as a vital form of social learning for experienced teachers, which in turn enhances teaching practice and benefits pupils' learning. The article also emphasised the significance of one particular job resource: the capacity of schools to create either structured or semi-structured opportunities for sharing problems and practices, with joint reflection identified as an essential driver of professional learning.

The second review, conducted by Torenbeek and Peters (2017), synthesised research on the attrition and effectiveness of teachers with over 20 years of experience. Using the JD-R model, the authors categorised the specific demands and resources encountered by experienced teachers. They documented perceived job demands, such as disruptive student behaviour, high workload, evolving teaching roles and additional out-of-classroom responsibilities. Key job resources included social and leadership support and an innovative climate, while personal resources, such as perceived control and self-efficacy, were also considered crucial for professional sustainability. The authors underscored the scarcity of studies addressing organisational commitment among LCT and highlighted the need for further examination of personal resources within this context.

Compared with Postholm (2012), the present review focuses specifically on late-career teacher cohorts and examines professional learning through the lens of the Job Demands–Resources (JD–R) model. This extends Postholm's emphasis on collegial and social forms of learning by situating them within broader configurations of job demands, job resources, and personal resources. In contrast to Torenbeek and Peters (2017), whose review centred on attrition and effectiveness, the current synthesis expands the scope to include multiple forms of professional learning, such as mentoring, professional learning communities, and informal workplace learning, and to propose a conceptual and operational definition of late-career teachers. Overlap in primary studies between the two earlier reviews and the present analysis appears minimal, reflecting differences in time span, inclusion criteria, and analytical focus.

3. Theoretical framework

The JD-R model (Bakker & Demerouti, 2017) provides a robust and flexible framework for analysing how workplace conditions affect TPL. By emphasizing the interplay between job demands, job resources and personal resources, the model captures the complex factors shaping engagement in professional learning. Research has shown that certain job demands, such as task complexity, can serve as motivational drivers, encouraging the development of new skills and strategies (LePine et al., 2005), while job resources, such as autonomy, feedback and collegial support, create enabling conditions for sustained learning (Evers et al., 2016). This dynamic, bidirectional relationship positions workplace learning as an active, context-sensitive process rather than a passive reaction to external pressures. The model's relevance is especially evident in teaching, where balancing increased responsibilities with adequate support is essential for sustaining growth and motivation throughout one's career (Granziera et al., 2021).

The JD-R model also aligns conceptually with key findings in TPL research, particularly those regarding engagement, motivation and proactivity. Engagement is widely recognised as a driver of learning and achievement (Greene, 2015; Pekrun & Linnenbrink-Garcia, 2012), and more recent research has emphasised a "person-in-context" approach that highlights the interaction between individual and environmental factors (Schmidt et al., 2018). This perspective closely mirrors the JD-R model's core assumptions. Furthermore, theories of job crafting and active learning suggest that employees who proactively engage in learning also shape their own work conditions, thereby reinforcing a virtuous cycle of motivation and development (de Lange et al., 2010; F. Zhang & Parker, 2019). In the teaching profession, this self-sustaining cycle not only supports teachers' ongoing development, but also benefits student outcomes, as teacher well-being and growth have been shown to positively influence their classroom practices (Jeon et al., 2019). Finally, professional development programmes play a central role in supporting teachers' capacity to navigate job demands, manage stress and respond effectively to learners' needs (Smith & Lawrence, 2019), making the JD-R model an especially suitable lens for examining TPL processes. The following sections present the two analytical frameworks used in this study.

3.1. JD-R model

In the past, numerous theories about work-related stressors and well-being have been developed, in which causes and outcomes are conceptually integrated and ordered into a causal pattern of relationships. Among them, the JD–R model, developed by Demerouti et al. (2001), emphasizes the effect not only of demands, but also of resources on employees' professional learning and development. This model has also been applied to the teaching profession (see Dicke et al., 2018). According to the model, each organization has its own specific circumstances and risks that are associated with job-related benefits or stressors. The model divides these work characteristics into two sets: job demands and job resources. *Job demands* refer to physical, cognitive and emotional efforts or skills that are associated with physiological and/or psychological costs and are required as part of the job. *Job resources* refer to physical, psychological, social or organizational aspects of the work environment that are functional for achieving work goals and reduce job demands and their associated physiological and psychological costs (Bakker et al., 2023). Both job resources and job demands can stimulate personal growth, learning and development to some extent (Evers et al., 2016). Two independent processes are at play in the JD–R model and both play a role in the development of strain and exhausting conditions or well-being and work engagement. In the first process, chronic job demands drain employees' mental and physical resources and may lead to depletion of energy and health problems. The second process, whereby resources have a motivational potential even under higher demands, leads to high work engagement, low cynicism, personal growth and good performance (Bakker & Demerouti, 2017).

An important extension of this model concerns the inclusion of *personal resources*, which consist of individuals' sense of their abilities to successfully control and have an impact on their environment (Hobfoll et al., 2003). Most behavioural theories assume that

human behaviour results from an interaction between personal and environmental factors (Demerouti et al., 2001). People seek to obtain, retain and protect resources, and stress occurs when these resources are threatened (Hobfoll, 2002). Personal resources can therefore fulfil a central motivational role (Xanthopoulou et al., 2007) and have an important function in participation in professional development activities (Brouhier et al., 2023; van der Heijden et al., 2015). When confronted with age-related changes, maintaining these personal resources might be very important for LCT (Carstensen & de Lang, 1996), even more in an activity such as teaching, where the quality of the performance greatly depends on the teacher's mood (Ariza-Montes et al., 2016).

3.2. TPL

TPL is widely recognised as a cornerstone of educational quality, influencing both instructional practices and teacher retention (Koerber et al., 2023; Mertler, 2016). In the literature, TPL is broadly understood as encompassing a range of activities or experiences, both individual and collaborative, through which teachers acquire and develop professional knowledge, skills and dispositions (Avalos, 2011). Evers et al. (2016), building on Kwakman's (2003) earlier framework, proposed five theoretical dimensions of professional learning that reflect the diverse ways teachers engage in development: (1) keeping up to date with new knowledge, (2) experimenting with practice, (3) reflecting and seeking feedback, (4) collaborating with colleagues for lesson improvement and (5) contributing to school-wide development. This multidimensional approach captures the complex and iterative nature of teacher learning.

To further conceptualise how learning occurs, previous research has expanded the scope of TPL to include both formal and informal dimensions. Kyndt et al. (2016) advocated viewing professional learning as a continuum, rather than a dichotomy. While traditional forms of learning were confined to structured, external training sessions, informal learning, emerging organically through daily work practices and social interactions, is now recognised as equally significant (Smet et al., 2022). This view was echoed by Enthoven et al. (2024), who conceptualised professional learning as a 'landscape' shaped by teachers' movement across multiple communities of practice. Learning thus emerges as a participatory and situated process, rooted in ongoing professional engagement rather than discrete events.

This growing recognition of professional learning as a situated, participatory process underscores the need for frameworks that capture its multidimensional and context-sensitive nature. The present review embraces this perspective by adopting both the five-dimensional model of Evers et al. (2015) and the formal-informal learning continuum developed by Kyndt et al. (2016). Together, these frameworks provide a comprehensive lens for identifying the learning activities of LCT, who often navigate diverse and overlapping forms of learning across the career span. Complementing these multidimensional and process-oriented models, Hunzicker's (2011) checklist (see Appendix C) provides a practical framework for identifying the contextual conditions that make professional learning meaningful. It emphasizes five interrelated features, supportive, ongoing, job-embedded, collaborative, and responsive to teachers' needs, that together define effective professional learning environments. While originally formulated in a general teaching context, these criteria offer a useful benchmark for evaluating how late-career professional learning is enabled or constrained in practice.

By integrating these conceptual tools, the study examines not only the nature and forms of TPL, but also the contexts in which it occurs, ranging from formal training to informal workplace learning. Given the importance of learning through everyday practice and the relative paucity of research on how LCT experience such learning, this systematic literature review focuses specifically on teachers aged 50 and above. It seeks to synthesise current findings and identify future research directions by addressing the following research questions:

1. How have LCT been defined in the literature, providing conceptual grounding for subsequent analyses?
2. What constitutes professional development of LCT? In what types of learning activities do they engage?
3. In terms of the JD-R model, what job demands have been reported as impediments to and motivators of learning? What personal resources and job resources contribute to the learning and professional development of LCT?
4. What outcomes have been examined in relation to professional learning by LCT?

4. Methods

4.1. Mixed-methods systematic literature review

By including different forms of evidence from both qualitative and quantitative studies, this review followed the principles of mixed-methods systematic reviews. In this regard, Sandelowski et al. (2012) outlined a general framework for mixed-methods systematic reviews, identifying several possible synthesis designs. Among these, this study adopted what Heyvaert et al. (2016) refer to as a *single data-based convergent synthesis design*, an integrated methodology that assimilates qualitative and quantitative data into a single dataset, analyses them using the same method (typically thematic or content analysis), and reports the results jointly (Noyes et al., 2019). To operationalise this design, the procedures described by Pearson et al. (2015) were applied. These recommend transforming quantitative findings into qualitative themes through data extraction and coding. This process aligns with the meta-summary technique outlined by Sandelowski and Barroso (2003) and further refined by Draucker et al. (2009), whereby all data, regardless of origin, are synthesised narratively and thematically. Furthermore, consistent with the typology developed by Sandelowski et al. (2012), this review adopted a study-level rather than a participant-level approach. As these authors noted, qualitative findings are typically reported at the study level, with emphasis on thematic and interpretive syntheses rather than frequency counts or cross-participant

comparisons (p. 228). Consequently, the integration of qualitative and quantitative findings in this review also occurred only at the study level.

4.2. Literature search and screening

This research followed the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines to improve the reporting of the literature review (Rethlefsen et al., 2021), and used a four-phase flow diagram (Moher et al., 2009). The present research focused on literature from four electronic databases (Eric, PsycInfo, Scopus and Francis), selected for their extensive coverage of education and applied psychology and considered as most relevant in educational research. Literature searches were carried out between April and June 2024. Keywords identified for the search categories were "late-career teachers" and "professional development" (plus the derivative terms). The time boundaries for publications whose titles, abstracts or keywords contained these terms were between 2000 and 2024. We opted for this specific timeframe, as learning and development (i.e., lifelong learning) in the teaching profession has become a predominant issue in the educational context since the acceptance of the Lisbon Agreements (Education Commission, 2002) and since it was identified as a key mechanism for improving classroom instruction and student achievement (National Commission on Teaching and America's Future, 1996). The search strategy was intentionally designed to balance breadth and conceptual precision. While the inclusion of broader or more generic terms (e.g., "experienced teachers" without age or career criteria) might have yielded a higher number of studies, it would also have reduced the analytical focus of the review. The goal was not to capture all research mentioning older teachers, but rather to synthesise empirical evidence explicitly addressing professional learning in the late-career phase. Therefore, the terminology used in the search strings privileged conceptual specificity ("late-career," "veteran," "senior teachers," "teachers aged 50+") over generality. Similarly, the inclusion and exclusion criteria were formulated to ensure that all retained studies foregrounded LCT as their primary analytical focus. We acknowledge that this strategy may have limited the total number of retrieved studies, but it strengthened internal coherence and comparability across the selected corpus. This decision aligns with established guidance on mixed-methods systematic reviews, which emphasizes conceptual alignment and transparency over numerical breadth (Heyvaert et al., 2016; Noyes et al., 2019).

During the first stage of the study, research syntaxes were formulated by expert librarians (see Appendix A for our research syntaxes). Studies were included if they met the following criteria: publication source (peer-reviewed academic journal), the nature of the study (empirical), the relevance of the topic (relating in a direct or implicit way to older teachers and professional development) and the nature of the sample (teacher sample aged 50 years or older **and** with at least 20 years of experience). This intersectional criterion (aged 50 years **and** with at least 20 years of professional experience) was deliberately chosen to capture teachers who are both chronologically and experientially situated in the late-career phase, ensuring conceptual alignment with established career-stage frameworks (e.g., Brouhier et al., 2023; Huberman, 1989). In the same vein, the exclusion criteria eliminated studies concerning student and pre-service teachers; research on higher education and special education was excluded, to focus on pre-school, primary and secondary education. Conference papers, national and international reports, conference proceedings, books, book chapters, and grey literature were also excluded. The inclusion and exclusion criteria defined for the selection of articles are presented in Table 1.

Out of the initial 4276 items, one researcher (Author 1) removed the duplicates and scrutinized the titles and abstracts of the remaining 3632 to determine which studies appeared to meet the inclusion criteria. Based on the literature search, numerous articles were identified in which LCT were included as part of a broader group of experienced teachers. However, these articles often did not specifically address the particularities of LCT and their learning processes and were therefore excluded from the final selection. This first stage resulted in 292 eligible items. To assess the reliability of the screening process, Authors 2 and 3 independently reviewed a random sample of 10 % of the titles and abstracts, blinded to each other's decisions. Interrater agreement was assessed using Cohen's kappa method, a widely recommended coefficient for evaluating coder reliability (Park & Kim, 2015). The level of agreement was satisfactory ($k = 0.72$), supporting the reliability of the initial screening, which was therefore retained without further discussion of discrepancies.

Next, all 292 retained records underwent full-text screening, conducted by Authors 1, 2 and 3. During this phase, eligibility was assessed against all inclusion and exclusion criteria, and a critical appraisal procedure was applied to evaluate methodological quality using the Joanna Briggs Institute's QARI tool (Lockwood et al., 2015). Studies scoring 5 or below on the QARI checklist were excluded; in most cases, low scores reflected insufficient methodological reporting (e.g., missing details on data collection or ethical procedures)

Table 1
Inclusion and exclusion criteria.

Inclusion criteria	Exclusion criteria
1. Topic alignment with the RQs: The articles should be relevant for the features that characterize the professional learning of teachers with more than 19 years of experience AND aged 50 years old or more.	Out of the scope of the RQs
2. Publication type: All articles should be peer-reviewed journal articles.	Non peer-reviewed or non-article
3. Language: All articles should be written in English.	Articles not written in English
4. Context: All in-service teachers, corresponding to Criterion 1, working with non-adult students from kindergarten to secondary education were eligible for this research.	Teachers in higher education
5. Time period: Articles published between 2000 and 2024	Articles published before 2000

rather than explicit methodological flaws. Full-text exclusions were categorised according to four clearly defined criteria, now itemised in the PRISMA 2020 flow diagram (Appendix B): (1) ineligible population (e.g., teachers who did not meet late-career criteria or samples mixing professionals without separate analyses of LCT); (2) not aligned with the review topic or research questions (e.g., studies on teachers in general that did not specifically examine late-career teachers or their professional learning);

(3) not aligned with teacher professional learning (TPL) (e.g., studies involving LCT but focusing solely on retirement intentions, identity narratives, job satisfaction or other outcomes unrelated to learning processes); (4) insufficient methodological reporting, based on QARI criteria. Following this phase, six studies met all eligibility and quality criteria.

To address potential database limitations and strengthen coverage, an additional backward reference searching was conducted (Bryman, 2012). This complementary phase identified six further studies that met all inclusion and quality criteria and were subsequently integrated into the final dataset, resulting in a total of twelve articles included in the review (see Appendix B). While the initial Boolean search yielded only six studies meeting all predefined inclusion criteria, this outcome reflects the narrow empirical focus of the existing literature rather than an overly restrictive search strategy. The decision to use specific keywords (e.g., "late-career teachers", "professional development") was guided by the need to ensure conceptual alignment with the review questions and to avoid retrieving large numbers of studies outside the scope of compulsory education or not focused on workplace learning. Broader terms such as "older teachers" or "learning and development" were carefully evaluated; however, in several databases these terms predominantly retrieved research on general aging processes, non-teaching professions, or adult education contexts, which were outside the scope of this review. To mitigate this limitation and prevent missing relevant studies, we complemented the Boolean search with systematic backward reference searching from key anchor papers, which identified six additional eligible studies. This combination of targeted search terms, transparent exclusion criteria, and manual reference checking ensured comprehensive coverage while maintaining conceptual coherence.

4.3. Data extraction and analysis

The content of the articles was extracted in accordance with Pickering and Byrne's (2014) recommendations; an Excel spreadsheet was used to detail two types of extracted information. First, contextual data allowed us to conduct a descriptive analysis and to construct a summary table specifying the focus of each study, sample characteristics, methods used and main findings (see Table 2). Second, data related to the research focus were extracted through a thorough reading of the full-text articles, with particular attention given to elements aligned with the three components of the JD-R model.

Data extraction was initially conducted by Author 1 using a piloted extraction template. To enhance transparency and credibility, Authors 2 and 3 independently verified the extracted data for a purposive subset of four studies (one qualitative, one quantitative and two mixed-methods) and compared the extracted material with the original articles. This subset was intentionally selected to represent the methodological diversity of the corpus. Full double extraction of all 12 studies was not undertaken, consistent with established guidance for qualitative and mixed-methods evidence syntheses, where negotiated agreement among reviewers is prioritised over exhaustive duplicate extraction (Booth et al., 2021; Noyes et al., 2019). Discrepancies were discussed until consensus was reached,

Table 2
Overview of the selected articles.

N	Authors	Country	Methods	School level	Label	Definition	TPL activities
1	Brouhier et al. (2021)	Belgium	Mixed Methods	Secondary	End-of-career teachers	More than 55 years old	Networks of professional learning
2	Brouhier et al. (2023)	Belgium	Quantitative	Preschool	LCT	More than 50 years old and with more than 20 years of practice	Measuring engagement in TPL activities
3	Gore & Rickards (2021)	Australia	Qualitative	Primary	Teachers in late phase	More than 19 years of practice	Quality Teaching rounds
4	Hargreaves & Elhawary (2019)	Egypt	Qualitative	Primary	Senior teachers	No precise description	Teacher learning communities
5	Hollweck (2019)	Canada	Qualitative	All school levels	Veteran teachers	Min. 8 years of experience as mentor	Mentoring-coaching
6	Iancu-Haddad & Oplatka (2009)	Israel	Qualitative	All school levels	Teachers in late career stage	Over 55 years old	Mentoring
7	Leite et al. (2022)	Finland	Mixed Methods	All school levels	Experienced teachers	From 19 to 30 years of practice	Informal – pupil interactions
8	Meister (2010)	USA	Qualitative	Secondary school	Experienced teachers	Ranging from 21 to 28 years of practice	Perceptions of their accumulated skills
9	Monteiro et al. (2020)	Portugal	Qualitative	All school levels	Veteran teachers	Ranging from 50 to 62 years old and with 20 years of practice	Digital technologies practices
10	Morcom & MacCallum (2022)	Australia	Qualitative	All school levels	Experienced teachers	More than 25 years of practice	Mentoring
11	Robinson (2020)	Australia	Qualitative	Secondary school	Super veteran teachers	Over 30 years of practice	Perceptions of their TPL
12	Snow-Gerono (2009)	USA	Qualitative	Preschool and primary	Veteran teachers	No precise description	School-University Partnership

leading to minor refinements of the extraction template and shared definitions of key categories. This procedure ensured a common analytic understanding across the review team while maintaining methodological rigour.

Job demands, as well as contextual and personal resources identified in both qualitative and quantitative studies, were then coded using a common framework. The JD–R model served as a guiding structure for categorizing the data and constructing a meta-summary, with the aim of mapping the demands and resources found in the selected studies to prompt continuous professional learning. Rather than calculating formal interrater reliability coefficients for the thematic synthesis, the review team relied on iterative discussion and negotiated agreement, consistent with recommendations for interpretive mixed-methods reviews (Noyes et al., 2019; Sandelowski et al., 2012).

5. Results

5.1. Descriptive analysis

The final corpus for analysis comprised 12 peer-reviewed articles published between 2000 and 2024, sourced from 11 academic journals and covering research conducted in eight different countries. Most studies originated from Europe ($n = 5$) and North America ($n = 3$). In terms of methodology, nine studies employed qualitative designs, one adopted a quantitative approach and two used mixed methods. The sample sizes varied considerably, ranging from 4 to 300 LCT. All school levels were represented in the dataset. Notably, five studies examined teacher learning across grades K-12, rather than focusing on a single school level. Three studies concentrated on secondary education, two on primary education, one on preschool and one on preschool and primary.

Although the geographic distribution of studies may appear uneven, this pattern likely reflects a combination of demographic, policy and research-system factors rather than a bias in selection. Belgium, for instance, appears twice in the dataset, while the United States, despite its prominence in education research more broadly, is represented in only two studies. Several contextual explanations can be advanced. First, demographic and policy differences shape the salience of late-career teaching as a research topic: countries facing accelerated teacher aging and higher retirement ages (e.g., Belgium, Australia) have shown greater interest in sustaining late-career engagement. Second, variations in national research priorities and funding schemes may have directed attention toward workforce retention and teacher well-being in some regions more than others. Finally, this distribution may also stem from database indexing practices, as European studies in English are often overrepresented in multidisciplinary databases such as Scopus and ERIC. Together, these factors suggest that the geographic pattern observed reflects the structure of the research field rather than the exclusion of specific contexts.

Based on the research questions guiding this systematic review, three major areas were identified to structure the analysis: (1) the underlying conceptualisations used to define this teacher cohort (see Section 4.2); (2) the learning opportunities and activities LCT engaged in, shaped by contextual elements that either facilitated or hindered their professional learning (Section 4.3); and (3) the development of an analytical model to consolidate insights from the selected literature. This model provides the foundation for the narrative synthesis developed in Section 4.4, where the JD-R model is used to structure the analysis.

5.2. Defining LCT

The selected studies used a variety of terms to describe teachers in the later stages of their careers, reflecting an overall lack of terminological consensus in the literature. Among the 12 reviewed articles, four referred to these teachers as “veteran” or “super veteran teachers” (Hollweck, 2019; Monteiro et al., 2020; Robinson, 2020; Snow-Gerono, 2009), three used the label “experienced teachers” (Leite et al., 2022; Meister, 2010; Morcom & MacCallum, 2022) and another three adopted the term “late-career” (Brouhier et al., 2021, 2023; Iancu-Haddad & Oplatka, 2009). Other descriptors included “senior teachers” (Hargreaves & Elhawary, 2019), “teachers in the late phase” (Gore & Rickards, 2021) and “end-of-career teachers” (Brouhier et al., 2021).

To better understand how these terms were operationalised, we examined the inclusion criteria across the studies. Two main approaches emerged: years of experience and chronological age. Experience-based thresholds ranged widely, from as few as 8 years of experience as a mentor (Hollweck, 2019) to over 30 years of service (Robinson, 2020). Several studies defined LCT as those with 20 or more years of experience (Monteiro et al., 2020; Morcom & MacCallum, 2022; Snow-Gerono, 2009), while others included teachers with experience ranging from 19 to 30 years (Leite et al., 2022) or 21–28 years (Meister, 2010). A few studies used both age and experience criteria. For instance, Brouhier et al. (2023) included teachers over 50 years old with more than 20 years of practice, while Monteiro et al. (2020) targeted teachers 50–62 years old with at least 20 years of experience. Chronological age alone was used in three studies, with cut-offs set at over 50 (Gore & Rickards, 2021), over 55 (Iancu-Haddad & Oplatka, 2009) and between 55 and 65 years old (Brouhier et al., 2021).

These definitional discrepancies reflected deeper theoretical divergences in how LCT were categorised. Of the 12 studies reviewed, only a minority explicitly grounded their definitions in established theoretical models. A primary conceptual framework invoked was Huberman’s (1989) model of career development, which distinguishes between phases such as “serenity” (typically between 19 and 30 years of experience) and “disengagement” (31–40 years), associated respectively with professional confidence and reflective distancing. This model was used by Gore and Rickards (2021) and Brouhier et al. (2023) to define the late-career phase as based on career stages rather than strictly chronological age.

Other studies, such as Robinson (2020), drew on the five-phase structure proposed by Baker (2005), which includes stages of reassessment (43–53) and proximate retirement (54+), while Meister (2010) referenced Lieberman and Mace (2009, as cited in Meister, 2010) to conceptualise professional development. However, the majority of studies, including Morcom and MacCallum

(2022), Leite et al. (2022), Monteiro et al. (2020), Snow-Gerono (2009) and Iancu-Haddad and Oplatka (2009), did not explicitly ground their definitions in theory. These studies defined LCT either pragmatically (e.g., based on years of experience or age thresholds) or relied on recommendations from school leaders or practical inclusion criteria without conceptual anchoring.

In contrast, Hargreaves and Elhawary (2019) and Hollweck (2019) acknowledged that their categorisations were not theoretically grounded. This inconsistency highlights the need for greater conceptual clarity in future research. Some authors have argued for hybrid definitions that combine age and experience (e.g., Brouhier et al., 2023), to more accurately reflect the diversity of professional trajectories and avoid equating chronological age with pedagogical expertise. Others caution against reifying generational labels, noting that professional identity and career stage are shaped by contextual, policy-related and personal factors beyond age alone (Tempest, 2003).

5.3. *Exploring the professional learning of LCT*

Following the exploration of the key dimensions of late-career teaching as outlined in the literature, this section addresses the second research question by examining the types of professional learning activities undertaken by LCT. The studies reviewed reveal a rich variety of professional learning practices among LCT, with a notable emphasis on informal, practice-embedded forms of development. Drawing on the frameworks of Evers et al. (2016) and Kyndt et al. (2016), these activities can be organised into formal and informal types of learning, as detailed in Table 3. Informal, workplace-embedded activities emerged as particularly prominent across the corpus. Many LCT engaged in peer dialogue and critical reflection with colleagues (Meister, 2010; Monteiro et al., 2020) or actively contributed to their professional communities through joint lesson planning or peer tutoring (Leite et al., 2022; Morcom & MacCallum, 2022). Mentoring relationships also served as key learning contexts, where LCT developed alongside their mentees, enhancing mutual reflection and pedagogical renewal (Hollweck, 2019; Iancu-Haddad & Oplatka, 2009). In Snow-Gerono's (2009) study, for instance, triadic mentoring within Professional Development Schools created cross-generational partnerships that deepened school-level capacity, supporting schools committed to the acquisition and sharing of knowledge among all members of the educational community and relying on research–practitioner collaboration. These socially embedded forms of learning, situated in trust-based collegial relations, were often viewed by participants as more authentic and motivating than top-down programmes. Notably, feedback-seeking and experimentation with new strategies (e.g., Gore & Rickards, 2021) often occurred informally, reinforcing the embedded and adaptive nature of LCT professional learning.

Formal learning activities, though less frequently cited, also played a role. These included participation in structured training, such as subject-specific workshops or conferences (Hargreaves & Elhawary, 2019; Monteiro et al., 2020), and involvement in system-wide initiatives such as professional development school programmes (Snow-Gerono, 2009). For example, some LCT attended formal courses focused on classroom management, digital integration or instructional design (Gore & Rickards, 2021), while others participated in externally facilitated peer coaching models (Leite et al., 2022). However, the value of these formal opportunities was often linked to their alignment with teachers' real-life classroom contexts and their integration with collaborative practice. In several studies, teachers emphasised the importance of opportunities to reflect with colleagues after formal training (e.g., Monteiro et al., 2020), underscoring the role of informal processes in consolidating formal learning. Mentoring, too, straddled the boundary between formal and informal learning: while it might be part of institutional programmes, it remained rooted in personal relationships and contextual negotiation (Iancu-Haddad & Oplatka, 2009).

Table 3
Types and frequencies[a] of professional learning activities mentioned in the selected articles, adapted from Kyndt et al. (2016) and Evers et al. (2016).

	Category	f	Activity
Formal	Professional development programmes	4	Participating in a school learning activity, taking part in (online) professional training or course organised by experts (role plays, examining video footage of teaching); Attending seminars and workshops related to all aspects of teaching (classroom management, disciplinary contents, assimilation in ICT, etc); Participating in a PDS programme
	Receiving structural coaching	1	Receiving coaching, participating in peer coaching with colleagues
	Attending a professional conference	1	Attending an educational conference and engaging in conference presentations or sessions
	Participating in formal teacher collaboration	1	Forming school-based working groups (e.g., subject-specific teams), actively participating in collaborative discussions and cross-school meetings
Informal	Core instructional practices with students	1	Joint-class sessions, co-teaching, "team-teaching", "learning by doing"
	Interaction, discussion, collaboration and sharing with others	12	Collaborating, receiving feedback (from colleagues and students as PD collaborators), reflective dialogue with colleagues on educational issues, curriculum, student development and instruction
	Engaging in tasks, roles and extracurricular activities	3	Taking a leadership role, coordinating and organising, coaching/mentoring colleagues and student teachers
	Consulting (offline/online) information sources	1	Undertaking self-directed learning via reading, research and (online) investigation
	Experimenting and innovating	3	Experimenting new methods and materials in classrooms
	Reflection and evaluation	3	Reflecting on pedagogical issues, inviting colleagues to attend a lesson, filming a lesson to get evaluated

[a] Each article mentioning a specific type of learning counts as one in Table 3.

5.4. Structuring the analysis with the JD-R model

To address the third research question, an analytical model was developed based on the JD–R model, allowing for a narrative synthesis across the selected literature. This model provides a structured lens through which to interpret the findings of a predominantly qualitative and descriptive body of research, supplemented by a smaller number of quantitative investigations focused on TPL among LCT. In most of the selected studies, TPL was explored in terms of its effects on engagement, sense of identity and professional competence for LCT, thereby situating learning as a product of broader contextual dynamics. In terms of job demands, several studies reported time constraints and role overload as critical challenges. Monteiro et al. (2020) and Iancu-Haddad and Oplatka (2009), for example, discussed how increasing responsibilities, especially in mentoring, can lead to emotional strain, limiting opportunities for self-directed development. Meister (2010) and Leite et al. (2022) also noted that institutional constraints, such as inflexible schedules or administrative burdens, often hinder participation in peer learning communities or reflective dialogue, thereby diminishing the perceived value and feasibility of continual professional learning in later career stages.

Job resources were available at both the school and class levels. Organisational structures such as Professional Development Schools (Snow-Gerono, 2009) offered LCT formal platforms for peer collaboration, mentorship and pedagogical innovation. At the interpersonal level, collegial relationships were essential in maintaining professional vitality. Studies by Hollweck (2019), Morcom and MacCallum (2022) and Hargreaves and Elhawary (2019) highlighted the role of mentoring and mutual support in building trust, promoting emotional safety and encouraging shared growth. In such environments, LCT were more likely to experiment with new practices, reflect critically on their experiences and contribute to collective learning. Personal resources also emerged as key determinants of engagement. Brouhier et al. (2023) identified the impact of self-efficacy, resilience and goal orientation on participation in TPL, while Gore and Rickards (2021) showed that a sense of purpose was often rekindled for LCT through their mentoring roles, which provided opportunities to reaffirm their expertise and support institutional continuity.

While the JD-R model highlights how job demands, job resources, and personal resources shape engagement, the reviewed studies reveal that professional learning itself often operates within this dynamic as both an outcome and a resource. Although this dual role is discussed in the broader TPL literature, the present review provides empirical confirmation. Mentoring (Iancu-Haddad & Oplatka, 2009), Quality Teaching Rounds (Gore & Rickards, 2021), and collegial inquiry repeatedly functioned both as outcomes of supportive organisational conditions and as resources that renewed purpose, motivation, and professional engagement among late-career teachers. This finding suggests that learning is not merely the product of favourable work environments but also a sustaining mechanism that reinforces well-being and identity in the later stages of teaching careers.

While the preceding analysis focused on how workplace conditions, namely, job demands and resources, and personal resources shaped participation by LCT in professional learning, a closer reading of the selected studies revealed a more nuanced theoretical insight. Beyond its function as an outcome influenced by these factors, TPL was also portrayed in several contributions as a valuable resource in itself, one that reinforces motivation, identity and long-term engagement. Although TPL was predominantly conceptualised as an *outcome* in the reviewed literature, that is, as something shaped by personal, relational and organisational factors, several studies also emphasised its role as a *resource* that actively contributes to sustaining motivation, engagement and professional identity in the later stages of a teaching career. For instance, in the study by Iancu-Haddad and Oplatka (2009), mentoring was not merely a task imposed on senior teachers, but a meaningful opportunity for reflection, identity affirmation and emotional renewal. Teachers involved in mentorship roles reported feeling valued and revitalised by the experience, particularly when it was framed as a legacy-building practice. Similarly, Gore and Rickards (2021) found that the Quality Teaching Rounds programme fostered renewed pedagogical enthusiasm and a sense of professional agency among teachers with over 19 years of experience. Through structured peer observation and collaborative dialogue, LCT described experiencing a "reawakening" of their instructional purpose, suggesting that the act of learning itself functioned as a psychological and motivational resource.

This dual conceptualisation, viewing TPL as both resource and outcome, was also present in studies such as Hollweck (2019) and Morcom and MacCallum (2022), where peer coaching and mentoring relationships were shown to foster mutual growth. In these contexts, professional learning emerged not as a top-down obligation, but as a socially embedded process through which teachers cultivated trust, resilience and adaptive capacities. Even informal learning, as observed in Meister (2010), took on a restorative role: Seasoned educators reflected on the depth of their accumulated expertise and found meaning in collegial conversations and ongoing commitment to student development. Conversely, when opportunities for development were limited or poorly structured, as in the study by Monteiro et al. (2020), where digital transitions created stress rather than growth, TPL risked becoming an additional demand rather than a sustaining resource. Recognising this bidirectional relationship between professional learning and engagement is essential for educational policy and practice. It implies that designing meaningful, accessible learning opportunities is not merely a professional obligation, but a strategic lever for promoting retention, well-being and instructional quality in the later phases of teaching careers.

At a broader theoretical level, rather than suggesting that the JD-R model fails to account for relational or systemic factors, the reviewed studies indicate that such multilevel dynamics, leadership practices, institutional policies, and intergenerational collaboration, operate as contextual inputs rather than as explicit mechanisms within the model. To make these mechanisms analytically visible, the present analysis draws on complementary perspectives from the teacher professional learning and social capital literature (e.g., Demir, 2021), thereby extending the JD-R lens toward a more systemic understanding of learning in late-career teaching contexts.

Overall, the synthesis of findings was structured using the JD-R model as an analytical lens, mapping job demands, resources, and professional learning outcomes across the 12 studies (see Tables 2 and 3 for detailed summaries). This organisation provides a comprehensive overview of how contextual and personal factors interact to shape late-career teachers' professional learning

trajectories.

6. Discussion

This systematic review synthesised research on the professional learning of LCT, focusing on how learning is experienced, supported, and sustained in the later stages of teaching careers. Drawing on the JD-R model, the analysis highlighted a conceptual evolution in the literature: professional learning is not merely an outcome shaped by workplace and personal factors but also a resource that reinforces motivation, identity, and engagement. These findings underline the bidirectional relationship between learning and well-being and point to the need for dynamic, context-sensitive approaches to sustaining professional growth at the end of the teaching career.

6.1. LCT and professional learning

The review confirms that professional learning remains a vital component of late-career engagement, even though it is often underexplored or mischaracterised in the literature. TPL is generally understood as a set of activities that enhance teacher professionality and professionalism throughout the career span (Brücknerová & Novotný, 2017; Evers et al., 2016). Across the selected studies, professional learning was depicted not as a static requirement, but rather as an ongoing process embedded in teachers' everyday work and evolving professional identity. This perspective challenges the deficit-based narratives that often associate the later stages of teaching with stagnation or disengagement. Instead, professional learning is positioned as a key lever to sustain motivation, purpose and meaningful contribution within the school community, an interpretation that also echoes conclusions drawn from another systematic review on teacher communities (Vangrieken et al., 2017).

Interactional and collaborative learning activities emerged as particularly significant for LCT. These included participation in professional learning communities, mentoring activities, intergenerational exchanges and involvement in school- or university-based networks. Regardless of the specific modality or context, the reviewed literature repeatedly emphasised the role of socially situated learning as a driver of engagement. Several studies highlighted that professional learning opportunities grounded in interaction, dialogue and peer support were more likely to resonate with the needs and preferences of LCT (Brouhier et al., 2023; Suryani & Widiyastuti, 2015). These findings align with those of Hagedoorn et al. (2025), who found that experienced vocational education teachers remained active learners, particularly through informal learning embedded in their daily teaching practice. Their results offer a counterpoint challenging the assumptions found in earlier research (e.g., Kyndt et al., 2016) that suggest a decline in learning engagement with professional seniority. On the contrary, LCT appeared to continue investing in both formal and informal learning opportunities when these are perceived as relevant and professionally meaningful (Sancar et al., 2021).

The present review aligns with this view. The selected studies consistently reported that LCT remained professionally active, not only by engaging in diverse development activities, but also by contributing to professional dialogue and shared practice within their institutions. Their commitment to learning often found expression in collaborative initiatives, mentoring roles and reflective inquiry. Far from being disengaged, these teachers frequently expressed a desire to adapt to evolving demands, refine their instructional strategies and support colleagues and learners alike. Importantly, this continued involvement was closely linked with the relational and contextual nature of the learning environment. Professional learning that is embedded in trust-based collaboration and aligned with teachers' experience and aspirations appears particularly effective in fostering both individual growth and collective capacity. These findings resonate strongly with the broader TPL literature, which emphasizes the inherently social and collaborative nature of teacher learning (Avalos, 2011; Vangrieken et al., 2017). The reviewed studies reinforce the view that access to expertise and shared professional inquiry are key mechanisms through which teachers construct meaning and sustain engagement over time (Darling-Hammond et al., 2017; Demir, 2021). Similar to earlier work highlighting the importance of situated and participatory learning (Kyndt et al., 2016; Opfer & Pedder, 2011), the present review suggests that for LCT, collegial dialogue and mentoring are not merely forms of knowledge transmission but relational spaces for identity renewal and reciprocal learning. This alignment with the broader TPL literature underscores that fostering professional growth among LCT requires conditions that enable interaction, reflection, and mutual trust, principles equally central to effective professional learning across career stages.

6.2. The JD-R model as an analytical lens for late-career professional learning

In this review the JD-R model served as an analytical lens to map workplace factors influencing late-career TPL. Rather than offering a review of JD–R applications in educational research, this study used the model to identify conceptual and empirical shortcomings in the literature, particularly in relation to these professionals. Notably, personal resources such as adaptability, resilience or self-efficacy, frequently studied in general teacher populations (Mu et al., 2024; Parsons et al., 2016), are under-investigated in studies focusing specifically on LCT (Collie et al., 2018; Dicke et al., 2018). Future research should explore how these internal assets and core strengths are maintained, developed or diminished over time, and how they interact with job demands and resources in this specific profession.

Moreover, the JD–R model's binary categorisation of workplace factors has been subject to critique. As Granziera et al. (2021) noted, job demands are not inherently detrimental, nor are all resources universally empowering. For instance, student misbehaviour may, in some cases, stimulate pedagogical creativity, while ambiguous role expectations may erode teacher engagement. A more differentiated understanding of demands and resources is therefore essential, one that considers their intensity, contextual meaning and subjective interpretation.

Qualitative inquiry holds particular promise to advance this nuanced perspective. Future studies should explore how LCT perceive, and experience specific job demands and resources in situ. Such investigations would help uncover the subjective meaning attributed to certain job characteristics, for example, that the same factor may be interpreted as energising by one teacher and draining by another, offering crucial insights into the relational and situational nature of professional learning needs. These nuanced understandings would offer valuable insights for adapting professional learning strategies to the diverse experiences of LCT.

Furthermore, despite increasing attention to TPL across career stages, there remains a notable lack of interventions explicitly tailored to the needs of LCT. Insights from qualitative research could play a pivotal role in informing the design of more context-sensitive and responsive professional learning strategies for this under-addressed population. By better understanding how LCT interpret and navigate their work environments, school leaders and policymakers can develop support mechanisms that reflect actual rather than assumed needs. Although intervention strategies informed by the JD-R model have shown promising outcomes (Alonso et al., 2019), their application to late-career TPL requires caution. Programs perceived as top-down or imposed may exacerbate stress (van Wingerden et al., 2013). In contrast, job-crafting interventions, activities that support teachers in shaping their work environments proactively to better align with their professional values, goals, strengths and needs, offer a more empowering alternative. These approaches not only enhance engagement and well-being but also contribute to a school culture that recognizes the shared responsibility for professional learning among individuals, institutions and policy systems. For further reviews of intervention-based approaches within the JD-R model, see also Knight et al. (2019) and van Wingerden et al. (2017).

6.3. *Toward a refined conceptual and operational definition of late-career teachers*

Based on the evidence reviewed, this study proposes a more precise and multidimensional definition of late-career teachers that integrates both structural and agentic dimensions of professional life. Conceptually, late-career teachers can be understood as educators who have accumulated substantial professional experience, typically exceeding two decades, and who are approaching the final phase of their teaching career, characterised by a combination of high professional competence, evolving identity, and shifting engagement with institutional and personal goals. This definition recognizes that late career is not merely a chronological stage, but a socially and psychologically situated period in which teachers negotiate continuity, adaptation, and legacy (Day & Gu, 2007; Kelchtermans, 2009; Mansfield, 2019). It also aligns with career construction and adaptability theories suggesting that professionals actively reshape their work meaning and engagement over time (Savickas, 2013; Spurk et al., 2019).

Operationally, late-career teachers are defined as those aged approximately 50 years or older and/or with at least 20 years of teaching experience, while also considering indicators of career orientation such as intentions to remain in or withdraw from the profession, perceived opportunities for learning, and professional contribution. This multidimensional operationalisation captures both observable and attitudinal dimensions of career stage and aligns with prior frameworks on teacher motivation and agency (Korthagen, 2017). Such an approach enables future research to move beyond purely age-based or experience-based criteria and to account for the dynamic interplay between professional trajectory, identity development, and contextual affordances that shape learning in late-career teaching (Day, 2017; Mansfield, 2019).

6.4. *Limitations and future research*

A notable feature of this review is the small number of studies that ultimately met all inclusion and quality criteria. Importantly, this limited corpus does not reflect shortcomings in the search strategy but rather the narrow empirical attention that the professional learning of late-career teachers (LCT) has received in the international literature over the past two decades. Although the initial search yielded several thousand records, very few empirical studies explicitly examined LCT as a distinct professional group, and even fewer focused specifically on their professional learning processes. Consequently, many potentially relevant articles were excluded because they addressed teachers in general, used mixed-age samples without subgroup analyses, or investigated outcomes unrelated to professional learning. This pattern indicates that, despite the increasing policy relevance of sustaining late-career engagement, research on LCT learning remains peripheral within the broader educational research landscape. The small corpus therefore reflects a substantive gap in the field rather than a narrow search strategy, underscoring the need for more sustained and conceptually grounded empirical work on how learning and development unfold in the later stages of teaching careers.

Against this backdrop, the present review provides valuable insights into the professional learning of LCT but also faces certain limitations that must be acknowledged. A first limitation concerns the scope and interpretation of the meta-summary model developed in this study. The model was primarily based on self-reported experiences and perceptions of LCT, which may not be unique to this cohort. The identified job demands and resources could also be relevant for teachers at other career stages, including novices and mid-career professionals. This underscores the need for comparative empirical research across different age and career groups to assess whether these patterns are specific to LCT or more broadly generalizable. For instance, van Der Heijden's (2006) study on career development activities used comparable age groupings across the whole career span, offering a useful model for such comparisons. Future studies could adopt a similar approach to empirically test the applicability of the JD–R model across generational cohorts.

Second, the selection criteria for included studies introduced potential bias. This review only included peer-reviewed journal articles available in four academic databases accessible through our institutional library. While these databases offered strong coverage of educational and psychological research, the exclusion of broader multidisciplinary sources such as Web of Science or EBSCO may have limited the comprehensiveness of the search. Nevertheless, this constraint was partly offset by the use of backward snowballing, which allowed the inclusion of additional relevant studies. Future reviews could expand database coverage to ensure a more exhaustive representation of the field. As such, it excluded grey literature, dissertations, book chapters and non-English publications.

The exclusion of studies in other languages or formats might have limited the diversity of perspectives represented. Similarly, the review focused solely on compulsory education (preschool, primary and secondary), and the conclusions are therefore not generalizable to post-compulsory or higher education contexts. Moreover, while the limited number of studies reviewed reflects a lack of research on late-career teacher development, it also narrows the evidence based on which conclusions can be drawn. This restriction is further explained by the fact that only studies specifically targeting LCT as a distinct group were included. As a result, a substantial number of comparative studies examining generational differences among teachers (Geeraerts et al., 2018; Karlberg & Bezzina, 2022; Portela Pruaño et al., 2022; Walsh, 2022) were excluded, despite offering potentially relevant insights. The use of broader inclusion criteria in future reviews may yield additional insights into how professional learning is experienced across contexts.

Another methodological limitation concerns the exclusion of comparative studies in which LCT were examined alongside other teacher groups (e.g., novices, mid-career teachers). This decision was made to preserve conceptual and analytical coherence, as the present review aimed to synthesise findings specifically addressing late-career teachers as a distinct professional group rather than as a comparative category. Including broader generational studies would have expanded the dataset substantially but also introduced heterogeneity in design, measures, and theoretical framing that could have diluted the focus on LCT-specific mechanisms. Nonetheless, as noted in the discussion, future research comparing late-career and mid-career teachers could yield valuable insights into developmental trajectories and differences in how job demands and resources interact across the career span.

The geographic distribution of studies also presented a limitation. Most of the articles analysed reported on studies conducted in Western countries, predominantly in Europe and North America. This leaves a significant gap in understanding how cultural, institutional or policy differences may influence TPL in non-Western settings, where the role and status of LCT may differ considerably (Rosenberg et al., 2024).

Moreover, a further limitation concerns the methodological scope of the existing literature. The predominance of qualitative research designs, used in nine out of the 12 studies, reflects a dominant interpretative orientation in this field, which favours in-depth, context-sensitive accounts of teachers' experiences. While this approach provides valuable insights into the subjective and relational dimensions of professional learning, it also limits the comparability and generalisability of the results. The variables and mechanisms identified in the analysis remain largely hypothetical and would benefit from further empirical validation. In particular, future research should use comparative, longitudinal or mixed models to test the sustainability, scalability and effectiveness of specific learning interventions over time and in different contexts. In addition, there was also a clear imbalance in the distribution of studies between different levels of education. Most research focused on primary and secondary education, while early childhood education remained significantly under-represented. This is a significant gap, especially given the emotional, physical and pedagogical demands of early childhood education work environments (Kwon et al., 2022; Randall et al., 2023). As the early childhood education workforce is aging in parallel with other sectors, there is an urgent need for studies examining the professional learning conditions, job demands and support structures specific to this setting. Such research could yield critical insights into how to better support LCT working in one of the most demanding and least visible sectors of education.

Another consideration concerns the use of the QARI quality assessment tool. While it served as a valuable guide in evaluating methodological rigor, four items in the checklist, namely, ethical approval, researcher influence, philosophical congruity and the cultural/theoretical positioning of the researcher, proved problematic. These criteria were rarely addressed or were difficult to apply consistently across studies. As a result, they were excluded from the final assessment. Instead, the quality appraisal focused on six core items related to methodological clarity and coherence. Articles were retained if they met at least five of these six criteria. Although this strategy enhanced inter-reviewer agreement and minimized misinterpretation, it may have led to the omission of certain studies that could have contributed valuable conceptual insights despite their reporting limitations. Finally, assessing credibility, dependability and transferability in qualitative systematic reviews remains a complex challenge. As Hannes (2011) and Dixon-Woods et al. (2007) suggested, review teams should adopt a balanced approach that combines technical appraisal with conceptual judgement. Future reviews may benefit from adopting structured frameworks such as Cochrane's three-step model (filtering, technical appraisal and theoretical appraisal) and from selecting quality appraisal tools aligned with their epistemological orientation and research objectives (Long et al., 2020).

6.5. *Implications*

Mentoring is the most frequently reported form of professional engagement for LCT. Often regarded as repositories of expertise, LCT are typically assigned roles supporting novice teachers' induction into the profession (Hobson & Malderez, 2013; Mosley et al., 2023; Richter et al., 2013). Yet this role is ambivalently portrayed in the literature. While mentoring can foster motivation, dialogue, and satisfaction, it may also generate stress or a sense of burden when expectations are unclear or support is lacking (Bressman et al., 2018; Day & Gu, 2010). Mentoring alone is therefore insufficient as a pathway for late-career professional growth. Recent research advocates for a reciprocal and developmental approach (Achinstein & Fogo, 2015; Ghosh & Reio, 2013; Karlberg & Bezzina, 2022), in which mentors also learn and benefit from institutional support, recognition, and time allocation (Hargreaves & Fullan, 2020). Structured formats such as peer coaching and reverse mentoring (Zauchner-Studnicka, 2017) can foster intergenerational exchange and renewed engagement for LCT. Several studies indicate that many LCT lacked formal mentoring early in their careers, limiting opportunities for reflective growth and collegial learning (Hargreaves & Elhawary, 2019; Iancu-Haddad & Oplatka, 2009). Addressing this historical gap requires viewing teaching as a career-long learning process supported by systemic recognition and enabling conditions (Guglielmi et al., 2016). Within this perspective, mentoring becomes one component of a broader, LCT-sensitive ecosystem that values mutual learning, shared leadership, and professional renewal.

A second implication concerns the organisational conditions that enable late-career teachers to sustain engagement in professional

learning. Evidence from the reviewed studies indicates that leadership support, particularly through time allocation, recognition of expertise, and facilitation of trust-based collaboration, plays a decisive role in maintaining motivation among LCT (Hollweck, 2019; Morcom & MacCallum, 2022; Robinson, 2020). School leaders therefore have a central responsibility to create enabling environments where LCT can contribute to collective learning without experiencing role overload. Hunzicker's (2011) framework remains a useful reference but requires adaptation to this career stage, emphasizing supportive, collaborative, and responsive forms of professional learning that address late-career realities such as mentoring balance, phased retirement, and evolving professional identity. Such context-sensitive approaches move beyond generic recommendations to acknowledge the unique conditions shaping LCT' growth and engagement.

Credit statement

Quentin Brouhier: Original idea, method, data collection, formal analysis, writing-original draft, writing-review and editing.
Virginie März: Writing-original draft, writing-review and editing, validation.
Isabel Raemdonck: Writing-original draft, writing-review and editing, validation, funding

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.edurev.2025.100757.

Data availability

Data will be made available on request.

References

References marked with an asterisk indicate studies included in the systematic review.
Achinstein, B., & Fogo, B. (2015). Mentoring novices' teaching of historical reasoning: Opportunities for pedagogical content knowledge development through mentor-facilitated practice. *Teaching and Teacher Education, 45*, 45–58.
Admiraal, W., Veldman, I., Mainhard, T., & van Tartwijk, J. (2019). A typology of veteran teachers' job satisfaction: Their relationships with their students and the nature of their work. *Social Psychology of Education, 22*(2), 337–355. https://doi.org/10.1007/s11218-018-09477-z
Alonso, C., Fernández-Salinero, S., & Topa, G. (2019). The impact of both individual and collaborative job crafting on Spanish teachers' well-being. *Education Sciences, 9*(2), 74–83. https://doi.org/10.3390/educsci9020074
Ariza-Montes, A., Leal-Rodríguez, A. L., & Leal-Millán, A. G. (2016). Workplace bullying among teachers: An analysis from the job demands-resources (JD-R) model perspective. *Journal of Occupational and Environmental Medicine, 58*(8), 818–827. https://doi.org/10.1097/JOM.0000000000000804
Avalos, B. (2011). Teacher professional development in *teaching and teacher education* over ten years. *Teaching and Teacher Education, 27*(1), 10–20. https://doi.org/10.1016/j.tate.2010.08.007
Babic, S., Mairitsch, A., Mercer, S., Sulis, G., Jin, J., King, J., … Shin, S. (2022). Late-career language teachers in Austria and the UK: Pathways to retirement. *Teaching and Teacher Education, 113*, 103686.
Baker, D. (2005). Music service teachers' life histories in the United Kingdom with implications for practice. *International Journal of Music Education, 23*(3), 263–277. https://doi.org/10.1177/0255761405058243
Baker, J., Chaseling, M., Boyd, W., & Shipway, B. (2018). Teachers' response to a new mandatory professional development process: Does it make a difference? *Professional Development in Education, 44*(4), 570–582. https://doi.org/10.1080/19415257.2017.1378706
Bakker, A. B., & 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
Bakker, A. B., Demerouti, E., & Sanz-Vergel, A. (2023). Job demands–resources theory: Ten years later. *Annual Review of Organizational Psychology and Organizational Behavior, 10*(1), 25–53. https://doi.org/10.1146/annurev-orgpsych-120920-053933
Ben-Peretz, M., Gottlieb, E., & Gideon, I. (2018). Coaching between experts – Opportunities for teachers' professional development. *Teacher Development, 22*(3), 303–313. https://doi.org/10.1080/13664530.2018.1438310
Boeskens, L., Nusche, D., & Yurita, M. (2020). Policies to support teachers' continuing professional learning: A conceptual framework and mapping of OECD data. In *OECD education working papers* (Vol. 235). https://doi.org/10.1787/247b7c4d-en
Booth, J., Coldwell, M., Müller, L. M., Perry, E., & Zuccollo, J. (2021). Mid-career teachers: A mixed methods scoping study of professional development, career progression and retention. *Education Sciences, 11*(6), 299.
Bressman, S., Winter, J. S., & Efron, S. E. (2018). Next generation mentoring: Supporting teachers beyond induction. *Teaching and Teacher Education, 73*, 162–170. https://doi.org/10.1016/j.tate.2018.04.003
* Brouhier, Q., Coppe, T., März, V., & Raemdonck, I. (2023). Professional learning of late-career teachers in early childhood education: A matter of (im) balance between personal resources, job resources, and job demands. *Teaching and Teacher Education, 133*, Article 104273. https://doi.org/10.1016/j.tate.2023.104273.
* Brouhier, Q., März, V., Van Waes, S., & Raemdonck, I. (2021). From isolation to interaction: A social network perspective on older teachers' position in school organizations and age-related HR practices. *Work, Aging and Retirement, 7*(4), 322–338. https://doi.org/10.1093/workar/waaa031.
Brücknerová, K., & Novotný, P. (2017). Intergenerational learning among teachers: Overt and covert forms of continuing professional development. *Professional Development in Education, 43*(3), 397–415. https://doi.org/10.1080/19415257.2016.1194876
Bryman, A. (2012). *Social research methods* (4th ed.). Oxford University Press.
Carstensen, L. L., & de Lang, F. R. (1996). *Future time perspective scale. Unpublished manuscript.* Stanford University.

Collie, R. J., Granziera, H., & Martin, A. J. (2018). Teachers' perceived autonomy support and adaptability: An investigation employing the job demands-resources model as relevant to workplace exhaustion, disengagement, and commitment. *Teaching and Teacher Education, 74*, 125–136. https://doi.org/10.1016/j.tate.2018.04.015P

Darling-Hammond, L., Hyler, M. E., & Gardner, M. (2017). Effective teacher professional development. *Learning Policy Institute*. https://ies.ed.gov/ncee/wwc/Study/86084.

Day, C. (2017). *Teachers' worlds and work: Understanding complexity, building quality*. Routledge. https://doi.org/10.4324/9781315170091

Day, C., & Gu, Q. (2007). Variations in the conditions for teachers' professional learning and development: Sustaining commitment and effectiveness over a career. *Oxford Review of Education, 33*(4), 423–443. https://doi.org/10.1080/03054980701450746

Day, C., & Gu, Q. (2010). *The new lives of teachers*. Routledge.

de Lange, A. H., Van Yperen, N. W., van der Heijden, B. I., & Bal, P. M. (2010). Dominant achievement goals of older workers and their relationship with motivation-related outcomes. *Journal of Vocational Behavior, 77*(1), 118–125. https://doi.org/10.1016/j.jvb.2010.02.013

Demerouti, E., Bakker, A. B., Nachreiner, F., & 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

Demir, E. K. (2021). The role of social capital for teacher professional learning and student achievement: A systematic literature review. *Educational Research Review, 33*, Article 100391.

Dicke, T., Stebner, F., Linninger, C., Kunter, M., & Leutner, D. (2018). A longitudinal study of teachers' occupational well-being: Applying the job demands-resources model. *Journal of Occupational Health Psychology, 23*(2), 262–277. https://doi.org/10.1037/ocp0000070

Dixon-Woods, M., Sutton, A., Shaw, R., Miller, T., Smith, J., Young, B., Bonas, S., Booth, A., & Jones, D. (2007). Appraising qualitative research for inclusion in systematic reviews: A quantitative and qualitative comparison of three methods. *Journal of Health Services Research & Policy, 12*(1), 42–47. https://doi.org/10.1258/135581907779497486

Draucker, C. B., Martsolf, D. S., Ross, R., Cook, C. B., Stidham, A. W., & Mweemba, P. (2009). The essence of healing from sexual violence: A qualitative metasynthesis. *Research in Nursing & Health, 32*(4), 366–378. https://doi.org/10.1002/nur.20333

Enthoven, S., Dupriez, V., & März, V. (2024). Where and how do teachers continue to learn their job? Postures and pathways within a "professional learning landscape". *Revue Française de Pédagogie, 223*(2), 129–148.

Eros, J. (2011). The career cycle and the second stage of teaching: Implications for policy and professional development. *Arts Education Policy Review, 112*(2), 65–70. https://doi.org/10.1080/10632913.2011.546683

European Commission. (2002). *European report on quality indicators of lifelong learning: Fifteen indicators*. Directorate-General for Education and Culture: Commission of the European Communities.

European Commission. (2020). *Digital education action plan 2021-2027*. European Commission. https://education.ec.europa.eu/focus-topics/digital-education/action-plan. Directorate-General for Education, Youth, Sport and Culture.

Evers, A. T., Kreijns, K., & Van der Heijden, B. I. (2016). The design and validation of an instrument to measure teachers' professional development at work. *Studies in Continuing Education, 38*(2), 162–178.

Evers, A. T., van der Heijden, B. I., Kreijns, K., & Vermeulen, M. (2016). Job demands, job resources, and flexible competence: The mediating role of teachers' professional development at work. *Journal of Career Development, 43*(3), 227–243. https://doi.org/10.1177/0894845315597473

Forde, C., & McMahon, M. (2019). Teacher professional learning: Building expertise over a teaching career. In *Teacher quality, professional learning and policy: Recognising, rewarding and developing teacher expertise* (pp. 139–166). London: Palgrave Macmillan UK. https://doi.org/10.1057/978-1-137-53654-9_6.

García-Arroyo, J., Cárdenas Moncayo, I., Gómez García, A. R., & Osca Segovia, A. (2021). Understanding the relationship between situational strength and burnout: A multi-sample analysis. *International Journal of Environmental Research and Public Health, 18*(1), 162. https://doi.org/10.3390/ijerph18010162

Geeraerts, K., Tynjälä, P., & Heikkinen, H. L. (2018). Inter-generational learning of teachers: What and how do teachers learn from older and younger colleagues? *European Journal of Teacher Education, 41*(4), 479–495. https://doi.org/10.1080/02619768.2018.1448781

Ghosh, R., & Reio, T. G., Jr. (2013). Career benefits associated with mentoring for mentors: A meta-analysis. *Journal of Vocational Behavior, 83*(1), 106–116.

* Gore, J., & Rickards, B. (2021). Rejuvenating experienced teachers through quality teaching rounds professional development. *Journal of Educational Change, 22*(3), 335–354. https://doi.org/10.1007/s10833-020-09386-z.

Granziera, H., Collie, R., & Martin, A. (2021). Understanding teacher wellbeing through job demands-resources theory. In C. F. Mansfield (Ed.), *Cultivating teacher resilience* (pp. 229–244). Springer. https://doi.org/10.1007/978-981-15-5963-1_14.

Greene, B. A. (2015). Measuring cognitive engagement with self-report scales: Reflections from over 20 years of research. *Educational Psychologist, 50*(1), 14–30. https://doi.org/10.1080/00461520.2014.989230

Guglielmi, D., Bruni, I., Simbula, S., Fraccaroli, F., & Depolo, M. (2016). What drives teacher engagement: A study of different age cohorts. *European Journal of Psychology of Education, 31*, 323–340. https://doi.org/10.1007/s10212-015-0263-8

Hagedoorn, M., Koopman, M., Bouwmans, M., & de Bruijn, E. (2025). One size does not fit all-mapping informal and formal professional development activities of vocational teachers. *Teachers and Teaching, 31*(3), 372–392. https://doi.org/10.1080/13540602.2023.2276743

Hannes, K. (2011). Critical appraisal of qualitative research. In J. Noyes, A. Booth, K. Hannes, A. Harden, J. Harris, S. Lewin, & C. Lockwood (Eds.), *Supplementary guidance for inclusion of qualitative research in cochrane systematic reviews of interventions*. Cochrane Collaboration Qualitative Methods Group (Version 1, updated August 2011) http://cqrmg.cochrane.org/supplemental-handbook-guidance.

Hargreaves, A., & Fullan, M. (2020). Professional capital after the pandemic: revisiting and revising classic understandings of teachers' work. *Journal of Professional Capital and Community, 5*(3/4), 327–336.

* Hargreaves, E., & Elhawary, D. (2019). Professional development through mutually respectful relationship: Senior teachers' learning against the backdrop of hierarchical relationships. *Professional Development in Education, 45*(1), 46–58. https://doi.org/10.1080/19415257.2018.1500390.

Heffernan, A., Bright, D., Kim, M., Longmuir, F., & Magyar, B. (2022). 'I cannot sustain the workload and the emotional toll': Reasons behind Australian teachers' intentions to leave the profession. *Australian Journal of Education, 66*(2), 196–209. https://doi.org/10.1177/00049441221086654

Heyvaert, M., Hannes, K., & Onghena, P. (2016). *Using mixed methods research synthesis for literature reviews*. Sage Publications.

Hobfoll, S. E. (2002). Social and psychological resources and adaptation. *Review of General Psychology, 6*(4), 307–324. https://doi.org/10.1037/1089-2680.6.4.307

Hobfoll, S. E., Johnson, R. J., Ennis, N., & Jackson, A. P. (2003). Resource loss, resource gain, and emotional outcomes among inner city women. *Journal of Personality and Social Psychology, 84*(3), 632–643. https://doi.org/10.1037/0022-3514.84.3.632

Hobson, A. J., & Malderez, A. (2013). Judgementoring and other threats to realizing the potential of school-based mentoring in teacher education. *International Journal of Mentoring and Coaching in Education, 2*(2), 89–108.

* Hollweck, T. (2019). "I love this stuff!": A Canadian case study of mentor–coach well-being. *International Journal of Mentoring and Coaching in Education, 8*(4), 325–344. https://doi.org/10.1108/IJMCE-02-2019-0036.

Huberman, M. (1989). Les phases de la carrière enseignante: un essai de description et de prévision [The phases of the teaching career: An attempt at describing and predicting]. *Revue Française de Pédagogie, 86*, 5–16.

Hunzicker, J. (2011). Effective professional development for teachers: A checklist. *Professional Development in Education, 37*(2), 177–179. https://doi.org/10.1080/19415257.2010.523955

* Iancu-Haddad, D., & Oplatka, I. (2009). Mentoring novice teachers: Motives, process, and outcomes from the mentor's point of view. *The New Educator, 5*(1), 45–65. https://doi.org/10.1080/1547688X.2009.10399563.

Jakovljevic, M., Westerman, R., Sharma, T., & Lamnisos, D. (2021). Aging and global health. In I. Kickbusch, D. Ganten, & M. Moeti (Eds.), *Handbook of global health* (pp. 73–102). Springer. https://doi.org/10.1007/978-3-030-45009-0_4.

Jansen in de Wal, J., van den Beemt, A., Martens, R. L., & den Brok, P. J. (2020). The relationship between job demands, job resources and teachers' professional learning: Is it explained by self-determination theory? *Studies in Continuing Education, 42*(1), 17–39. https://doi.org/10.1080/0158037X.2018.1520697

Jaquith, A., Mindich, D., Wei, R. C., & Darling-Hammond, L. (2011). Teacher professional learning in the U.S.: Case studies of state policies and strategies. *The Education Digest, 77*(2), 33–39. https://www.proquest.com/magazines/teacher-professional-learning-u-s-case-studies/docview/896478460/se-2.

Jensen, B., Sonnemann, J., Roberts-Hull, K., & Hunter, A. (2016). Beyond PD: Teacher professional learning in high-performing systems. Teacher quality systems in top performing countries. *National center on education and the economy*.

Jeon, H. J., Kwon, K. A., Walsh, B., Burnham, M. M., & Choi, Y. J. (2019). Relations of early childhood education teachers' depressive symptoms, job-related stress, and professional motivation to beliefs about children and teaching practices. *Early Education & Development, 30*(1), 131–144. https://doi.org/10.1080/10409289.2018.1539822

Karlberg, M., & Bezzina, C. (2022). The professional development needs of beginning and experienced teachers in four municipalities in Sweden. *Professional Development in Education, 48*(4), 624–641. https://doi.org/10.1080/19415257.2020.1712451

Kelchtermans, G. (2009). Who I am in how I teach is the message: Self-understanding, vulnerability and reflection. *Teachers and Teaching: Theory and Practice, 15*(2), 257–272. https://doi.org/10.1080/13540600902875332

Knight, C., Patterson, M., & Dawson, J. (2019). Work engagement interventions can be effective: A systematic review. *European Journal of Work & Organizational Psychology, 28*(3), 348–372. https://doi.org/10.1080/1359432X.2019.1588887

Koerber, N., Marquez-Mendez, M., Mensah, A., Fasching-Varner, K., & Schrader, P. G. (2023). Sustaining teacher needs: A systematic narrative review exploring teacher retention, attrition, and motivation. *Literature Reviews in Education and Human Services, 2*(2), 1–20.

Korthagen, F. (2017). Inconvenient truths about teacher learning: Towards professional development 3.0. *Teachers and Teaching, 23*(4), 387–405. https://doi.org/10.1080/13540602.2016.1211523

Kwakman, K. (2003). Factors affecting teachers' participation in professional learning activities. *Teaching and Teacher Education, 19*(2), 149–170. doi: 2010.1016/S0742-051X(02)00101-4.

Kwon, K. A., Ford, T. G., Salvatore, A. L., Randall, K., Jeon, L., Malek-Lasater, A., Ellis, N., Kile, M. S., Horm, D. M., Kim, S. G., & Han, M. (2022). Neglected elements of a high-quality early childhood workforce: Whole teacher well-being and working conditions. *Early Childhood Education Journal, 50*, 157–168. https://doi.org/10.1007/s10643-020-01124-7

Kyndt, E., Gijbels, D., Grosemans, I., & Donche, V. (2016). Teachers' everyday professional development: Mapping informal learning activities, antecedents, and learning outcomes. *Review of Educational Research, 86*(4), 1111–1150. https://doi.org/10.3102/0034654315627864

* Leite, L. O., Go, W., & Havu-Nuutinen, S. (2022). Exploring the learning process of experienced teachers focused on building positive interactions with pupils. *Scandinavian Journal of Educational Research, 66*(1), 28–42. https://doi.org/10.1080/00313831.2020.1833237.

LePine, J., Podsakoff, N. P., & Lepine, M. (2005). A meta-analytic test of the challenge stressor–hindrance stressor framework: An explanation for inconsistent relationships among stressors and performance. *Academy of Management Journal, 48*(5). https://journals.aom.org/doi/10.5465/amj.2005.18803921.

Lockwood, C., Munn, Z., & Porritt, K. (2015). Qualitative research synthesis: Methodological guidance for systematic reviewers utilizing meta-aggregation. *JBI Evidence Implementation, 13*(3), 179–187. https://doi.org/10.1097/XEB.0000000000000062

Long, H. A., French, D. P., & Brooks, J. M. (2020). Optimising the value of the critical appraisal skills programme (CASP) tool for quality appraisal in qualitative evidence synthesis. *Research Methods in Medicine & Health Sciences, 1*(1), 31–42. https://doi.org/10.1177/2632084320947559

Louws, M. L., Van Veen, K., Meirink, J. A., & Van Driel, J. H. (2017). Teachers' professional learning goals in relation to teaching experience. *European Journal of Teacher Education, 40*(4), 487–504. https://doi.org/10.1080/02619768.2017.1342241

Mansfield, J. (2019). *Pedagogical equilibrium: The development of teachers' professional knowledge*. Routledge.

Marcus, J. (2022). The essential role of intersectionality in the science of work and aging. *Work, Aging and Retirement, 8*(4), 358–360. https://doi.org/10.1093/workar/waab036

* Meister, D. G. (2010). Experienced secondary teachers' perceptions of engagement and effectiveness: A guide for professional development. *Qualitative Report, 15*(4), 880–898.

Mertler, C. A. (2016). Should I stay or should I go? Understanding teacher motivation, job satisfaction, and perceptions of retention among Arizona teachers. *International Research in Higher Education, 1*(2), 34–45. https://doi.org/10.5430/irhe.v1n2p34

Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & Prisma Group. (2009). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. *PLoS Medicine, 6*(7), Article e1000097. https://doi.org/10.1371/journal.pmed.1000097, 20.

* Monteiro, A., Mouraz, A., & Thomas Dotta, L. (2020). Veteran teachers and digital technologies: Myths, beliefs and professional development. *Teachers and Teaching, 26*(7–8), 577–587. https://doi.org/10.1080/13540602.2021.1900809.

* Morcom, V., & MacCallum, J. (2022). Mentoring experienced teachers to change their practice: A sociocultural perspective for professional learning and development. *Learning, Culture and Social Interaction, 34*, Article 100627. https://doi.org/10.1016/j.lcsi.2022.100627.

Mosley, K. C., Playfair, E. C., Weppner, C. H., Balat, A., & McCarthy, C. J. (2023). 'The bread and butter of a difficult profession: Mentoring as a resource for teacher stress. *Teachers and Teaching, 29*(1), 20–36. https://doi.org/10.1080/13540602.2022.2144819

Mu, G. M., Gordon, D., Liang, J., Zhao, L., Alonso, R. A., Juri, M. Z., Zhang, X., Vo, H., Gao, D., Hu, Y., & Xing, C. (2024). A meta-analysis of the correlation between teacher self-efficacy and teacher resilience: Concerted growth and contextual variance. *Educational Research Review*. , Article 100645. https://doi.org/10.1016/j.edurev.2024.100645

National Commission on Teaching and America's Future. (1996). *What matters most: Teaching for America's future*.

Noyes, J., Booth, A., Cargo, M., Flemming, K., Harden, A., … Harris, J. (2019). Qualitative evidence. *Cochrane handbook for systematic reviews of interventions*, 525–545.

Organization for Economic Co-operation and Development. (2019). *Education at a glance 2019: OECD indicators*. OECD Publishing.

Organization for Economic Co-operation and Development. (2025). *Trends shaping education 2025*. OECD Publishing. https://www.oecd.org/en/publications/trends-shaping-education-2025_ee6587fd-en.html.

Orland-Barak, L. (2014). Mind the gap: Teacher learning, teacher development, and teacher inquiry. *Teachers and Teaching, 20*(6), 667–671. https://doi.org/10.1080/13540602.2014.885701

Ozamiz-Etxebarria, N., Legorburu Fernnadez, I., Lipnicki, D. M., Idoiaga Mondragon, N., & Santabárbara, J. (2023). Prevalence of burnout among teachers during the COVID-19 pandemic: A meta-analysis. *International Journal of Environmental Research and Public Health, 20*(6), 4866. https://doi.org/10.3390/ijerph20064866

Park, C. U., & Kim, H. J. (2015). Measurement of inter-rater reliability in systematic review. *Hanyang Medical Reviews, 35*(1), 44–49. https://doi.org/10.7599/hmr.2015.35.1.44

Parsons, A. W., Ankrum, J. W., & Morewood, A. (2016). Professional development to promote teacher adaptability. *Theory Into Practice, 55*(3), 250–258. https://doi.org/10.1080/00405841.2016.1173995

Pearson, A., White, H., Bath-Hextall, F., Salmond, S., Apostolo, J., & Kirkpatrick, P. (2015). A mixed-methods approach to systematic reviews. *International Journal of Evidence-Based Healthcare, 13*(3), 121–131. https://doi.org/10.1097/XEB.0000000000000052, 20.

Pekrun, R., & Linnenbrink-Garcia, L. (2012). Academic emotions and student engagement. In S. L. Christenson, A. L. Reschly, & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 259–282). Springer. https://doi.org/10.1007/978-1-4614-2018-7_12.

Pickering, C., & Byrne, J. (2014). The benefits of publishing systematic quantitative literature reviews for PhD candidates and other early-career researchers. *Higher Education Research and Development, 33*(3), 534–548. https://doi.org/10.1080/07294360.2013.841651, 20.

Portela Pruaño, A., Bernárdez Gómez, A., Marrero Galvan, J. J., & Nieto Cano, J. M. (2022). Intergenerational professional development and learning of teachers: A mixed methods study. *International Journal of Qualitative Methods, 21*, Article 16094069221133233. https://doi.org/10.1177/16094069221133233

Postholm, M. B. (2012). Teachers' professional development: A theoretical review. *Educational Research, 54*(4), 405–429. https://doi.org/10.1080/00131881.2012.734725

Raemdonck, I., Beausaert, S., van der Heijden, B. I., & Segers, M. (2022). Sustainable employability of teaching staff members? A multiple-group path analysis of the role of age, self-directed learning orientation and job characteristics for employability. *Vocations and Learning, 15*(3), 497–530. https://doi.org/10.1007/s12186-022-09291-x

Randall, K., Kwon, K. A., Ford, T. G., & Malek-Lasater, A. (2023). Physical well-being in early childhood teachers: Correlates of work-related musculoskeletal issues and fitness among these "educational athletes". *Early Education & Development, 34*(2), 551–571. https://doi.org/10.1080/10409289.2022.2049111

Rethlefsen, M. L., Kirtley, S., Waffenschmidt, S., Ayala, A. P., Moher, D., Page, M. J., Koffel, J. B., & PRISMA-S Group. (2021). PRISMA-S: An extension to the PRISMA statement for reporting literature searches in systematic reviews. *Systematic Reviews, 10*, 29. https://doi.org/10.1186/s13643-020-01542-z

* Robinson, J. (2020). Australian super veteran secondary school music teachers: Motivated and valuable. *International Journal of Music Education, 38*(2), 226–239. https://doi.org/10.1177/0255761420902870.

Rosenberg, M. W., Cheng, Y., Prieto-Flores, M. E., & Braimah, J. A. (2024). Non-Western perspectives on aging and place. In M. Cutchin, & G. D. Rowles (Eds.), *Handbook on aging and place* (pp. 101–119). Edward Elgar Publishing. https://doi.org/10.4337/9781802209983.00016.

Sancar, R., Atal, D., & Deryakulu, D. (2021). A new framework for teachers' professional development. *Teaching and Teacher Education, 101*, Article 103305. https://doi.org/10.1016/j.tate.2021.103305

Sandelowski, M., Voils, C. I., Leeman, J., & Crandell, J. L. (2012). Mapping the mixed methods–mixed research synthesis terrain. *Journal of Mixed Methods Research, 6*(4), 317–331. https://doi.org/10.1177/1558689811427913, 20.

Savickas, M. L. (2013). Career construction theory and practice. *Career development and counseling: Putting theory and research to work, 2*(1), 144–180.

Schmidt, J. A., Rosenberg, J. M., & Beymer, P. N. (2018). A person-in-context approach to student engagement in science: Examining learning activities and choice. *Journal of Research in Science Teaching, 55*(1), 19–43. https://doi.org/10.1002/tea.21409

Smet, K., Grosemans, I., De Cuyper, N., & Kyndt, E. (2022). Outcomes of informal work-related learning behaviours: A systematic literature review. *Scandinavian Journal of Work and Organizational Psychology, 7*(1), 2. https://doi.org/10.16993/sjwop.151

Smith, S., & Lawrence, S. (2019). *Early care and education teacher well-being: Associations with children's experience, outcomes, and workplace conditions: A research-to-policy brief*. Research connections. http://www.nccp.org/wp-content/uploads/2020/05/text_1224.pdf.

* Snow-Gerono, J. L. (2009). Voices less silenced: What do veteran teachers value in school–university partnerships and initial teacher preparation?. *The Teacher Educator, 44*(4), 248–267. https://doi.org/10.1080/08878730903186348.

Spurk, D., Hirschi, A., & Dries, N. (2019). Antecedents and outcomes of objective versus subjective career success: Competing perspectives and future directions. *Journal of Management, 45*(1), 35–69. https://doi.org/10.1177/0149206318786563

Suryani, A., & Widyastuti, T. (2015). The role of teachers' experiential learning and reflection for enhancing their autonomous personal and professional development. *Jurnal Sosial Humaniora (JSH), 8*(1), 1–22. https://doi.org/10.12962/J24433527.V8I1.1239

Tempest, S. (2003). Intergenerational learning: A reciprocal knowledge development process that challenges the language of learning. *Management Learning, 34*(2), 181–200. https://doi.org/10.1177/1350507603034002002

Torenbeek, M., & Peters, V. (2017). Explaining attrition and decreased effectiveness of experienced teachers: A research synthesis. *Work, 57*(3), 397–407. https://doi.org/10.3233/WOR-172575

van Der Heijden, B. I. J. M. (2006). Age differences in career activities among higher-level employees in the Netherlands: A comparison between profit sector and non-profit sector staff. *International Journal of Training and Development, 10*(2), 98–120. https://doi.org/10.1111/j.1468-2419.2006.00247.x

van der Heijden, B. I. J. M., van Vuuren, T. C. V., Kooij, D. T. A. M., & de Lange, A. H. (2015). Tailoring professional development for teachers in primary education: The role of age and proactive personality. *Journal of Managerial Psychology, 30*(1), 22–37. https://doi.org/10.1108/JMP-07-2014-0211, 20.

van Wingerden, J., Bakker, A. B., & Derks, D. (2017). The longitudinal impact of a job crafting intervention. *European Journal of Work & Organizational Psychology, 26*(1), 107–119. https://doi.org/10.1080/1359432X.2016.1224233

van Wingerden, J., Derks-Theunissen, D. A. J. A., Bakker, A. B., & Dorenbosch, L. (2013). Job crafting in schools for special education: A qualitative analysis. *Gedrag en Organisatie: Tijdschrift Voor Sociale, Arbeids- En Organisatie-Psychologie, 26*(1), 85–103. http://hdl.handle.net/1765/91772.

Vangrieken, K., Meredith, C., Packer, T., & Kyndt, E. (2017). Teacher communities as a context for professional development: A systematic review. *Teaching and Teacher Education, 61*, 47–59. https://doi.org/10.1016/j.tate.2016.10.001

Walsh, T. (2022). 'Promoted widely but not valued': Teachers' perceptions of team teaching as a form of professional development in post-primary schools in Ireland. *Professional Development in Education, 48*(4), 688–704. https://doi.org/10.1080/19415257.2020.1725596

Xanthopoulou, D., Bakker, A. B., Demerouti, E., & Schaufeli, W. B. (2007). The role of personal resources in the job demands-resources model. *International Journal of Stress Management, 14*(2), 121–141. https://doi.org/10.1037/1072-5245.14.2.121

Zauchner-Studnicka, S. A. (2017). A model for reverse-mentoring in education. *International Journal of Educational and Pedagogical Sciences, 11*(3), 551–558.

Zhang, F., & Parker, S. K. (2019). Reorienting job crafting research: A hierarchical structure of job crafting concepts and integrative review. *Journal of Organizational Behavior, 40*(2), 126–146. https://doi.org/10.1002/job.2332

Zhang, S., Shi, Q., & Lin, E. (2020). Professional development needs, support, and barriers: TALIS US new and veteran teachers' perspectives. *Professional Development in Education, 46*(3), 440–453. https://doi.org/10.1080/19415257.2019.1614967