What Factors Contribute to Mathematics Teacher Wellbeing? A Scoping Review

Julia L. Hill[1]; Gosia Marschall[2]

[1] RMIT University, Australia; and The University of Melbourne
[2] Cambridge University, United Kingdom

Abstract: Teacher wellbeing has emerged as a critical concern in mathematics education, yet current understanding of wellbeing remains fragmented across various constructs without coherent theoretical integration. This scoping review examined how mathematics teachers (both primary and secondary) research has engaged with wellbeing dimensions and identified contributing factors. A scoping review following a PRISMA-Sc statement was undertaken across 21 years of research (2014-2024), systematically searching five databases and fifteen key teacher journals, yielding 37 studies meeting inclusion criteria. Results revealed 15 (41%) of studies explicitly mentioning wellbeing, with only five of these reporting its explicit definitions. The research centred on a deficit orientation, with 89% focusing on hedonic wellbeing (e.g. emotions) and 65% of these examining negative emotions exclusively. Emergent hedonic themes were: The importance of mathematical content knowledge and competence, mathematics teacher identity, student factors, and curriculum-pedagogical tensions. Eudemonic (i.e. positive functioning) received less attention than hedonic aspects of wellbeing. This review provides foundational mapping for developing a comprehensive, strength-based framework for mathematics teacher wellbeing, moving beyond deficit narratives toward understanding what enables teachers of mathematics to flourish and stay in the profession.

Keywords: mathematical wellbeing, positive psychology, teacher retention

Contact: julia.hill2@RMIT.edu.au

1 Introduction

Teacher wellbeing, defined as feeling good (i.e. hedonia) and functioning optimally (i.e. eudemonia) (Huppert & So, 2013), has emerged as a critical concern in education systems worldwide. This issue is particularly acute in mathematics education, where countries report up to half of mathematics teachers leaving the profession within five years of qualifying (Foster, 2019; Sibieta, 2020). Mathematics teachers' wellbeing is of particular interest because it is uniquely characterized by widespread public anxiety, pervasive student disengagement, cultural narratives of fixed ability, and pedagogical tensions that distinguish it from other academic disciplines (Dowker et al., 2016; Mujtaba & Reiss, 2013). The narrative of an

'epidemic of stress' among teachers (Asthana & Boycott-Owen, 2018) has positioned teacher wellbeing as central to addressing retention crises and educational effectiveness.

Current understanding of mathematics teacher wellbeing (MTWB) remains fragmented, with research scattered across various constructs such as anxiety, stress, job satisfaction, and self-efficacy, without coherent theoretical integration (Hascher & Waber, 2021). This fragmentation is compounded by what can be described as limited 'wellbeing literacy' in mathematics education research—the capacity to clearly articulate, measure, and apply wellbeing constructs in domain-specific contexts (Oades et al., 2022). Furthermore, since "[al]most everything known on emotions of mathematics teachers at different school levels is limited to mathematics anxiety" (Martinez-Sierra et al., 2022, p. 580), we suspect there is a predominant focus on negative emotional experiences and deficit narratives in mathematics education research, potentially reflecting broader cultural assumptions about mathematics as inherently anxiety-provoking or problematic.

Hascher and Waber's (2021) systematic review of general teacher wellbeing noted that a clear differentiation between wellbeing dimensions and wellbeing correlates was lacking. They also noted that many studies included in their review conflated predictors and outcomes of teacher wellbeing with the wellbeing construct itself, and lacked domain-specific foci on teacher wellbeing. This lack of subject-specific teacher wellbeing research could undermine future strategies to support the wellbeing of mathematics teachers since wellbeing interventions are most effective when they are targeted and context-specific rather than generic (Kern & Wehmeyer, 2021).

In our current review, the first of its kind exclusively focusing on MTWB, we address these aforementioned limitations and gaps in academic knowledge by: reviewing research that focuses solely on the wellbeing of mathematics teachers both at primary and secondary school levels, systematically examining how mathematics teacher research defines wellbeing (if at all) to provide clearer theoretical boundaries for future MTWB research, and then categorizing the contributing positive (i.e., fostering MTWB) and negative (i.e., undermining MTWB) hedonic and eudemonic factors and their antecedents.

Specifically, in this scoping review, we respond to the following research questions:

1. In what ways do studies focusing on primary and secondary mathematics teachers define wellbeing?
2. How do these studies engage with hedonic aspects of wellbeing, and their contributing factors?
3. How do these studies engage with eudemonic aspects of wellbeing, and their contributing factors?

2 Background and theoretical framing

2.1 Prominent theories of wellbeing

Wellbeing has traditionally been conceptualized through two overarching philosophical traditions that offer distinct perspectives on human flourishing. The hedonic tradition, tracing back to Aristippus and hedonistic philosophy, conceptualizes wellbeing as the pursuit of pleasure and avoidance of pain, with contemporary operationalizations focusing on subjective evaluations of happiness, life satisfaction, and positive affect (Diener, 1984; Heintzelman, 2018). In contrast, the eudemonic tradition, rooted in Aristotelian philosophy, conceptualizes wellbeing as living according to one's 'daimon' or true self, emphasizing meaning, personal growth, and self-realization (Huta & Waterman, 2014). Contemporary eudemonic approaches focus on psychological functioning, purpose in life, personal growth, environmental mastery, autonomy, positive relations with others, and self-acceptance (Huta & Waterman, 2014; Ryan & Deci, 2001).

While hedonism and eudemonia were historically viewed as competing paradigms, contemporary wellbeing research (e.g. Wehmeyer & Kern, 2021; Huppert & So, 2013) increasingly recognizes them as distinct yet complementary and interwoven. Indeed, modern conceptualizations often integrate both hedonic (affective wellbeing, positive emotions) and eudemonic elements (meaning in work, personal growth, professional competence, relationships) within multidimensional frameworks, acknowledging wellbeing's complex, multifaceted nature. Examples of these are: Seligman's (2011) PERMA framework (positive emotions, engagement, relationship, meaning, accomplishment); Kern et al.'s (2016) EPOCH model (engagement perseverance, optimism, connectedness, and happiness); or Huppert and So's (2013) ten elements of wellbeing: Competence, emotional stability, engagement, meaning, optimism, positive emotions, positive relationships, resilience, self-esteem, and vitality. Consequently, in this review, we define

wellbeing according to both hedonic (i.e. feeling good) and eudemonic (i.e. functioning well) aspects and use these two broad approaches to categorize the data extracted in this review.

2.2 Wellbeing literacy

Wellbeing literacy represents "a capability to comprehend and compose wellbeing language, across contexts, with the intention of using such language to maintain or improve the wellbeing of oneself, others or the world" (Oades et al. 2021, p. 1). The concept of wellbeing literacy comprises five key components: vocabulary and knowledge about wellbeing concepts, multimodal comprehension of wellbeing content, multimodal composition of wellbeing communications, context sensitivity in adapting language to specific situations, and intentionality in using wellbeing language purposefully (Oades et al., 2021). Central to this framework is the emphasis on context specificity—the recognition that wellbeing constructs must be understood and applied within specific domains to be meaningful and effective (Hascher & Waber, 2021).

The wellbeing literacy concept speaks to the arguably poor generalizability and sustainability of generic teaching wellbeing initiatives which tend to be "disconnected from the teachers' daily work with students…addressing general issues related to TWB [teacher wellbeing]" (Hascher & Waber, 2021, p. 15). For example, while both mathematics and English teachers may experience stress, the sources and manifestations of this stress can differ substantially. Mathematics teachers may struggle with mathematical anxiety and concerns about algorithmic versus conceptual teaching approaches, whereas English teachers might face challenges around subjective assessment practices and diverse literary interpretations. Similarly, professional identity and sense of belonging operate differently—mathematics teachers may feel excluded from communities of mathematical practice due to perceived competence deficits, while English teachers would likely experience different identity tensions like creative expression with direct instruction of phonics. In our study, we examine wellbeing in the context of mathematics teachers, to begin developing MTWB literacy.

2.3 Prior reviews on teacher wellbeing

Several systematic reviews have attempted to synthesize the teacher wellbeing literature, revealing diverse approaches to organizing this complex field. Hascher

and Waber (2021) categorized 98 studies into five theoretical foundations (wellbeing psychology, positive psychology, Job Demands-Resources model, general wellbeing models, and domain-specific occupational wellbeing), advocating for more research on subject-specific rather than generic teacher wellbeing, which we address in the current review. In their meta-analysis of 173 studies, Zhou et al. (2024) distinguished between hedonic wellbeing, eudemonic wellbeing, general wellbeing, and occupational wellbeing with explicit engagement with hedonic versus eudemonic distinctions. Dreer (2023) focused specifically on teacher wellbeing outcomes rather than conceptual frameworks, identifying subjective wellbeing as the most prevalent approach in 43% of studies but with limited engagement with hedonic-eudemonic distinctions. Beames et al. (2023) took a pragmatic intervention-focused approach, measuring wellbeing outcomes across stress, anxiety, depression, burnout, and general wellbeing domains without extensive theoretical development. To our knowledge no studies to date have reviewed MTWB.

3 Methods

3.1 Study design

This scoping review followed Arksey and O'Malley's (2005) five-stage framework and the Preferred Reporting Items for Systematic Reviews and Meta-Analyses/Scoping Reviews (PRISMA-ScR) guidelines (Tricco et al., 2018). Given the conceptual ambiguity surrounding MTWB and the nascent nature of this research area, a scoping methodology was selected to map the breadth of literature while accommodating diverse methodological approaches and terminology variations.

3.2 Search strategy and sources

Database searches were conducted using Elsevier and EBSCOhost platforms across Scopus, PsycINFO, Academic Search Complete, Education Source, and ERIC. Additionally, fifteen key mathematics education and teacher education journals were manually searched to ensure comprehensive coverage.

Search terms targeted wellbeing constructs with both negative and positive aspects (wellbeing OR well-being OR ill-being) and related hedonic and eudemonic concepts (flourish* OR thriv* OR burnout OR resilience OR stress OR enjoyment OR functioning OR pleasure OR wellness OR fulfilment OR anxiety OR affect OR

"job satisfaction" OR hope OR optimism OR self-effica*). These were combined with mathematics education terms (math* OR "mathematics education" OR numeracy[1]) and in-service teacher descriptors (teach* OR in-service OR educator) within school contexts (school AND secondary OR high OR middle OR primary OR elementary). Search strings were restricted to publication titles and abstracts to maintain focus.

3.3 Eligibility criteria

Studies were included if they were: (1) peer-reviewed journal articles published in English from 2004-2024; (2) focused on wellbeing-related topics (hedonic and/or eudemonic dimensions); (3) involved in-service primary teachers (specifically relating to mathematics teaching) or secondary mathematics teachers; (4) conducted within school mathematics education contexts; and (5) employed quantitative, qualitative, or mixed-methods designs. Studies were excluded if they focused on pre-service teachers, involved an unclear distinction of mathematics from other STEM disciplines, or were psychometric validation studies

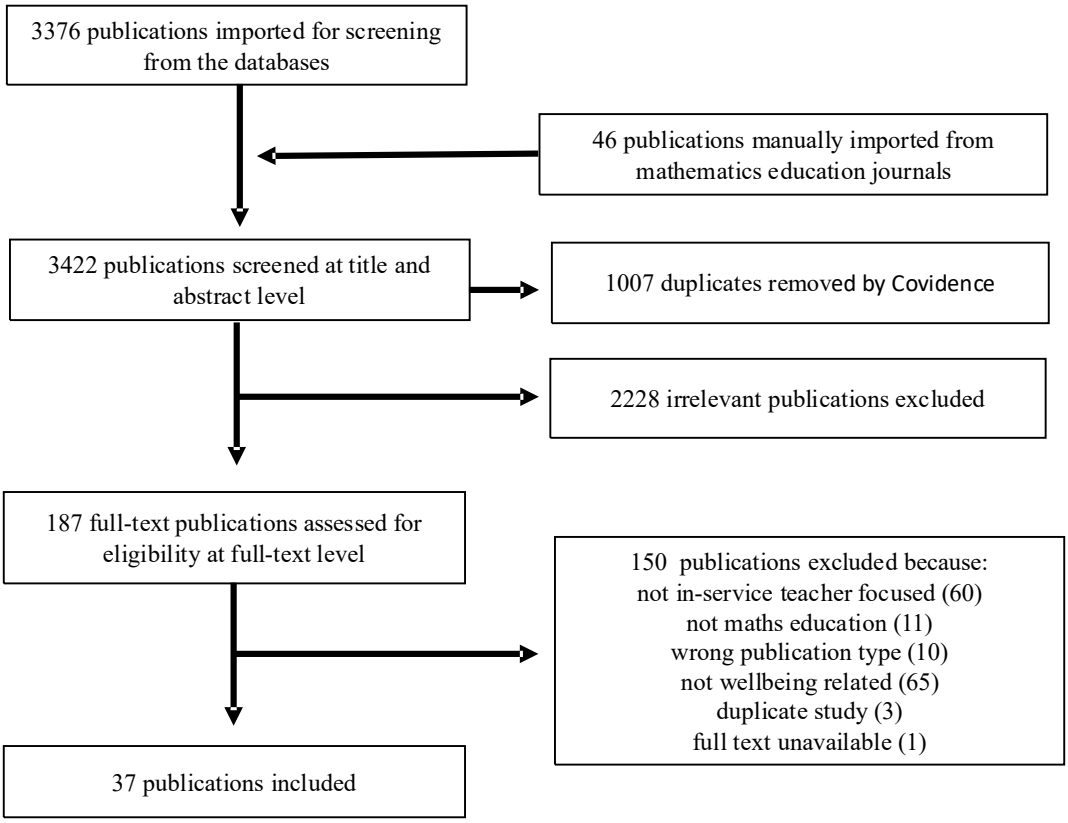
3.4 Study selection and data extraction

The search yielded 3,422 publications, with 3,376 imported into Covidence after removing manual search duplicates. Following automatic duplicate removal (n=1,007) and manual screening against inclusion criteria (n=2,228 excluded), 187 articles progressed to full-text review. Ultimately, 37 publications met all inclusion criteria. This process is summarized in Figure 1.

Data extraction captured: author details, publication year, country/region, teaching level, study aims, methodology, explicit wellbeing definitions, hedonic aspects, eudemonic aspects, and contributing/antecedent factors.

[1] Numeracy was included as a search term because Australian primary teachers often use the term ‘numeracy’ instead of ‘mathematics’

Figure 1. PRSIMA flowchart



3.5 Categorization of hedonic and eudemonic dimensions

Studies were categorized based on their primary wellbeing outcome variables as hedonic or eudemonic in focus. Hedonic aspects included any focus on emotions, feelings, or mood states. Eudemonic aspects encompassed elements of optimal functioning, including accomplishment, self-efficacy, meaning and purpose, positive relationships, and engagement.

The categorization process involved examining each study's main outcome variables to determine whether they primarily addressed hedonic (feeling good) or eudemonic (functioning well) dimensions of wellbeing, or both. For each primary outcome, we also extracted all associated contributing factors regardless of their hedonic or eudemonic nature. For example, if a study focused on teachers' mathematics anxiety or burnout (hedonic outcome), we also explored the surrounding antecedent or triggering factors contributing to this negative emotion, which could include both eudemonic factors (e.g. low self-efficacy, lack of relational support) and hedonic factors (e.g. disliking of mathematics).

3.6 Extraction of positive and negative contributing factors

To extract the contributing factors, we scrutinized the findings of each article, extracting potential 'causal' or antecedent factors contributing to teachers' hedonic aspects (e.g., positive or negative emotions) or eudemonic (e.g., self-efficacy). For example, Martinez-Sierra et al. (2022, p. 590) reported that a "Lack of interest and motivation of students in the class" in turn "triggered" mathematics teachers' distress, reproach, and anger. Similarity, a primary teacher from Askew and Venkat's (2017) study expressed that "learning maths can be such fun and enjoyable if you have love for it and also if you are confident about what you are teaching (Grade 1 teacher)". From this quote, we deduced that the contributing factors of their fun/enjoyment (categorised as hedonic) were positive attitudes toward mathematics and confidence. These contributing factors are summarized in Table 2.

4 Results

4.1 Definitions of wellbeing in mathematics teacher research

Of the 37 studies reviewed (for all references and extracted data see Hill & Marschall, under review), 15 (41%) explicitly mentioned "wellbeing" yet only five of these provided a clear definition (see Table 1). From these 15 studies, eight positioned wellbeing as a central concept (i.e. a focus of the study), while seven used the term in general framing discussions.

Three additional studies operationalized wellbeing through measurement tools (e.g. surveys) without providing explicit definitions: Wang et al. (2022) referenced "occupational wellbeing" using an adapted PISA 2021 framework; Willis et al. (2023) used the World Health Origination (WHO-5) scale, which included mostly hedonic components, to measure "wellbeing while teaching mathematics"; and Yeigh et al. (2023) also measured "wellbeing whilst teaching mathematics" using only hedonic items. The remaining 22 studies (59%) made no reference to wellbeing although investigating related constructs like satisfaction, self-efficacy, or meaning at work.

Table 1. Explicit definitions used (n = 5 studies)

Study	Wellbeing terms used	Definition excerpt
Karakus et al. (2021)	Affective wellbeing	“"Strength and regularity of good and bad feelings and state of mind" (p. 239)
Mattern & Bauer (2014)	Affective and occupational wellbeing	“comprising affect, cognitions, motivations, behaviors, and self-reported physical health… the presence of job satisfaction and the absence of perceived stress and emotional exhaustion” (p. 60)
Collie & Martin (2017)	General wellbeing	“positive evaluations of and healthy functioning at work” (p. 31)
Shoshani (2021)	Professional wellbeing	“meaning at work, teaching satisfaction, positive and negative emotions, teaching efficacy and emotion regulation efficacy” (p. 744)
Jian et al. (2023)	Subjective wellbeing	“experience, happiness, emotions, life goals, competencies, and a person’s abilities” (p. 5)

4.2 Hedonic aspects and contributing factors

Drawing on our theoretical lens, defining wellbeing as both hedonia and eudemonia, we use these two categories to classify the literature. A majority of studies (33 of 37) reported on mathematics teachers' hedonic outcomes These mostly focused on only negative emotional experiences (n = 32/33 studies, e.g. Atnufu et al., 2014), 12 studies explored both positive and negative emotions (e.g. Askew & Venkat, 2017). Only Russo, Powers et al. (2023) focused exclusively on positive emotions.

The negative emotions reported across studies included: Anxiety (14 studies), stress (5), anger (4), burnout (3), emotional exhaustion (3), frustration (3), disappointment (2), dislike (2), distress (2), doubt (2), reproach (2), and individual incidences reporting on confusion, depression, discomfort, embarrassment, feeling "stuck", fear, guilt, hatred, hostility, inadequacy, irritability, neglect, outrage, pressure, regret, remorse, sadness, shame, being scared, upset, and worry.

The positive emotions reported included: satisfaction (8 studies), enjoyment (6), pride (4), enthusiasm (3), comfort (2), interest (2), appreciation (2), happiness (2), and individual instances reporting on active/vigorous, calm, cheerful, eustress, feeling inspired, gloating, gratification, gratitude, feeling lifted, and love.

Table 2 summarizes the types of contributing factors (positive and negative) extracted from the 33 hedonic focused studies.

Table 2. Contributing hedonic factors (n = 32 studies)

Contributing factor	**Positive factors fostering MTWB**	**Negative factors thwarting MTWB**
Social connections & support	Leadership and administrative support; belonging to school; collegial relationships and collaboration; positive parent-teacher interactions; recognition from stakeholders	Workplace incivility; isolation; lack of stakeholder support
Mathematics teacher identity & relationship to maths	Strong identification as mathematics teacher; enthusiasm to be a mathematics teacher; belonging to mathematics community; positive attitudes toward mathematics; positive prior mathematics experiences; valuing mathematics	Not identifying as a mathematics teacher; feeling like an outsider in mathematics community
Content knowledge & competence	Mathematics content knowledge; problem-solving abilities; mathematical thinking; Technological Pedagogical Mathematical Knowledge (TPMK)	Limited mathematics knowledge; lower qualifications in mathematics; difficulty verifying mathematical work publicly
Personal factors	Self-reflection and regulation practices; autonomy; work engagement/cognitive and behavioural engagement;	Emotional dissonance; inability to manage emotions
Professional trajectories & professional learning	Teaching experience; professional learning communities; positive feedback on practice; mathematics specific professional development	Limited teaching experience; external pressures (tests, leadership); time constraints; government policy; school politics; inadequate working conditions; High-stakes examinations; assessment demands
Curriculum & pedagogical coherence		Reform implementation difficulties; content density; restrictive curriculum boundaries; conflicting approaches (procedural vs. conceptual); direct instruction approaches
Student factors	Positive behaviours; active participation; demonstrated interest; peer support; autonomous engagement; mathematical growth; conceptual understanding; achievement and good results; "light bulb" moments; building confidence; positive student mathematical dispositions/attitudes	Student disengagement; disruptive behaviour to lesson flow; poor attitudes to learning; lack of motivation; competency gaps; misconceptions; perceiving mathematics as irrelevant; not completing homework; negative mathematical dispositions/attitudes

4.3 Eudemonic aspects and contributing factors

Only 10 from 37 studies focused on the eudemonic aspects of MTWB, summarized in Table 3. This mostly included general teacher confidence or self-efficacy (5 studies), one study explored mathematics specific self-efficacy (Hurdle, 2020), two studies

referenced regulation and meta-cognitive strategies, one study explored mathematics teachers' sense of meaning or purpose (Shoshani, 2021). Collie and Martin (2017) reported on healthy functioning at work encompassing work engagement, work participation and positive career aspiration.

Table 3. Contributing eudemonic factors (*n* =10 studies)

Contributing factor	**Positive factors fostering MTWB**	**Negative factors thwarting MTWB**
Organisational support & autonomy	Perceived autonomy support from principals; organisational support	Concerns about insufficient time for reform implementation; concerns about minimal guidelines for reform realization
Professional competence & maths PLD	High teacher self-efficacy in teaching mathematics; mathematics competence; mastery experiences of success;; thinking of past accomplishments	
Professional learning	professional development using manipulatives and dialogue	
Pedagogical values & vision	Ability to realise own mathematics didactical vision and values	Concerns about insufficient information about reform philosophy and goals related to problem-solving; lecture style, non-dialogic professional development; concerns about complex and confusing reform approaches; concerns about reform promoting algorithmic thinking over reasoning
Personal relationship with mathematics	Positive attitude towards mathematics; value attributed to mathematics; positive past experiences with mathematics; positive affective states;	Negative past experiences with mathematics
Personal factors	Emotional commitment to the profession; growth mindset; resilience; adaptability to manage new demands; fulfilling basic psychological needs; job crafting	
Student factors	Feedback from students about successful teaching	Students' reluctance to engage with reform-mandated approaches; familial influences on students' outcomes

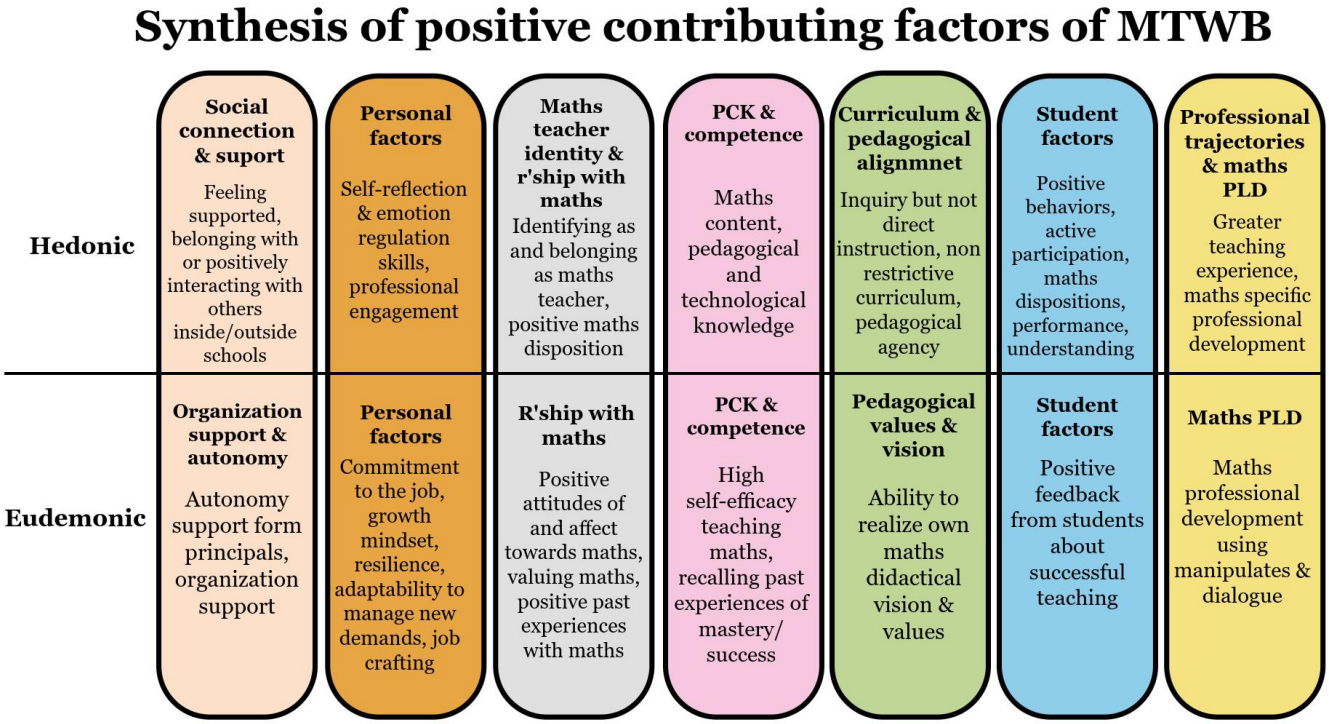
5 Discussion

This scoping review examined how mathematics teacher education research has engaged with wellbeing constructs, revealing significant gaps in both conceptual

clarity and empirical focus. Of 37 studies, less than half explicitly mentioned wellbeing, with only five providing explicit definitions. The predominant focus on hedonic aspects (89% of studies) contrasted with limited attention to eudemonic dimensions, despite evidence suggesting that the latter more strongly predict teacher wellbeing (Zhou et al., 2024).

5.1 Contributing factors of MTWB

Figure 2. Synthesis of positive contributing factors



As shown in Figure 2, overlapping themes emerged when examining factors contributing (i.e., positive factors) to both hedonic and eudemonic dimensions, revealing interconnected systems that influence MTWB. For example, social connections and support systems appeared across both dimensions, with collegial relationships, administrative support, being valued by the community, and positive student interactions consistently promoting both hedonic and eudemonic MTWB. Student factors operated bidirectionally: positive student behaviors, engagement, mathematical growth and achievement enhanced both teacher emotions (e.g. Hwang, 2020; Martinez-Sierra, 2022) and self-efficacy (e.g. Charalambous & Philippou (2010), while disruptive behavior, disengagement, and negative mathematical attitudes undermined wellbeing across both domains (e.g. Asli, 2022; Katz & Stupel,

2016). Other personal and professional factors showed similar cross-dimensional patterns, with self-reflection, autonomy, work engagement, and teaching experience serving as enablers (e.g. Mujtaba & Reiss, 2013), while time constraints, and emotional dissonance created barriers to MTWB (e.g. Goetz et al. (2015). Mathematics-specific factors added unique dimensions, including mathematical content knowledge and identification as a mathematics teacher associated with both hedonic and eudemonic aspects (e.g. Jian et al., 2023; Xenofontos & Andrews, 2020), while pedagogical tensions (e.g. between algorithmic and problem-solving approaches), curriculum density and reform, and students' negative mathematical dispositions and anxieties created subject-specific stressors (e.g. Charalambous and Philippou 2010).

These patterns align with and extend Hascher and Waber's (2021) categorization of teacher wellbeing predictors into objective versus subjective factors across individual and contextual levels. Our findings support their identification of social relationships as pivotal, while revealing how both general teaching factors (e.g. workload, collegial support, student behavior) and mathematics-specific factors (e.g. mathematical identity, pedagogical coherence, content knowledge) operate simultaneously to influence MTWB. The bidirectional nature of many factors—where student mathematical dispositions, teacher mathematical anxiety, and pedagogical tensions can simultaneously be wellbeing outcomes and predictors—supports Hascher and Waber's call for domain-specific wellbeing frameworks that acknowledge how general teaching demands intersect with subject-specific challenges to create unique wellbeing profiles for mathematics teachers.

5.2 Theoretical inconsistencies and the absence of eudemonic aspects

The findings reveal the lack of clear, explicit definitions of wellbeing in mathematics teacher research. This limits the capacity to clearly articulate, measure, and apply wellbeing constructs (i.e. MTWB literacy) in mathematics-specific contexts. This conceptual fragmentation is compounded by what Hascher and Waber (2021) identify as insufficient differentiation between wellbeing dimensions (e.g. hedonic and eudemonic) and wellbeing correlates in teacher wellbeing research. This "jingle-jangle" problem, where similar wellbeing constructs are labelled differently across studies while different constructs share labels, undermines the theoretical coherence and practical application of MTWB research. These conceptual challenges reflect broader issues in teacher wellbeing research.

Additionally, Hascher and Waber (2021) note that clear differentiation between wellbeing dimensions and wellbeing correlates (what we term contributing factors) remains lacking, with many studies conflating predictors, outcomes, and the construct itself. Our categorization of contributing factors as positive (fostering MTWB) and negative (thwarting MTWB) addresses this concern by explicitly distinguishing between wellbeing experiences (hedonic and eudemonic) and their antecedents, providing clearer theoretical boundaries for future mathematics teacher wellbeing research. This distinction is particularly important in mathematics education, where factors like mathematical anxiety can simultaneously be a wellbeing outcome and a predictor of future wellbeing experiences

Notably, across the studies, there was limited attention to eudemonic aspects of MTWB. This is problematic given Zhou et al.'s (2024) meta-analysis showed that eudemonic factors (e.g. Huta & Waterman, 2014) were the strongest predictor of teacher wellbeing. While self-efficacy (a eudemonic factor) is often explored in mathematics teacher research (e.g. Hurdle, 2020; Xenofontos & Andrews, 2020), other dimensions of positive functioning—purpose through mathematics teaching, belonging to mathematics education communities, sense of professional engagement—remain underexplored. Future research should widen its scope to explore other eudemonic experiences of mathematics teachers.

5.2 Deficit orientation in mathematics teacher research

Most studies (86%) documented the negative emotional experiences of teachers (e.g., stress, anxiety, frustration), with only one study focusing exclusively on positive emotions. This over representation of negative emotional experiences reflects what can be characterized as a deficit discourse in MTWB research. This pattern mirrors broader concerns about deficit narratives in mathematics education more generally (Adiredja & Louie, 2020), potentially reinforcing cultural assumptions about mathematics as overly difficult and anxiety-provoking. While understanding challenges is important, this imbalance limits understanding of what enables mathematics teachers to flourish. The predominance of anxiety research (14 studies) over investigations of mathematical enjoyment (6 studies) or pride (4 studies) suggests missed opportunities to highlight the strengths and enablers of mathematics teachers.

5.3 Limitations and future directions

This scoping review has several limitations, including the 20-year timeframe potentially missing earlier foundational work, restriction to English-language publications, and the exploratory nature of categorization which may have overlooked nuanced distinctions between constructs. Additionally, the focus on peer-reviewed articles may have excluded relevant grey literature and practitioner perspectives. These limitations also point to several future research directions. For example, to develop MTWB literacy requires the precise language of mathematics teachers and clear conceptual frameworks that resonate with practitioners' lived experiences. To address this gap, a follow-up prototype analysis is underway with mathematics teachers in England and Australia, incorporating lay perspectives and the language of mathematics teachers. This practitioner-informed approach will be integrated with findings from this review to create a theoretically grounded yet practically relevant MTWB framework.

6 Conclusion

This review reveals that current mathematics teacher wellbeing research reflects broader deficit discourses that characterize much of mathematics education, limiting our understanding of what enables teachers to thrive in their professional roles. The predominant focus on negative emotional experiences, coupled with limited attention to eudemonic functioning, represents a significant missed opportunity to develop comprehensive support frameworks. Moving forward, the field requires an anti-deficit, strength-based discourse supported by robust theoretical frameworks that capture both the challenges and rewards unique to mathematics teaching. Only through such integrated approaches can the field move beyond deficit narratives toward understanding what enables mathematics teachers—and by extension, their students—to flourish in and through mathematics.

Acknowledgements

Thank you to Lynda Rosman for all her support with this review, including data screening and extraction. This research project was funded by: The Research Development Fund from the Faculty of Education, University of Cambridge, England; and the Faculty of Education Researcher Development Funding Scheme,

University of Melbourne, Australia.

References

Adiredja, A. P., & Louie, N. (2020). Untangling the web of deficit discourses in mathematics education. *For the Learning of Mathematics*, *40*(1), 42-46.

Arksey, H., & O'Malley, L. (2005). Scoping studies: Towards a methodological framework. *International Journal of Social Research Methodology: Theory and Practice*, *8*(1), 19-32. https://doi.org/10.1080/1364557032000119616

Asli, A. (2022). Israeli post-primary teacher's attitudes towards teaching mathematics. *PedActa*, *12*(1), 17-26. https://doi.org/10.24193/PedActa.12.1.3

Askew, M., & Venkat, H. (2017). "I Hate Maths": Changing primary school teachers' relationship with mathematics. In U. Xolocotzin Eligio (Ed.), *Understanding emotions in mathematical thinking and learning* (pp. 339-354). Academic Press. https://doi.org/10.1016/B978-0-12-802218-4.00013-3

Asthana, A., & Boycott-Owen, M. (2018). "Epidemic of stress" blamed for 3,750 teachers on long-term sick leave. *The Guardian*, 11 January. https://www.theguardian.com/education/2018/jan/11/epidemic-of-stress-blamed-for-3750-teachers-on-longterm-sick-leave

Atnafu, M. (2014). Secondary school mathematics teachers' attitude in teaching mathematics. *International Electronic Journal of Mathematics Education*, *9*(1), 57-72.

Beames, J. R., Li, S. H., Newby, J. M., Maston, K., Christensen, H., & Werner-Seidler, A. (2023). The effectiveness of universally delivered interventions for the prevention and treatment of mental health problems in secondary school students: A systematic review and meta-analysis. *Psychological Medicine*, *53*(3), 969-982.

Charalambous, C. Y., & Philippou, G. N. (2010). Teachers' concerns and efficacy beliefs about implementing a mathematics curriculum reform: Integrating two lines of inquiry. *Educational Studies in Mathematics*, *75*(1), 1-21. https://doi.org/10.1007/s10649-010-9238-5

Collie, R. J., & Martin, A. J. (2017). Teachers' sense of adaptability: Examining links with perceived autonomy support, teachers' psychological functioning, and students' numeracy achievement. *Learning and Individual Differences*, *55*, 29-39. https://doi.org/10.1016/j.lindif.2017.03.003

Diener, E. (1984). Subjective well-being. *Psychological Bulletin*, *95*, 542-575.

Dowker, A., Sarkar, A., & Looi, C. Y. (2016). Mathematics anxiety: What have we learned in 60 years? *Frontiers* (Article 508). https://doi.org/10.3389/fpsyg.2016.00508

Dreer, B. (2023). Teacher well-being: A systematic review of the research literature from the year 2000-2019. *Educational Research Review*, *39*, 100506.

Foster, D. (2019). *Teacher recruitment and retention in England* (UK Parliament) [House of Commons Library: Briefing Paper: Number 7222].

Goetz, T., Becker, E. S., Bieg, M., Keller, M. M., Frenzel, A. C., & Hall, N. C. (2015). The Glass Half Empty: How emotional exhaustion affects the state-trait discrepancy in self-reports of teaching emotions. *PLOS ONE*, *10*(9). https://doi.org/10.1371/journal.pone.0137441

Hascher, T., & Waber, J. (2021). Teacher well-being: A systematic review of the research literature from the year 2000-2019. *Educational Research Review*, *34*, 100411.

Heintzelman, S. J. (2018). Eudaimonia in the contemporary science of subjective well-being: Psychological well-being, self-determination, and meaning in life. In E. Diener, S. Oishi, & L.

Tay (Eds.), *Handbook of wellbeing*. DEF Publishers. https://doi.org/10.4324/9781351231879-14

Hill, J. L., & Marschall, G. (2025). *Feeling good and functioning well: A scoping review of factors associated with mathematics teacher wellbeing* [Under review].

Huppert, F. A., & So, T. T. C. (2013). Flourishing across Europe: Application of a new conceptual framework for defining flourishing across Europe. *Social Indicators Research*, *110*(3), 837-861.

Hurdle, Z. B. (2020). Observing the effects of hands-on activities on mathematics teacher confidence in geometry and statistics: A case study. *Teachers and Curriculum*, *20*(1), 31-42.

Huta, V., & Waterman, A. S. (2014). Eudaimonia and its distinction from hedonia: Developing a classification and terminology for understanding conceptual and operational definitions. *Journal of Happiness Studies*, *15*(6), 1425-1456. https://doi.org/10.1007/s10902-013-9485-0

Hwang, S. (2022). Profiles of mathematics teachers' job satisfaction and stress and their association with dialogic instruction. *Sustainability*, *14*(11), 6925. https://doi.org/10.3390/su14116925

Jian, X., Wijaya, T. T., & Yu, Q. (2023). Key factors affecting mathematics teachers' well-being and stress levels: An extended engagement theory. *International Journal of Environmental Research and Public Health*, *20*(1), 548. https://doi.org/10.3390/ijerph20010548

Karakus, M., Ersozlu, Z., Usak, M., & Ocean, J. (2021). Self-efficacy, affective well-being, and intent-to-leave by science and mathematics teachers: A structural equation model. *Journal of Baltic Science Education*, *20*(2), 237-251. https://doi.org/10.33225/jbse/21.20.237

Katz, S., & Stupel, M. (2016). Enhancing elementary-school mathematics teachers' efficacy beliefs: A qualitative action research. *International Journal of Mathematical Education in Science and Technology*, *47*(3), 421-439. https://doi.org/10.1080/0020739X.2015.1080314

Kern, M. L., Benson, L., Steinberg, E. A., & Steinberg, L. (2016). The EPOCH measure of adolescent well-being. *Psychological Assessment*, *28*(5), 586-595.

Kern, M. L., & Wehmeyer, M. (2021). *(Eds). The Palgrave handbook of positive education*. Palgrave Macmillan.

Martínez-Sierra, G., Arellano-García, Y., & Hernández-Moreno, A. (2022). Which situations trigger emotions of secondary school mathematics teachers? *International Journal of Science and Mathematics Education*, *20*(3), 575-595. https://doi.org/10.1007/s10763-021-10158-1

Mattern, J., & Bauer, J. (2014). Does teachers' cognitive self-regulation increase their occupational well-being? The structure and role of self-regulation in the teaching context. *Teaching and Teacher Education*, *43*, 58-68. https://doi.org/10.1016/j.tate.2014.05.004

Mujtaba, T., & Reiss, M. (2013). Factors that lead to positive or negative stress in secondary school teachers of mathematics and science. *Oxford Review of Education*, *39*(5), 627-648. https://doi.org/10.1080/03054985.2013.840279

Oades, L. G., Baker, L. M., Francis, J. J., & Taylor, J. A. (2021). Wellbeing literacy: A capability approach. In M. L. Kern & M. L. Wehmeyer (Eds.), *The Palgrave handbook of positive education* (pp. 323-346). Palgrave Macmillan.

Oades, L. G., Baker, L. M., Francis, J. J., & Taylor, J. A. (2022). Wellbeing literacy and positive education. In M. L. Kern & M. L. Wehmeyer (Eds.), *The Palgrave handbook of positive education* (pp. 325-343). Palgrave Macmillan.

Russo, J., Powers, T., Hubbard, J., Buckley, S., & Livy, S. (2023). How often and when teachers should teach with challenging tasks: The role of motivational beliefs. *Journal of Mathematics Teacher Education*. https://doi.org/10.1007/s10857-023-09612-4

Ryan, R. M., & Deci, E. L. (2001). On happiness and human potentials: A review of research on hedonic and eudemonic well-being. *Annual Review of Psychology*, *52*, 141-166. https://doi.org/10.1146/annurev.psych.52.1.141

Seligman, M. E. P. (2011). *Flourish: A visionary new understanding of happiness and well-being*. Free Press.

Sibieta, L. (2020). *Teacher shortages in England: Analysis and pay options*. Education Policy Institute.

Tricco, A. C., Lillie, E., Zarin, W., O'Brien, K. K., Colquhoun, H., Levac, D., Moher, D., Peters, M. D. J., Horsley, T., Weeks, L., Hempel, S., Akl, E. A., Chang, C., McGowan, J., Stewart, L., Hartling, L., Aldcroft, A., Wilson, M. G., Garritty, C., … Straus, S. E. (2018). PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and explanation. *Annals of Internal Medicine*, *169*(7), 467-473. https://doi.org/10.7326/M18-0850

Wang, L., Peng, F., & Song, N. (2022). Organizational support and job crafting with the new math teachers' well-being: The mediating effect of basic psychological needs. *Frontiers in Psychology*, *13*, 961702. https://doi.org/10.3389/fpsyg.2022.961702

Willis, R., Lynch, D., Peddell, L., Yeigh, T., Woolcott, G., Bui, V., Boyd, W., Ellis, D., Markopoulos, C., & James, S. (2023). Development of a teacher of mathematics identity (ToMI) scale. *Mathematics Education Research Journal*, *35*(S1), 107-132. https://doi.org/10.1007/s13394-021-00391-w

Xenofontos, C., & Andrews, P. (2020). The discursive construction of mathematics teacher self-efficacy. *Educational Studies in Mathematics*, *105*(2), 261-283. https://doi.org/10.1007/s10649-020-09990-z

Yeigh, T., Willis, R., James, S., Lake, W., Lynch, D., Peddell, L., Knight, B., Lee, M., & Samojlowicz, D. (2023). Teacher of mathematics identity as a predictor of teacher wellbeing. *The Australian Educational Researcher*, *50*(5), 1403-1420. https://doi.org/10.1007/s13384-022-00553-0

Zhou, S., Slemp, G. R., & Vella-Brodrick, D. A. (2024). Factors associated with teacher wellbeing: A meta-analysis. *Educational Psychology Review*, *36*(2), 63. https://doi.org/10.1007/s10648-024-09886-x