

Factors central to mathematics teacher wellbeing: What matters most to mathematics teachers in England and Australia

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Abstract

Teacher wellbeing remains a critical concern worldwide, with poor wellbeing increasingly recognised as a driver of teacher attrition and workforce instability. Despite substantial research on teacher wellbeing, existing wellbeing frameworks rarely attend to what teachers of mathematics consider most central to their wellbeing. This exploratory study reports findings from a two-phase prototype analysis conducted with primary and secondary mathematics teachers in England ($n = 61$) and Australia ($n = 76$). Findings reveal that teachers from both countries consider a manageable workload the most important, followed by positive professional relationships, pedagogical autonomy, feeling valued, and mathematics-specific confidence and knowledge. Significant country differences show greater centrality of collaborative professional practice among English teachers. Primary-secondary sector comparisons, controlling for country, show greater centrality of a uniform approach to teaching mathematics among English primary teachers.

1. Introduction

Being tightly interwoven with teaching quality, student wellbeing and teacher retention (Harding et al., 2019; Kern & Wehmeyer, 2021; McCallum et al., 2017; Roffey, 2012), teacher wellbeing is fundamental to a thriving education system (McCallum et al., 2017). Unfortunately, global research continues to paint a concerning picture about teacher wellbeing (TES, 2026), with narratives in countries like England revolving around an epidemic of stress (Asthana & Boycott-Owen, 2018; Tapper, 2018) and an educational crisis (Falecki & Mann, 2021). Despite the urgent need to address teacher wellbeing, little is still understood about the concept itself (particularly considering mathematics teachers). The reason for this can be threefold: a broad spectrum of definitions and descriptions of wellbeing (Jian et al., 2023), underpinned by different theoretical perspectives; a lack of discipline specificity across the different conceptualisations (Hascher & Waber, 2021), or a rare attention to what teachers themselves consider to be the most important in their professional thriving and fulfilment.

Value Fulfilment Theory (Tiberius, 2018) suggests that the things individuals consider important are context-specific and can differ significantly across subject contexts or disciplines. In the context of mathematics teaching, this means that some aspects that mathematics teachers consider important to their professional lives (e.g. public perception of inherent mathematical abilities or student conceptual understanding of mathematics) may have a meaningful impact on their wellbeing; yet they remain invisible in generic teacher wellbeing frameworks (Hascher & Waber, 2021; Hill & Marschall, under review). This conceptual difficulty has significant implications, making the operationalisation of wellbeing frameworks in particular contexts, such as the mathematics teaching profession, difficult to implement effectively (Hascher & Waber, 2021).

In this article, we begin to address this issue by examining what mathematics teachers consider central to their wellbeing. This approach provides the potential to identify both general and subject-specific,

professionally situated factors that may underpin teacher flourishing (or its absence), extending generic wellbeing frameworks by addressing what may otherwise be overlooked.

2. Literature review

A recent scoping review of two decades of research related to mathematics teacher wellbeing (Hill & Marschall, under review) identified eight studies that focused explicitly on exploring the wellbeing of mathematics teachers (e.g. Collie & Martin, 2017; Jian et al., 2023; Karakus et al., 2021; Mattern & Bauer, 2014; Shoshani, 2021; Wang et al., 2022; Willis et al., 2023; Yeigh et al., 2023). Findings from these studies suggest that wellbeing of mathematics teachers is positively associated with several interrelated factors: perceived teacher autonomy support and adaptability (Collie & Martin, 2017); teacher knowledge, cognitive and behavioural engagement (Jian et al., 2023); teacher self-efficacy (Karakus et al., 2021); cognitive self-regulation (Mattern & Bauer, 2014); growth mindset (Shoshani, 2021); job crafting (Wang et al., 2022); and mathematics teacher identity (Willis et al., 2023; Yeigh et al., 2023). While offering valuable insights, these findings represent only a preliminary exploration of the complex and multifaceted nature of wellbeing of teachers of mathematics. Notably, all eight studies draw on general wellbeing frameworks (e.g. Seligman's (2011) PERMA model, Ryan and Deci's Self-Determination Theory, affective wellbeing and so on). This raises an important question: Do such frameworks capture what can be distinctive about the professional wellbeing of mathematics teachers whose daily work is organised around specific demands, relationships, and the disciplinary culture of mathematics teaching?

Our familiarity with research and the professional landscape of mathematics teacher education led us to suspect that the factors shaping wellbeing of teachers of mathematics might extend beyond what these studies had identified. Moreover, given that teacher attrition in STEM (including mathematics) is greater than in other subjects, we suspected that aspects of the discipline itself could be contributing to the wellbeing struggles that, in turn, drive attrition. A wider search strategy, extending beyond studies that referred to explicitly wellbeing and including research related to teachers' feelings, emotions and their ability to function well in their mathematics teaching (guided by a definition of wellbeing of feeling good and functioning optimally, Huppert & So, 2013), yielded a picture of factors associated with wellbeing of mathematics teachers across two broad domains: general professional factors that might be relevant across subject disciplines, and subject-specific factors related to mathematics (Hill & Marschall, under review; Marschall & Hill, 2026).

Considering general professional factors, wellbeing of mathematics teachers was seen to be affected by teachers' ability to engage with reflective practice (e.g. Andrà et al., 2019; García González & Martínez Sierra, 2020; Mujtaba & Reiss, 2013), institutional autonomy and leadership support (e.g. Hwang, 2022; Jentsch et al., 2023; Yeigh et al., 2023), relatedness, belonging and strong relationships with staff, parents and students (e.g. Martínez-Sierra et al., 2022), adequate working conditions (e.g. Jentsch et al., 2023), positive feedback on practice, professional learning communities (e.g. Hurdle, 2020), self-regulatory personal characteristics such as: resilience, ability to manage emotions, adaptability (e.g.

Collie & Martin, 2017; Shoshani, 2021; Xenofontos & Andrews, 2020). Taken together, these factors speak to the broader professional context in which mathematics teachers work.

Considering more distinct facets of wellbeing of mathematics teachers, we see aspects such as low mathematical qualifications, limited knowledge and confidence, and inability to correct one's own mistakes when working with mathematics having a negative impact on teacher wellbeing through feelings of shame, anxiety and stress (e.g. Artemenko et al., 2021; Atnafu, 2014; Dove et al., 2021; García González & Martínez Sierra, 2020; Patkin & Greenstein, 2020). On the contrary, strong subject knowledge, ability to engage with challenging mathematical tasks, and mathematics self-efficacy were associated positively with teacher wellbeing through feelings of enjoyment, fulfilment and decreased stress (Jian et al., 2023; Küçüktepe & Balkan, 2021; Ping et al., 2018; Russo, Powers et al., 2023; Yorulmaz et al., 2017). Specific to teachers' relationships with mathematics itself, challenging past experiences with the subject and with their own past mathematics teachers influenced the teachers' ability to function effectively (Xenofontos & Andrews, 2020), while the teachers' positive attitudes towards mathematics contributed to positive feelings and increased motivation (Atnafu, 2014; Chatzistamatiou et al., 2014). Mathematics teacher identity and the feeling of belonging to the community of those who 'can do mathematics' also correlated positively with enthusiasm and positive feelings towards their professional work (Askew & Venkat, 2017; García González & Martínez Sierra, 2020; Yeigh et al., 2023).

Although some of these factors might not be unique to mathematics teaching, the reviewed research suggested that their impact on teacher wellbeing is frequently shaped by a dichotomised framing of mathematics as a discipline (Marschall & Hill, 2026). More specifically, public and policy discourse around mathematics tends to place greater value on fixed ability, fast calculations, and correct answers than on process. Within such a context, visible mathematical struggle or making errors can directly threaten teachers' sense of credibility, identity, and professional confidence in ways that may not apply to other subjects. Widely perpetuated social narratives about inherited mathematical ability compound this issue, meaning that professional vulnerability in mathematics carries a weight that extends beyond personal discomfort to a more fundamental challenge to teachers' sense of identity and belonging within the discipline community (Marschall & Hill, 2026).

The same dichotomy presents difficulties in relation to mathematics curriculum design and pedagogy (Marschall & Hill, 2026). On the one hand, teachers of mathematics experienced frustration, stress, anxiety and anger when forced to work under policies which prioritised or advocated direct instruction, rote learning and memorisation of facts, promoting algorithmic approaches to learning mathematics, assessed through rigid summative processes (Andrà et al., 2019; Charalambous & Philippou, 2010; Jiang et al., 2021). On the other hand, mathematics teachers felt that they could do their job well (i.e. function well) when they were able to realise a pedagogical vision aligned with their own beliefs about mathematics and its teaching, related to, for example, supporting students in developing conceptual understanding of mathematics (Charalambous & Philippou, 2010; Xenofontos & Andrews, 2020). Students' mathematical learning and relationships with mathematics were also central to how teachers experienced their daily professional lives. For example, students' deep conceptual understanding and

ability to construct their own knowledge through collaborative work contributed to teachers' feeling of enjoyment, pride and happiness (Kourti & Potari, 2024; Martínez-Sierra et al., 2019; Russo, Bobis, et al., 2023).

In sum, the review revealed a rich and complex web of factors that shape how mathematics teachers feel and function in their professional lives (Hill & Marschall, under review). The factors encompass not only general professional aspects, such as pedagogical autonomy or supportive relationships, but also factors tied to specific orientations towards mathematics as a discipline: productive struggle over algorithmic approaches and correct answers, prioritising students' conceptual understanding over procedural fluency, and challenging the pervasive myth of fixed mathematical ability. However, given the scarcity of research on mathematics teacher wellbeing identified by the review, several questions remained unanswered. When asked explicitly about their wellbeing in the context of mathematics teaching, which factors would mathematics teachers consider most central to this wellbeing? Would potential patterns of centrality vary across professional contexts, such as school sectors, national settings, and levels of teaching experience? Consequently, these questions motivated the study reported here.

The present study reports findings from a two-phase prototype analysis conducted with teachers of mathematics in England and Australia. The study is exploratory in character, seeking to generate a grounded account of what mathematics teachers consider to be central to their professional wellbeing, and to examine how this picture varies across different groups. The study was guided by the following research questions:

RQ1: What factors do mathematics teachers consider most central to their professional wellbeing in the context of mathematics teaching?

RQ2: To what extent do these centrality ratings differ between teachers in England and Australia?

RQ3: To what extent do these centrality ratings differ between primary-secondary sectors?

RQ4: To what extent do the centrality ratings differ depending on the level of teaching experience?

3. Research design and methodology - Prototype analysis

This study employed a prototype analysis approach. Prototype analysis, which has been typically used to identify the common conceptualisations that occur across a population (Huang et al., 2022), is particularly well-suited to exploring fuzzy concepts with indistinct boundaries (Lamber et al., 2009) and has previously been used in research looking at concepts such as forgiveness (e.g. Kearns & Finchman, 2004), gratitude (Lamber et al., 2009), or general teacher wellbeing (e.g. Vo et al., 2024).

A classical view of concept construction relies on a strict set of rules and features when determining the membership of constructs under a particular concept. However, this static view fails to account for the dynamism and fluidity of concepts within real-life contexts. In contrast, the prototype theory focuses on

a much more flexible understanding of constructs, categorised by average instances and centrality of its different characteristics (Rosch, 1975)—prototype theory argues that concepts are structured around typical cases instead of strict rules, with categories defined by their central or most common members. This is important, since it reflects the idea that constructs' membership is not determined by sharing all characteristics, but rather that members can resemble the prototype concept to varying degrees.

According to Rosch (1975), for a concept to be considered prototypical, individuals must be able to list its associated components and then rate their centrality (i.e. importance) relative to the concept of interest. As a result, individuals might define achieving wellbeing more in terms of their relationships with mathematics or their pedagogical autonomy than in terms of the ability to realise curricular goals or subject knowledge. In this sense, the centrality ratings generated in prototype analysis map onto a continuum. A factor rated as highly central by a mathematics teacher is one that they consider important and worth pursuing in the context of their professional work; a factor rated as peripheral is one that, while perhaps present, carries less weight in their overall sense of professional wellbeing. This framing also helps make sense of variation across groups of teachers. If the factors that teachers rate as most central differ between primary and secondary teachers, or between teachers in England and Australia, this might suggest that what mathematics teachers consider most important about their professional lives is shaped by the specific contexts in which they work. Exploring these similarities and differences is therefore an important part of building a conceptualisation of mathematics teacher wellbeing that reflects the diversity of the mathematics teaching profession.

Prototype analysis is typically executed across three distinct phases (Rosch, 1975). The first phase involves asking individuals to freely list the features or factors they associate with the concept of interest. In the case of teacher wellbeing, teachers might be asked to elaborate on what factors they feel contribute to or hinder their wellbeing. Teachers' responses are then synthesised into a list of individual components, together with their frequencies of mention across the sample. The second phase involves providing participants with the full list of factors generated in Phase 1 and asking them to rate each according to its importance to the concept. These ratings establish the centrality of each factor. The third phase can involve scenario-based discussions with participants, the purpose of which is to verify whether the most central factors identified in Phase 2 are foregrounded in how participants conceptualise the construct.

The present study employed the first two phases of this design. The goal of these phases was to generate a list of factors associated with mathematics teacher wellbeing and then to establish the centrality of each factor. The decision not to proceed to Phase 3 was based on two considerations. First, taking an inductive approach to theory generation, we wanted to avoid the selection bias inherent in constructing hypothetical scenarios for teachers to respond to, particularly given the large and contextually diverse set of factors generated in Phase 1. Secondly, rather than presenting teachers with hypothetical scenarios, we chose to explore their conceptualisations of their wellbeing through in-depth follow-up interviews. This approach, we felt, gave greater opportunity to unpack responses as they arose. Consequently, this article reports on the two prototype analysis phases.

Participants in both phases were teachers of mathematics working in either a primary or secondary school in Australia or England. The inclusion of primary teachers was deliberate. As argued in our scoping review (Marschall & Hill, under review), primary teachers who teach mathematics engage in distinctly mathematical professional work, including sequencing mathematical learning, managing mathematics-specific anxiety and navigating the disciplinary demands of the subject. Their exclusion from research on mathematics teacher wellbeing would perpetuate an unwarranted assumption that only secondary teachers have subject-specific professional wellbeing experiences. We also expected that this approach might help paint a picture of possible differences between primary and secondary teachers in the context of mathematics teaching. Participants were recruited using personal and professional networks, social media and mathematics education associations.

In what follows, we first present the design and findings of each prototype phase, and then elaborate on the potential meaning and implications of these findings for mathematics teachers' wellbeing.

4. Phase 1: Generating factors of mathematics teacher wellbeing

4.1 Participants

Phase 1 aimed to generate the initial prototype factors contributing to mathematics teachers' wellbeing, using a free-response qualitative survey. Following the approach and recommendations of Vo et al. (2024) and drawing on our initial understanding of the field from the scoping review (Hill & Marschall, under review), we extended an invitation to any teacher currently teaching mathematics in a primary or secondary school in England or Australia. Previous prototype research does not provide clear guidelines on an appropriate sample size for this phase, with samples in previous studies ranging between 30 and 208, with an average of 133 (e.g. Bharara et al., 2019; Hone et al., 2015; Huang et al., 2022; Jarden et al., 2018; Kearns & Finchman, 2004; Luo et al., 2022; Vo et al., 2024). Consequently, we aimed to recruit between 40 and 60 participants in each country.

A total of 111 teachers participated in Phase 1, comprising 56 in Australia and 55 in England. Collectively, 32% identified as male, 67% as female, and 1% as unspecified or another gender. In addition, 20% were working in primary schools and 80% in secondary schools, although no primary teachers were recruited in England (see Table 1 for the country breakdown). Years of teaching experience (yoe) included: $yoe \leq 5\text{yrs}$ (12% of combined sample), $5\text{yrs} < yoe \leq 11\text{yrs}$ (32%), $11\text{yrs} < yoe \leq 25\text{yrs}$ (39%), $25\text{yrs} < yoe$ (17%).

Table 1
Teachers in two countries in Phase 1

Teacher sector characteristics	En <i>n</i> (%)	Aust <i>n</i> (%)	Comb <i>n</i> (%)
Primary	0 (0)	22 (39)	22 (20)
Secondary	55 (100)	34 (61)	89 (80)
Total	55 (100)	56 (100)	111 (100)
Note. En = England; Aust = Australia; Comb = combined			

4.2 Procedure

Phase 1 data collection took place between August and November 2024. Using the Qualtrics platform, teachers were asked to articulate how they thought about their wellbeing in relation to mathematics teaching. The survey prompted teachers with the following questions:

Q 2.1: This survey explores what mathematics teachers consider essential for fulfilling their wellbeing in relation to the teaching of mathematics. The focus here is on your professional wellbeing in the moment, during a mathematics lesson, and more broadly. There are no right or wrong answers. Think both broadly and specifically about what ‘wellbeing’ means to you in this context of mathematics teaching. Imagine explaining this concept to someone unfamiliar with the term. What, in your opinion, are the key features or characteristics of teacher wellbeing when teaching mathematics? Take your time and list as many features and/or characteristics as you can in the box below (these do not have to be in any particular order).

Following this, teachers were asked to elaborate on factors contributing to their wellbeing:

Q 2.2: Now think specifically about yourself and your current mathematics teaching context. What factors contribute to your wellbeing as a teacher of mathematics?

These survey questions were informed by those used in previous prototype studies of wellbeing-related constructs (e.g. Jarden et al., 2018; Vo et al., 2024) but were modified to situate teachers’ responses specifically within the context of mathematics teaching.

4.3 Analysis

Open coding of participant responses was conducted by both authors. Initially, each author coded data in their respective countries. Once these were completed, the authors collectively reviewed the coding for consistency. In cases of disagreement, disputes were resolved by consensus. A handful of discrepancies related to the breadth of the coding categories. For example, while in the Australian sample we ended up with two codes: time management and having time to reflect on my mathematics teaching, in the English sample we had five separate codes related to time management: having time to think about lessons, having time to plan, having time to cover the curricular content, and having time to explore and enjoy mathematics. Reviewing the coding and the associated phrases from both countries, we ended up with four separate codes in this theme: having time to think about and plan mathematics

lessons; having time to explore and enjoy mathematics, having time to support students inside timetabled hours; having time to reflect on my mathematics teaching, with the code 'having time to cover the curricular content' eventually shifting to a category of working with a curriculum fit for purpose. This decision was based on the teacher's detailed explanation of the fact that the time struggles to cover the curricular content related to the curriculum design, which is overcrowded with mathematical content.

Consistent with an inductive approach, open coding prioritised the language used by participants, staying as close to their teacher's own words as much as possible. Unlike previous studies, which collapsed codings into short phrases or single words, we chose to preserve detail within each coding, as far as it was considered reasonable. We did so to facilitate interpretation and reduce ambiguity for each factor in the subsequent phase of the study.

Collectively, all teachers' responses yielded 60 unique factors. Frequencies of the factors were calculated based on the number of teachers who mentioned a particular factor, rather than the total number of instances that factor was mentioned across all responses. All stages of the analysis were recorded in Excel.

4.4 Findings

4.4.1 General themes and sub-themes

All 60 factors fell broadly within five themes: professional factors, personal factors, student factors, parental factors and pedagogy. The professional factors, which represented over a half of all factors mentioned by teachers, fell within the following sub-themes: workload and time, autonomy/respect/value, collaboration, professional support, professional development, resources, curriculum and assessment, community and school-wide behaviour policy. The second largest theme, personal factors, included sub-themes: personal characteristics, knowledge and competence, own relationship with mathematics and physical health. The remaining three themes included: student factors—students' relationships with mathematics, relations with students, students' characteristics; parental factors—feeling valued and appreciated by parents; working with supportive parents/carers/families; working with parents who have realistic expectations of me as a mathematics teacher; pedagogy—engaging my students in mathematical problem-solving; engaging my students in fun mathematical activities. Figure 1 presents the themes and sub-themes of all factors, while Table 2 provides a detailed description of each factor within its theme and sub-theme.

Table 2
Themes and sub-themes encompassing all 60 factors

Theme	Number of factors	Sub-themes and individual factors
Professional factors	32	<i>Workload and time</i> (n = 7): having a manageable workload; having time to think about and plan mathematics lessons; having a reduced marking load in mathematics (through, for example, centralised and automated arrangements); having a decreased load of administrative tasks; having time, as a teacher, to explore and enjoy mathematics; having time to reflect on my mathematics teaching; having time to support students with their mathematics inside the school working hours
		<i>Autonomy/value/respect</i> (n = 6): having autonomy and trust to experiment with my mathematics teaching; having the flexibility to manage my own time outside of taught lessons; feeling valued and appreciated (by leadership, students, parents); as a mathematics teacher, feeling respected by others; receiving positive feedback and encouragement from others when teaching mathematics, being involved in mathematics department decision-making
		<i>Collaboration</i> (n = 4): working with supportive and approachable colleagues; collaborating with colleagues when planning our/my mathematics teaching; having opportunities to discuss mathematics teaching with colleagues; having a uniform way of teaching mathematics across the mathematics department
		<i>Professional support</i> (n = 4): having strong leadership support; supportive learning atmosphere for staff, which does not focus on accountability; having specialist support (from the inside and outside school), e.g. support agencies, allied health professionals, SEND departments, etc.; school's understanding of support for teachers' needs and mental health
		<i>Professional development</i> (n = 3): access to maths specific; quality mentoring for mathematics teaching; observing colleagues
		<i>Resources</i> (n = 3): having access to physical and technological resources for mathematics teaching; having my own comfortable and suitably designed classroom to teach mathematics; having a bank of shared departmental/school worked examples and solutions to mathematical content
		<i>Curriculum and assessment</i> (n = 2): working with a mathematics curriculum which is fit for purpose; working with quality mathematics assessments, which are fit for purpose
		<i>Community</i> (n = 2): having good relationships with colleagues; strong sense of school community, which celebrates everyone's small successes
Note: the factor 'feeling valued and appreciated' was mentioned in relation to leadership, students, and parents. While all three of these factors were subsequently collapsed into one survey factor, they remained separated in this table, totalling 62 factors.		

Theme	Number of factors	Sub-themes and individual factors
		<i>Schoolwide behaviour policy</i> (n = 1): Having a consistent school-wide student behaviour policy
Personal factors	19	<i>Personal characteristics</i> (n = 9): embracing continuous professional learning and growth in relation to my mathematics teaching; having resilience when teaching mathematics; being persistent in overcoming challenges when teaching mathematics; being adaptable; being organised and feeling in control in relation to my mathematics teaching; being empathetic; being patient and calm; being curious as a mathematics teacher; being self-motivated in relation to my mathematics teaching
		<i>Knowledge and competence</i> (n = 7): having high confidence in my own planning and teaching of mathematics lessons; being confident in teaching the mathematics curriculum; experiencing a sense of success in my mathematics teaching; having good mathematics subject content knowledge; being able to teach mathematics adaptively, fulfilling students' diverse needs (i.e. adaptive teaching); having a good understanding of mathematics assessment (i.e. assessment literacy); as a teacher, having a good understanding of the mathematics curriculum
		<i>Own relationship with mathematics</i> (n = 2): as a teacher, having love and passion for mathematics; having my own good/positive previous experiences with mathematics
		<i>Physical health</i> (n = 1): Having good physical health / feeling well
Student factors	6	<i>Students' relationships with mathematics</i> (n = 3): working with students who are engaged with mathematics; working with students who have positive dispositions and attitudes towards mathematics; working with students who have had good previous experiences with mathematics
		<i>Relations with students</i> (n = 2): having good relationships with students; feeling valued and appreciated (by leadership, students, parents)
		<i>Students' characteristics</i> (n = 1): Working with mathematics students who have a growth mindset
Parental factors	3	Feeling valued and appreciated (by leadership, students, parents); working with supportive parents/carers/families; working with students and parents who have realistic expectations of me as a mathematics teacher
Pedagogy	2	Engaging my students in mathematical problem-solving; engaging my students in fun mathematical activities
Note: the factor 'feeling valued and appreciated' was mentioned in relation to leadership, students, and parents. While all three of these factors were subsequently collapsed into one survey factor, they remained separated in this table, totalling 62 factors.		

4.4.2 Factor frequencies

The top ten frequencies of the coded factors of the combined sample are presented in Table 3 (all frequencies can be found in Appendix 1).

Table 3

Phase 1 prototype factors of mathematics teacher wellbeing, generated by mathematics teachers

Prototype factors	Comb freq (%)	En freq (%)	Aust freq (%)
Having a manageable workload	33 (30%)	17 (31%)	16 (29%)
Having a consistent school-wide student behaviour policy	30 (27%)	20 (36%)	10 (18%)
Having access to physical and technological resources for mathematics teaching	29 (26%)	18 (33%)	11 (20%)
Working with supportive and approachable colleagues	28 (25%)	19 (35%)	9 (16%)
Working with students who are engaged with mathematics	26 (23%)	6 (11%)	20 (36%)
Having autonomy and trust to experiment with my mathematics teaching	25 (23%)	18 (33%)	7 (13%)
Having good relationships with students	23 (21%)	12 (22%)	11 (20%)
Having time to think about and plan mathematics lessons	23 (21%)	15 (27%)	8 (14%)
Having high confidence in my own planning and teaching of mathematics lessons	19 (17%)	3 (5%)	16 (29%)
Having good mathematics subject content knowledge	17 (15%)	8 (15%)	9 (16%)
Note. freq = number of teachers who mentioned a particular factor; En = England; Aust = Australia; Comb = combined			

Among the most prominent factors across the combined sample, those mentioned by 20% or more of teachers overall, were: having a manageable workload (30% of all teachers), having a consistent school-wide behaviour policy (27%), having access to physical and technological resources for mathematics teaching (26%), working with supportive and approachable colleagues (25%), working with students who are engaged with mathematics (23%), having autonomy and trust to experiment with my mathematics teaching (23%), having good relationships with students (21%), and having time to think about and plan mathematics lessons (21%). These factors include six from the professional factors theme (two related to workload and time, and two to community and autonomy), and two that reflect relationships and working with engaged students.

These top eight factors in the combined sample aligned closely with the most prominent factors among English participants. This was except for working with students who are engaged with mathematics, which was mentioned by only 11% of English teachers. Instead, another factor mentioned by 22% of English teachers, yet again, concerned workload, i.e. having a reduced marking load in mathematics (through, for example, centralised and automated arrangements).

The pattern was somewhat different for the Australian sample. While having a manageable workload (29%), having access to physical and technological resources (20%), working with students who are engaged with mathematics (36%), having good relationships with students (20%), and having a consistent school-wide student behaviour policy (18%) also featured prominently in this group, so did having high confidence in my own planning and teaching of mathematics lessons (29%), being able to teach mathematics adaptively, fulfilling students’ diverse needs (20%), and working with supportive parents/carers/families (20%). Unlike the English sample, these cover a much wider range of factors, speaking not only to professional but also to student, parental, and personal (i.e. knowledge and competence) factors.

5. Phase 2: Rating the centrality of teacher wellbeing factors

5.1 Participants

The Phase 2 sample comprised 137 teachers, 76 from England and 61 from Australia (some of whom also participated in Phase 1). Collectively, 33% of teachers identified as male, 66% as female, and 1% as unspecified or another gender. 35% were working in a primary school and 65% in a secondary school (summarised by country in Table 4). Years of teaching experience (yoe) included: $yoe \leq 5\text{yrs}$ (23% of combined sample), $5\text{yrs} < yoe \leq 11\text{yrs}$ (29%), $11\text{yrs} < yoe \leq 25\text{yrs}$ (37%), $25\text{yrs} < yoe$ (12%).

Table 4
Teachers in two countries by sectors in Phase 2

Teacher sector characteristics	En <i>n</i> (%)	Aust <i>n</i> (%)	Comb <i>n</i> (%)
Primary	26 (34)	25 (41)	51 (37)
Secondary	50 (66)	36 (44)	86 (63)
Total	76 (100)	61 (100)	137 (100)
Note. En = England; Aust = Australia; Comb = combined			

5.2 Procedure

The aim of Phase 2 was to establish the centrality of each of the 60 factors identified in Phase 1. Participants were provided with the full list of factors and asked to rate each one on an 11-point scale ranging from 0 (*not at all central to my wellbeing as a mathematics teacher*) to 10 (*extremely central to my wellbeing as a mathematics teacher*). This rating scale follows the prototype methodology established by

Rosch (1975) and adapted for wellbeing research by Jarden et al. (2018) and Vo et al. (2024).

Participants were given the following instructions:

Please read through this list and rate how central/important you think each characteristic is to the concept of your wellbeing as a mathematics teacher. You should do so by selecting a number between 0 (not at all central/important) and 10 (extremely central/important). Please ensure that you think about the concept of your wellbeing specifically in the context of you as a teacher of mathematics, rather than wellbeing as a teacher more broadly (i.e. across all subjects combined).

The collection of data in Phase 2 occurred between December 2024 and February 2025.

5.3 Analysis

Mean centrality ratings and standard deviations were calculated for each factor. To assess the internal consistency of participants' ratings, split-half reliability with Spearman-Brown correction and Cronbach's alpha were calculated for the combined sample and separately for each country, and also for primary and secondary sectors, both combined and within each country, and for different years of teaching experience. Independent samples *t*-tests were conducted to compare mean centrality ratings between English and Australian teachers for each of the 60 factors, between sectors and for different years of teaching experience. To control for Type I error inflation, due to multiple comparisons, a Bonferroni correction was applied ($\alpha = .05/60 = .0008$). Effect sizes were calculated using Cohen's *d*, with values of 0.2, 0.5, and 0.8 representing small, medium, and large effects, respectively (Cohen, 1988). Eight participants with incomplete demographic data were excluded from the independent samples *t*-tests using listwise deletion, leaving an analytic sample of $N = 129$ (England $n = 57$, Australia $n = 72$) for all country and sector comparisons.

5.4 Reliability

Reliability analyses demonstrated excellent internal consistency across all ratings. For the combined sample ($N = 137$), split-half reliability with Spearman-Brown correction was .943, and Cronbach's alpha was .912 for the first half and .925 for the second half of factors. English teachers' ratings showed similarly high reliability (Spearman-Brown = .97, Cronbach's $\alpha > .93$), as did Australian teachers' ratings (Spearman-Brown = .91, Cronbach's $\alpha > .90$). These values indicate highly consistent conceptualisations of wellbeing of teachers of mathematics collectively and within each country.

5.5 Findings

5.5.1 Overall Factor Centrality Ratings (RQ1)

Across the combined sample, all 60 factors received mean ratings above 5.0, with all but three rated above 7.0, indicating that teachers considered almost all of the factors to be at least moderately highly central to their wellbeing as mathematics teachers. The centrality of 33 factors was above 8, indicating that more than half of the factors were considered very central to the teachers' wellbeing (mean centrality ratings for all factors with $M > 8$ for the Combined sample are presented in Table 5; all factors'

centrality can be found in Appendix 2). Within these, the three factors rated as the most central to mathematics teacher wellbeing were: having a manageable workload ($M = 9.35$, $SD = 1.02$), having good relationships with students ($M = 9.03$, $SD = 1.16$) and being confident in teaching the mathematics curriculum ($M = 8.94$, $SD = 1.08$). These most central factors also showed relatively low standard deviations, indicating a high degree of consensus among teachers.

The three lowest-rated factors were: having a uniform way of teaching across the mathematics department ($M = 5.88$, $SD = 2.71$), working with students who have had good previous experiences with mathematics ($M = 6.22$, $SD = 2.41$), and having specialist support from inside and outside school ($M = 6.72$, $SD = 2.24$). These lowest-rated factors had substantially higher standard deviations, indicating greater variability in teachers' responses.

Table 5
Top 33 factors according to their Mean Centrality Ratings for the Combined sample

Factor	Combined <i>M (SD)</i>
Having a manageable workload	9.35 (1.02)
Having good relationships with students	9.03 (1.16)
Being confident in teaching the mathematics curriculum	8.94 (1.08)
Working with supportive and approachable colleagues	8.84 (1.18)
Having good mathematics subject content knowledge	8.82 (1.41)
Having autonomy and trust to experiment with my mathematics teaching	8.76 (1.29)
Having time to think about and plan mathematics lessons	8.75 (1.41)
Experiencing a sense of success in my mathematics teaching	8.74 (1.48)
Feeling valued and appreciated (by leadership, students, parents)	8.74 (1.29)
Having high confidence in my own planning and teaching of mathematics lessons	8.74 (1.22)
Being organised and feeling in control in relation to my mathematics teaching	8.69 (1.45)
Having the flexibility to manage my own time outside of taught lessons	8.61 (1.56)
As a teacher, having a good understanding of the mathematics curriculum	8.61 (1.40)
Having good relationships with colleagues	8.60 (1.28)
Being adaptable	8.59 (1.36)
Having good physical health / feeling well	8.58 (1.65)
Working with a mathematics curriculum which is fit for purpose	8.58 (1.64)

Factor	Combined <i>M (SD)</i>
Being patient and calm	8.56 (1.59)
Having strong leadership support	8.54 (1.51)
Having time to support students with their mathematics inside the school working hours	8.54 (1.65)
As a teacher, having love and passion for mathematics	8.52 (1.76)
Being able to teach mathematics adaptively, fulfilling students' diverse needs (i.e. adaptive teaching)	8.47 (1.51)
Having a consistent school-wide student behaviour policy	8.40 (1.87)
As a mathematics teacher, feeling respected by others	8.38 (1.60)
Being self-motivated in relation to my mathematics teaching	8.33 (1.66)
School's understanding of support for teachers' needs and mental health	8.32 (1.72)
Having resilience when teaching mathematics	8.30 (1.54)
Engaging my students in mathematical problem-solving	8.16 (1.63)
Having a decreased load of administrative tasks	8.16 (2.03)
Having opportunities to discuss mathematics teaching with colleagues	8.15 (1.81)
Being persistent in overcoming challenges when teaching mathematics	8.14 (1.68)
Embracing continuous professional learning and growth in relation to my mathematics teaching	8.12 (1.64)
Having time to reflect on my mathematics teaching	8.12 (1.77)

5.5.2 Country Comparisons (RQ2)

Three of the 60 factors showed statistically significant differences in centrality ratings between English and Australian teachers, all belonging to the professional factors theme and rated as more central by English teachers (shown in Table 6; all differences among all factors can be found in Appendix 2). These

were: having a bank of shared department/school worked examples and solutions to mathematical content (England: $M = 8.12$, $SD = 2.09$; Australia: $M = 6.78$, $SD = 2.18$; $t(127) = 3.55$, $p < .001$, $d = 0.63$); collaborating with colleagues when planning mathematics teaching (England: $M = 8.42$, $SD = 1.79$; Australia: $M = 6.47$, $SD = 2.44$; $t(127) = 5.04$, $p < .001$, $d = 0.89$); and having access to supportive and quality mentoring for mathematics teaching (England: $M = 8.12$, $SD = 1.81$; Australia: $M = 6.29$, $SD = 2.25$; $t(127) = 5.03$, $p < .001$, $d = 0.89$). English teachers demonstrated higher centrality ratings and smaller standard deviations across all three factors, indicating more consistent responses within the English sample. The remaining 57 factors showed no statistically significant differences between countries at the Bonferroni-corrected threshold, indicating broad cross-national agreement in teachers' factor centrality ratings.

Table 6
Statistically significant differences in Mean Centrality Ratings by Country

Factor	Combined <i>M (SD)</i>	En <i>M (SD)</i>	Aust <i>M (SD)</i>	<i>t</i>	<i>p</i>	<i>d</i>
Having a bank of shared department/school, worked examples and solutions to mathematical content*	7.37 (2.14)	8.12 (2.09)	6.78 (2.18)	3.55	< .001	0.63
Collaborating with colleagues when planning our/my mathematics teaching*	7.33 (2.18)	8.42 (1.74)	6.47 (2.47)	5.04	< .001	0.89
Having access to supportive and quality mentoring for my mathematics teaching*	7.10 (2.05)	8.12 (1.74)	6.29 (2.27)	5.03	< .001	0.89

Note. En = England; Aust = Australia; M = mean; SD = standard deviation; d = Cohen's d effect size.

$N = 129$ (England $n = 57$, Australia $n = 72$). Factors ordered by combined sample means (highest to lowest). * indicates significant difference at $p < .001$ (Bonferroni-corrected $\alpha = .05/60$).

5.5.3 Sector Comparisons (RQ3)

Among all factors, only two showed statistically significant differences between primary and secondary teachers across the country-combined sample (Primary $n = 47$, Secondary $n = 82$), both rated as more central by primary teachers (presented in Table 7; data for all factors' comparisons by sector can be found in Appendix 3). These were: being able to teach mathematics adaptively, fulfilling students' diverse needs (Primary: $M = 9.06$, $SD = 1.08$; Secondary: $M = 8.12$, $SD = 1.51$; $t(127) = 3.56$, $p < .001$, $d = 0.65$); and having a uniform way of teaching mathematics across the mathematics department (Primary: $M = 7.34$, $SD = 2.23$; Secondary: $M = 5.05$, $SD = 2.64$; $t(127) = 4.97$, $p < .001$, $d = 0.91$). Notably, while having a uniform way of teaching mathematics across the mathematics department had a high mean difference between primary and secondary ($DM = 2.29$), perhaps indicating a relative insignificance of this factor for the secondary teachers, the standard deviations for both primary and secondary for this factor were also

both high, suggesting a greater diversity in the responses from teachers in both groups. Importantly, however, this result appears to be influenced by the English sample, which we explain below.

The remaining 58 factors showed no statistically significant sector differences at the Bonferroni-corrected threshold.

Table 7
Statistically significant differences in Mean Centrality Ratings by Sector

Factor	Combined <i>M (SD)</i>	Primary <i>M (SD)</i>	Secondary <i>M (SD)</i>	<i>t</i>	<i>p</i>	<i>d</i>
Being able to teach mathematics adaptively, fulfilling students' diverse needs (i.e. adaptive teaching)*	8.47 (1.45)	9.06 (1.11)	8.12 (1.61)	3.56	< .001	0.65
Having a uniform way of teaching mathematics across the mathematics department*	5.88 (2.52)	7.34 (2.42)	5.05 (2.58)	4.97	< .001	0.91
Note. <i>M</i> = mean; <i>SD</i> = standard deviation; <i>d</i> = Cohen's <i>d</i> effect size.						

N = 129 (England *n* = 57, Australia *n* = 72. Factors ordered by combined sample means (highest to lowest). * indicates significant difference at $p < .001$ (Bonferroni-corrected $\alpha = .05/60$).

Country-by-Sector Comparisons

Examining sector differences within each country revealed divergent patterns. In Australia, no factors showed statistically significant sector differences at the Bonferroni-corrected threshold. In contrast, in England one factor showed a statistically significant difference between sectors (see Table 8): having a uniform way of teaching mathematics across the mathematics department (Primary: $M = 8.14$, $SD = 2.19$; Secondary: $M = 5.44$, $SD = 2.48$; $t(55) = 4.08$, $p < .001$, $d = 1.12$). This represents a large effect size (of mean difference $MD = 2.70$), with English primary teachers rating this factor substantially more centrally than their secondary colleagues. Mean centrality ratings for all factors by sector within each country can be found in Appendix 4.

Table 8

Statistically significant differences in Mean Centrality Ratings by Sector when controlled for country

Factor	Eng Prim <i>M</i> (<i>SD</i>)	Eng Sec <i>M</i> (<i>SD</i>)	Eng <i>t</i>	Eng <i>p</i>	Eng <i>d</i>	Aust Pri <i>M</i> (<i>SD</i>)	Aust Sec <i>M</i> (<i>SD</i>)	Aus <i>t</i>	Aust <i>p</i>	Aus <i>d</i>
Having a uniform way of teaching mathematics across the mathematics department*	8.14 (1.98)	5.44 (2.62)	4.08	< .001	1.12	6.69 (2.57)	4.74 (2.52)	3.13	0.003	0.77

Note. M = mean; SD = standard deviation; d = Cohen d effect size. *N* = 129 (England *n* = 57, Australia *n* = 72). Factors ordered to match Tables 1 and 2. * indicates significant difference in England at *p* < .001 (Bonferroni-corrected α = .05/60).

5.5.4 Years of experience Comparisons (RQ4)

Within the available sample of teachers across both countries, which included 31 teachers with yoe ≤ 5years and 106 teachers with yoe > 5years, no items showed a statistically significant difference at the Bonferroni-corrected threshold (see Appendix 5 for all factors' centrality analysis). For the Bonferroni-uncorrected comparisons, three items showed a statistically significant difference (Table 9).

Table 9

Bonferroni-uncorrected statistically significant differences in Mean Centrality Ratings by number of years of experience

Factor	≤ 5 yrs <i>M</i> (<i>SD</i>)	6 + yrs <i>M</i> (<i>SD</i>)	<i>t</i> (135)	<i>p</i>	<i>d</i>
Having good mathematics subject content knowledge	8.26 (1.88)	8.95 (1.18)	-2.49	0.014*	-0.51
Collaborating with colleagues when planning to teach mathematics	8.23 (2.28)	7.06 (2.37)	2.44	0.016*	0.50
Having access to supportive and quality mentoring for my mathematics teaching	8.03 (1.72)	6.86 (2.29)	2.64	0.009*	0.54

Note. Independent-samples t-tests, equal variances assumed, *df* = 135. *d* is Cohen's *d* (pooled SD). Bonferroni-adjusted α = .05/60 = .000833; no item reached this threshold. * *p* < .05 (uncorrected).

6. Discussion

6.1 Themes of wellbeing factors

Although the primary aim of prototype analysis was to establish factors centrality through Phase 2 ratings, the Phase 1 data offer a useful window into what teachers spontaneously associate with their wellbeing when asked openly. The patterns of self-generated factors are, perhaps, worth noting. The 32 factors nominated within the professional theme addressed workload and time, autonomy, feeling valued and respected, and collaborative and supportive working environments. The second largest theme, personal factors ($n = 19$), foregrounded personal characteristics alongside knowledge and competence. These patterns may reflect what teachers are currently finding most challenging, what factors they consider most central remain unaddressed, or, conversely, what they are experiencing as making a meaningful positive difference in their professional lives at the time of the study. Notably, the patterns broadly align with prominent research and professional narratives, which frequently report concerns about teacher workload (Brady & Wilson, 2021; Creagh et al., 2025; Morris et al., 2026), the erosion of professional autonomy through accountability pressures (Brady & Wilson, 2021; Ingram et al., 2026), as well as the importance of mathematics teacher knowledge and competence (Hill & Marschall, under review).

6.2 What matters most to mathematics teachers for their wellbeing

In Phase 2, all but three of the 60 factors were rated by teachers of mathematics as relatively central ($M > 7$), with an overwhelming 33 factors' centrality exceeding a mean of 8 ($M > 8$). These findings seem consistent with the Phase 1 data, in which teachers spontaneously generated a broad range of factors across professional and personal domains, foreshadowing the Phase 2 finding that virtually all of these factors were rated as central to their wellbeing in the context of teaching mathematics.

The three lowest rated factors were: having specialist support, working with students who have good previous experience with mathematics, and having a uniform way of teaching mathematics across the mathematics department. Considering a uniform way of teaching, the sector analysis revealed prominence of this factor among primary teachers, while being considered more or less neutral by secondary teachers (with $M = 5.44$, $SD = 2.62$). Consequently, we suspect that the large secondary teacher sample in Phase 2 (63%) might have skewed the combined low centrality of this factor in the combined sample.

The low centrality of students' past experiences with mathematics might reflect teachers' eagerness to work with students from diverse backgrounds and experiences. Previous research indicates that teachers draw great satisfaction from students' mathematical achievements (Martínez-Sierra et al., 2019, 2022), with teachers experiencing particular fulfilment when watching struggling students overcoming their mathematical difficulties and growing in mathematical confidence (Russo, Bobis, et al., 2023). It is possible that teachers draw fulfilment and happiness when students whose experiences might not have been entirely positive begin to thrive under the teachers' current care, making students' experiences with mathematics less significant for teachers' wellbeing.

The comparatively low rating for having specialist support is perhaps more surprising, particularly given the most recent UK Education Committee report (Hayes et al., 2025), which highlighted a systemic crisis

in which teachers report being stretched beyond capacity in attempting to meet the diverse needs of all students in their care. While there may be many explanations for this anomaly, we feel that this issue requires attention in later studies.

Of the 33 factors rated with $M > 8.00$ in Phase 2, all but two fell within the professional and personal themes. Focusing on the ten most central factors, as shown in Table 5, these factors cluster around three themes. Four belong to the personal factors theme, all within the knowledge and competence sub-theme, and reflect teachers' sense of subject knowledge, confidence in planning and teaching, and experiencing success in their teaching. Five belong to the professional factors theme: two address workload and time, specifically having a manageable workload (the highest rated factor overall) and having time to think about and plan mathematics lessons; two address autonomy and recognition, specifically having autonomy and trust to experiment with mathematics teaching and feeling valued and appreciated; and one reflects collegial relationships, namely working with supportive and approachable colleagues, which ranked fourth overall. The remaining factor, ranked second overall, belonged to the student factors theme and concerned the importance of good relationships with students, reflecting the extent to which students sit at the centre of mathematics teachers' professional lives.

The high centrality of factors related to workload and feeling valued and appreciated is consistent with broader research on teacher wellbeing and attrition (Creagh et al., 2025; Morris et al., 2026; Nwoko et al., 2023). The recent Teaching and Learning International Survey (TALIS 2024) from 55 countries reported that workload placed the greatest demands on teachers in their professional lives. The recent Tes Global Teacher Wellbeing Report 2026 (Tes, 2026), drawing on over 2,800 teachers worldwide, identified workload as the primary source of stress for 73% of respondents, with 63% working six or more hours beyond their contracted week, and 66% citing recognition and appreciation as a key area for improvement (Tes, 2026). Similarly, broader research on teacher status highlights the importance of professional recognition and societal appreciation for teacher retention and wellbeing (Yip et al., 2025).

The prominence of the personal theme cluster within the top ten factors, encompassing confidence in teaching mathematics, subject content knowledge, confidence in planning and teaching mathematics lessons, and a sense of success in teaching mathematics, is consistent with findings from the earlier scoping review (Hill & Marschall, under review), which identified subject knowledge and confidence as significant contributors to how teachers of mathematics feel and function in their professional lives—limited mathematical knowledge and confidence being associated with feelings of shame, anxiety, and stress, and strong subject knowledge associated with enjoyment and fulfilment (e.g. García González & Martínez Sierra, 2020; Jian et al., 2023). The prominence of knowledge and competence factors is also consistent with the argument that subject-specific confidence and capability occupy a distinctive place in mathematics teachers' professional lives (Hill & Marschall, under review).

The three clusters emerging from the top ten factors broadly mirror the picture from Phase 1: professional working conditions that support autonomy, collaboration, and recognition; subject-specific knowledge and competence; and relationships with students. Taken together, these clusters map loosely

onto the three basic psychological needs identified by self-determination theory, namely autonomy, competence, and relatedness (Ryan & Deci, 2017), demonstrating that these three needs function as important foundations of teacher wellbeing more broadly (Collie & Martin, 2017).

6.2.1 On subject specificity

Although knowledge and competence are important across subject areas, the scoping review findings raise the question of whether they carry particular weight in the context of mathematics teacher wellbeing (Marschall & Hill, 2026). As discussed earlier, public and policy narratives that frame mathematics in terms of fixed ability and procedural correctness appear to place distinctive pressures on teachers of mathematics. Within such a context, some teachers may feel anxious about modelling important aspects of mathematical thinking in front of students, such as learning from errors, engaging with productive struggle, and prioritising problem-solving processes over correct answers (García González & Martínez Sierra, 2020). After all, presenting any form of behaviour which might be perceived as weakness would place teachers in a stressful position. Where tensions between policy expectations and teachers' philosophical orientations towards mathematics and its pedagogy remain unresolved, there is reason to expect these struggles to continue (Marschall & Hill, 2026). If these tensions do exist, the prominence of knowledge and competence in our findings reported in this study may reflect something specific to mathematics teaching, with implications that warrant explicit attention at both school and policy levels.

It is notable that only two factors in this study related directly to pedagogy, and only one of these might be considered mathematics-specific: engaging students in mathematical problem-solving. This is consistent with the picture from the scoping review (Hill & Marschall, under review). Although this factor ranked 28th overall, its centrality rating was high with low variability ($M = 8.16$, $SD = 1.63$), indicating both its importance and a strong consensus across the sample. If this pedagogical factor is constrained or undermined by policy, mathematics teachers may be at heightened risk of undermining their wellbeing.

The high centrality of autonomy in mathematics teaching is also timely, given the current policy climate in both countries. Our earlier scoping review found that external systemic pressures, rigid pedagogical mandates, and constraints on professional decision-making were associated with feelings of stress, anxiety, and frustration among mathematics teachers (Hill & Marschall, under review). Importantly, however, this extended beyond a general lack of professional freedom to a more specific tension between teachers' conceptualisation of mathematics as a sense-making discipline and external pressures toward direct instruction and rote learning (Andrà et al., 2019; Jiang et al., 2021). Recent policy directions in both Australia and England have intensified this tension. In Australia, several states, such as Victoria and New South Wales, have mandated specific pedagogical practices (e.g. direct, explicit instruction) in mathematics, thereby reducing teachers' capacity to exercise professional judgement in how they teach (Sawatzki et al., 2025). Similar accountability and prescription pressures in England have been associated with teachers feeling less trusted and more controlled, with negative consequences for both teacher professional wellbeing (McQuade, 2024) and students' meaningful experiences of

mathematics as a problem-solving, reasoning and discussion-based discipline at the secondary level (Ingram et al., 2026). As Ingram and colleagues note, accountability systems can narrow both curriculum and pedagogy towards tested outcomes, a pressure that tends to shift teacher emphasis towards procedural content knowledge and fluency over reasoning “even when they see broader mathematical thinking, reasoning and disposition as more educationally important” (Ingram et al., 2026, p. 8).

This pressure to comply might come at a cost to mathematics teacher wellbeing. From a value fulfilment perspective (Tiberius, 2018), these policy directions prevent teachers from enacting what they value as good mathematics teaching, consequently threatening their wellbeing as mathematics teachers who become more anxious about the fact that they do not serve their students’ mathematics learning best (Charalambous & Philippou, 2010; Jiang et al., 2021). Previous research with secondary teachers in England emphasised the need to reduce contradictions in teachers’ professional lives in order to improve teacher wellbeing (McQuade, 2024). Considering this argument at a subject specificity level, the combination of this study and the recent review of literature (Marschall & Hill, 2026), suggest that, in order to improve wellbeing of mathematics teachers, we might need to focus on reducing the contradictions between narratives associated with mathematics and its effective teaching and learning at different institutional, societal and personal levels.

6.3 Cross-national comparison of factor centrality

The country comparison reveals a strong pattern of agreement in the factor centrality ratings between English and Australian teachers—57 out of the 60 factors showed no statistically significant differences in centrality ratings between the two samples, indicating that mathematics teachers in both countries agree about what matters most to their wellbeing in the subject. This cross-national consensus is consistent with the global picture emerging from recent teacher wellbeing research. The Tes Global Teacher Wellbeing Report 2026 identified workload, recognition, and relationships as the dominant themes shaping teacher wellbeing internationally (Tes, 2026), all of which feature prominently in the upper tier of our centrality data. These converging findings across very different methodologies and scales might suggest that the factors that teachers of mathematics consider most central to their wellbeing reflect systemic, global professional pressures.

Three factors that showed statistically significant country differences, all rated as more central by English than Australian teachers with medium-to-large effect sizes were: collaborating with colleagues when planning mathematics teaching, having a bank of shared departmental resources and worked examples, and having access to supportive, high-quality mentoring. Notably, all three relate to structured collaborative professional practice within the mathematics department or school. Tiberius (2018) emphasised that the things that we consider most important to our wellbeing are partly shaped by what we have had the opportunity to pursue and experience. We wonder whether this greater preoccupation of English teachers with professional factors might be highlighting how the profession in England is structured. Indeed, currently in England, the aforementioned structures of collaborative planning, sharing

of resources and good practice, and mentoring are becoming commonly embedded within the professional context of teachers of mathematics; e.g. it is not uncommon for many mathematics departments in English schools to have centrally shared banks of lesson plans and resources, or to have teacher mentoring schemes (mandated for all teachers in the first two years of teaching). It is possible that, if such schemes and ways of working are not prevalent in the Australian context, the high appreciation of these by English teachers might suggest that they could represent useful strategies for enhancing teacher wellbeing in Australia.

6.4 Sector comparison of factor centrality

The sector comparison revealed two statistically significant differences, both rated as more central by primary teachers with medium to large effect sizes: being able to teach mathematics adaptively, and having a uniform way of teaching mathematics across the mathematics department. Both factors may reflect a shared desire for consistent, structured practices among primary teachers who, unlike secondary mathematics specialists, are generalists required to teach mathematics alongside other curriculum areas. Secondary mathematics teachers typically develop more specialised mathematics subject knowledge and pedagogical repertoires through dedicated disciplinary training. Research consistently shows that primary teachers experience higher rates of mathematics anxiety than their secondary counterparts, particularly those without specialist mathematics training (e.g. Artemenko et al., 2021; Dove et al., 2021; Gok et al., 2023; Patkin & Greenstein, 2020). It is plausible that primary teachers rate adaptive teaching as more central to their wellbeing in the context of teaching mathematics, not because the challenge of diverse learners is unique to their setting, but because they may feel less equipped to navigate it, making it a more salient source of professional vulnerability. It is also possible, however, that the emphasis on the adaptive teaching among the primary teachers stems from the fact that these teachers spend every hour of their teaching different subjects to the same group of pupils and become much more attuned to their students' needs than their secondary colleagues. These exploratory conclusions require further exploration.

The higher centrality of a shared departmental approach to mathematics teaching among primary teachers may reflect a similar dynamic, in which common pedagogical frameworks provide professional reassurance and a sense of shared purpose that is particularly valued when subject-specific confidence requires support (Hill & Marschall, under review; Hurdle, 2020). Importantly, however, that when controlled for country, the statistically significant primary-secondary sector difference in this factor was evident only in the English sample. This high factor centrality among primary English teachers might reflect a well-established professional practice, in which every English primary school has an allocated Mathematics Subject Lead – a person responsible for school's mathematics teaching and learning, overseeing the school mathematics curriculum and supporting school staff with their mathematics teaching. Moreover, as Marks et al.'s (2023) report shows, there has been a recent shift in state-funded primary schools' use of centralised resources, with 90% of surveyed schools using a centralised school curriculum map taken from a mathematics scheme¹. Schools reported that the main rationale behind this choice is to ensure curricular coverage, progression and consistency across the school. Additionally,

70% of schools indicated that they continuously actively adapt their resources to suit their pupils' needs. The findings of this study, while reflecting this current reality, suggest that these strategies appear to be conducive to the primary teachers' wellbeing.

6.5 Level of experience comparison of factor centrality

Considering the significance of the first five years of teaching experience in the acute attrition of mathematics teachers, we also compared this group of teachers with their more experienced colleagues. In this comparison, however, no factors showed a statistically significant difference in centrality ratings between less- and more-experienced teachers. While this might indicate that there are no particularly significant wellbeing-related factors contributing to this early attrition, we attend to this interpretation with caution, due to a significantly lower sample size in this comparison.

Searching for potential avenues to explore, the uncorrected comparisons ($p < 0.05$) showed statistically significant differences for three items: having good mathematics subject content knowledge (rated higher by experienced colleagues), collaborating with colleagues when planning to teach mathematics, and having access to supportive and quality mentoring for my mathematics teaching (both rated higher by novice teachers). Perhaps, unsurprisingly, both items rated higher by less experienced teachers represent an aspect already widely recognised in the educational context, particularly in England, with mentoring mandated for all early career teachers. If we are to trust the uncorrected comparison, it is perhaps reassuring that the scheme is valued by English novice teachers, and could be considered as a strategy conducive to teacher wellbeing in Australia.

7. Limitations

While content with the exploratory aspect of the prototype approach, we also acknowledge its limitations. First, since wellbeing is a value-based concept (Tiberius, 2018), it arises "in part from the unique way that a person adjusts to their environment", making wellbeing potentially unique to individuals (Huang et al., 2022, p. 3). Yet, the prototype approach, focuses on the collective centrality of items whilst ignoring individual variation within populations. Similarly, while we provide tentative explanations for the observed patterns, we are cautious about over-interpreting these patterns. Whether teachers rate specific factors as more central than others because they find them more challenging, because they have more opportunities to fulfil them, or for other reasons, remains an open question. These limitations warrant further idiographic studies which focus on lived experiences of individual teachers. For example, rich interview studies might help reveal whether the patterns observed here reoccur and how they are experienced.

Secondly, the sample sizes in both phases, while comparable to those used in previous prototype studies (e.g. Vo et al., 2024), are modest, particularly for the country-by-sector and years of experience. Consequently, these findings in particular should be treated as exploratory. Future work with larger, more representative samples would allow for more robust comparisons and the examination of additional

variables, such as school type, out-of-field teachers, and socioeconomic context. While we paid attention to these variables in our analysis, the numbers representing each category were too small to explore their potential significance in the factor centrality ratings.

While Phase 2 data showed statistically significant differences of one factor between English primary and secondary mathematics teachers, there were, in fact, no English primary teachers taking part in Phase 1 of the study. Consequently, other significant factors relevant to this group may have been missing from the list of 60 factors.

Finally, while centrality ratings provide a valuable collective picture of what mathematics teachers find most important for their wellbeing, they capture a single point in time and cannot account for whether and how factor centrality shifts across career stages, school contexts, or in response to policy change. Longitudinal and context-sensitive designs would complement the findings reported here and move the field towards a more dynamic understanding of mathematics teacher wellbeing.

8. Conclusions

Teacher wellbeing has emerged as a critical concern across education systems worldwide, with poor wellbeing increasingly recognised as a driver of teacher attrition and workforce instability. Previous research emphasised that teacher “wellbeing support should be matched to the needs of recipients and support should increase teachers’ freedoms to act, rather than simply mitigating in the moment feelings of stress” (Manning et al., 2020, p. 75). Yet, efforts to understand and support mathematics teachers’ wellbeing have largely relied on generic wellbeing frameworks that are not designed to capture the distinctive nature of the experience of teaching mathematics. This study set out to address that gap by generating grounded findings about what primary and secondary teachers of mathematics in England and Australia consider most central to their wellbeing in the context of mathematics teaching, and by examining how this picture varies across school sectors and national contexts. The findings reveal patterns in factors of mathematics teacher wellbeing shared across both countries and sectors, with mathematics teachers’ knowledge and competence, alongside workload, relationships, autonomy, and recognition, among the most central factors. That this picture is consistent across England and Australia, and across primary and secondary settings, suggests that what mathematics teachers consider most important to their wellbeing is shaped substantially by the teacher subject identity and the nature of the work itself. Consequently, strategies seeking to ensure manageable workload, autonomy, and collegial support and collaboration should be considered as priority in addressing mathematics teacher wellbeing. Additionally, it appears crucial that mathematics teachers are equipped with strong subject knowledge. In cases where teachers report struggles with subject knowledge, departments and schools would benefit from ensuring that professional development and opportunities to collaborate around planning and teaching are high on institutional strategy agendas.

Where differences appear between countries and sectors, they may point to specific structural features of teachers’ professional contexts. They might also highlight potential support direction worth pursuing

in different contexts. For example, English primary mathematics teachers highly consider the aspect of consistency in teaching pedagogy across the school as central to their wellbeing, supported perhaps by the presence of subject leads within their schools. It is possible that Australian colleagues, who do not currently experience this professional structure, might benefit from its introduction.

The 60-factor list and centrality data reported here provide an empirical foundation for designing support that is grounded in what mathematics teachers themselves consider most important. Ultimately, since teacher wellbeing is closely linked to attrition (Hascher & Waber, 2021; TES, 2026), understanding what mathematics teachers consider most important for their wellbeing is inseparable from understanding how to sustain a profession that too many teachers are leaving too soon.

Declarations

This study has been approved by: the Office of Research Ethics and Integrity, University of Melbourne, Reference Numbers: 2024-28989-56335-5; 2024-28989-54983-4; 2024-28989-52498-3 Catholic Education Sandhurst Ltd in Australia: No ID number Department of Education Victoria, Application: ID 24-04-311 Faculty of Education Research Office, Cambridge University, Reference Number Ethics_012_2324

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Footnotes

1. A mathematics scheme is a “set of sequenced curriculum resources from one publisher/provider written to cover the full mathematics curriculum across the whole primary phase without the need for supplementation” (Marks et al., 2023, p. 7)

Figures

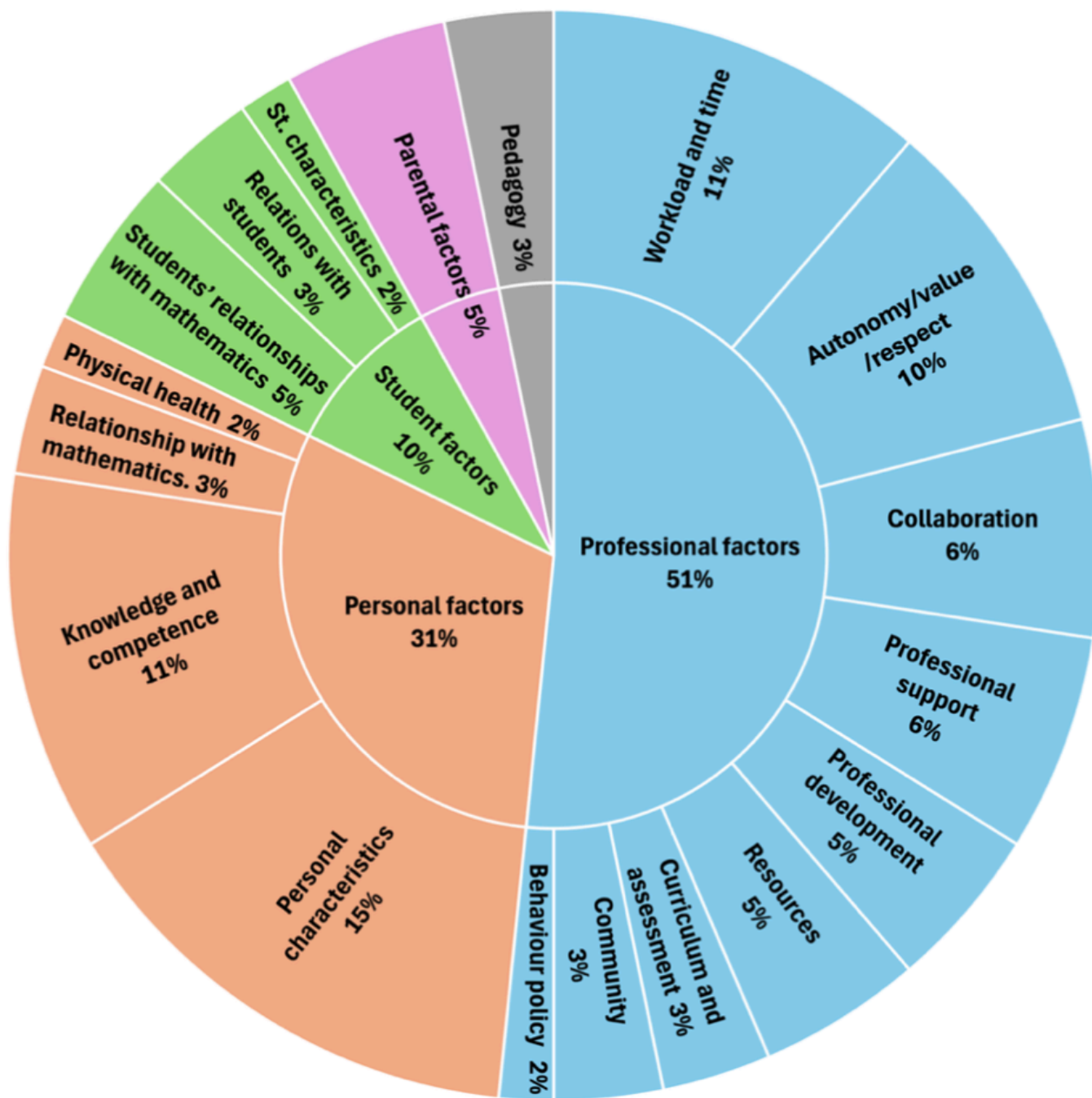


Figure 1

Themes and sub-themes encompassing all 60 factors (themes-inner circle, sub-themes outer circle)

Supplementary Files

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- [Appendices.pdf](#)