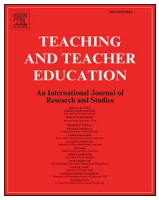
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Research paper



Connection, control, and competence: A career-stage perspective on teacher wellbeing

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ABSTRACT

Teacher wellbeing is increasingly recognised as essential for sustaining an effective and resilient education workforce. However, most school-based initiatives adopt a universal approach that overlooks how wellbeing needs may differ across career stages. This qualitative study aimed to identify which activities in-service teachers believe contribute to their wellbeing and compare these perceptions across early-, mid-, and late-career stages. Drawing on self-determination theory, which emphasises the psychological needs of autonomy, relatedness, and competence, the study analysed open-ended survey responses from 138 Australian primary and secondary teachers. Thematic analysis identified both shared and stage-specific wellbeing needs. While collegial support and workload management were important across all stages, early-career teachers prioritised social connection; mid-career teachers emphasised recognition and leadership support, while late-career teachers valued structured collaboration and professional contribution. These findings suggest that a one-size-fits-all approach may be inadequate and that career-stage-sensitive strategies are needed to support teacher wellbeing throughout the professional lifespan.

Teacher wellbeing is gaining increasing attention worldwide as educators, school leaders, and other educational stakeholders recognise its vital role in sustaining a strong and effective teaching workforce (Dreer, 2023; Fox et al., 2023; Hascher & Waber, 2021; Zhou et al., 2024). Wellbeing influences not only teachers' personal and professional fulfillment but also system-wide outcomes, including teacher retention and students' academic achievement (Dreer, 2023; Granziera et al., 2023; Lummis et al., 2022; Zhou et al., 2024). Teachers who experience high levels of wellbeing at work are professionally engaged, effective in their work, and more likely to remain in the profession (Collie, 2023a; Turner et al., 2021). Conversely, poor teacher wellbeing has been linked to stress, burnout, and attrition, contributing to ongoing teacher shortages that challenge educational systems worldwide (Carroll et al., 2022; UNESCO, 2022).

Acknowledging the wide-reaching outcomes of teacher wellbeing, schools around the world, including in Australia, have implemented various initiatives and practices to support teachers (Berger et al., 2022; Hascher & Waber, 2021; Hwang, Noh, et al., 2019; Lummis et al., 2022). These range from mindfulness and stress management programs to activities that promote self-care and resilience alongside efforts to enhance school culture. While these efforts recognise the importance of teacher wellbeing, they frequently adopt a universal approach that may overlook the distinct ways teachers at different career stages perceive and experience school-based wellbeing activities.

Increasingly, researchers recognise that wellbeing is contextually dependent, suggesting that initiatives must respond to the diverse and evolving needs of the teaching workforce (Hamling et al., 2020; Hine et al., 2022; Lomas et al., 2020). Therefore, understanding wellbeing through the lens of teachers' career progression is essential for developing targeted supports that address the specific challenges teachers face at different stages of their professional journeys. For example, early-career teachers navigating classroom management challenges and workload demands may require different support compared to mid-career teachers balancing leadership responsibilities and career advancement pressures (Woodcock & Reupert, 2024). Similarly, experienced teachers in late-career stages may face unique challenges related

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to emotional sustainability and adapting to ongoing policy reforms. Therefore, a comprehensive understanding of teachers' perceptions and experiences of their wellbeing is needed to ensure that policies, school-based initiatives, and practices are relevant, effective, and tailored to teachers' professional contexts.

This study explores whether and how Australian teachers' perceptions of their wellbeing vary across different career stages. Specifically, it aims to identify the school-based activities that in-service teachers believe support their wellbeing and compare how these perceptions may differ, if at all, among early-, mid-, and late-career teachers. Understanding potential differences may inform targeted and effective wellbeing strategies for teachers at various stages of their professional journey.

1. Teacher wellbeing

Even though scholars have employed a range of approaches to conceptualise teacher wellbeing, there is general agreement that it comprises multiple interrelated components (Hascher & Waber, 2021; McCallum et al., 2017; Viac & Fraser, 2020). Some conceptualisations emphasise individual factors, such as teachers' personal characteristics and psychological resources (e.g., emotional exhaustion and work enthusiasm, see Aldrup et al., 2018; eight psychological characteristics, see Bardach et al., 2022; the PERMA wellbeing model, see Billett et al., 2022). Others focus more directly on workplace experiences, highlighting the specific role of school connectedness, relationships with students and colleagues, and workload in shaping teachers' wellbeing (e.g., Collie et al., 2015; Renshaw et al., 2015).

In the current study, teacher wellbeing refers to teachers' healthy and effective functioning in their work environments (Collie & Martin, 2023; Huppert & So, 2013). This conceptualisation recognises that wellbeing is not solely an individual attribute but is strongly influenced by the work environment context (Hine et al., 2022; McCallum, 2021). This definition aligns directly with the study's focus on school-based activities that support teacher wellbeing, while offering sufficient breadth to encompass a range of wellbeing-promoting practices. Its previous use in Australian research further reinforces its suitability for the present study (Collie & Martin, 2023).

Teacher wellbeing has been consistently linked to a range of outcomes that affect individual teachers' effectiveness and students' educational experiences (Bardach et al., 2022; Collie et al., 2021; Granziera et al., 2023). At the individual level, enhanced teacher wellbeing is associated with increased self-efficacy (Huang et al., 2019; Zhang et al., 2023), increased job satisfaction (Capone & Petrillo, 2020; Dreer, 2021), and strengthened resilience (Brouskeli et al., 2018; Burić et al., 2019). These personal outcomes extend to interpersonal dimensions, fostering improved relationships with both students and colleagues (Aldrup et al., 2018; Spilt et al., 2011).

Teacher wellbeing is also associated with strong instructional effectiveness (Bardach et al., 2022), enhanced teaching performance (Chen & Chi-Kin Lee, 2022), and few student-rated behaviour problems (Aldrup et al., 2018). Furthermore, school-level analyses have found that collective teacher wellbeing, which refers to the shared responsibility, mutual support, and experience of wellbeing by a group of teachers (Liu et al., 2018), is related to student achievement (Collie et al., 2021; Granziera et al., 2023). For example, Collie et al. (2021) found that students were more likely to report receiving higher levels of instructional support and achieved stronger results in reading, mathematics, and science in schools when teachers experienced supportive working conditions, such as positive collaboration and opportunities for input into school decision-making. In contrast, a multilevel analysis by Granzier et al. (2023) found that higher levels of teacher emotional exhaustion at the school level were associated with lower average student achievement in numeracy and literacy. Together, these findings highlight the important impacts of teacher wellbeing on students' learning experiences and academic outcomes.

Importantly, given the persistent challenges of teacher shortages and attrition in educational systems across the globe (UNESCO, 2022), teacher wellbeing has been associated with teachers' intentions to stay in the profession (Arnold & Rahimi, 2025; Bardach et al., 2022). Analysing survey data from 744 primary and secondary teachers working in government schools, researchers investigated those factors linked to Australian teachers' intention to leave or remain in their jobs (Arnold & Rahimi, 2025). They found that teachers who felt committed to their school, experienced job satisfaction, and found meaning and purpose in their work were less likely to want to leave. Teachers were more likely to want to leave if they felt emotionally drained, struggled to balance work and family life, experienced violence at work, felt overloaded with work, and experienced high levels of stress and depressive symptoms (Arnold & Rahimi, 2025). These findings highlight the critical role of teacher wellbeing in supporting individual teachers, promoting workforce stability, and sustaining the overall effectiveness of the education system.

2. School initiatives and practices to support teacher wellbeing

In light of substantial studies documenting the extensive benefits of teacher wellbeing (Acton & Glasgow, 2015; Dreer, 2023; McCallum et al., 2017; Zhou et al., 2024), schools and policymakers are increasingly interested in initiatives and practices to address workplace challenges and support teachers' wellbeing (Berger et al., 2022; Viac & Fraser, 2020; Vo & Allen, 2022). Among these, professional development programs have been a prominent approach, focusing on enhancing teachers' psychological coping strategies, resilience, and wellbeing literacy (Berger et al., 2022; Vo & Allen, 2022).

School-based professional development programs predominantly focus on equipping individual teachers with the knowledge and strategies to support their psychological and emotional wellbeing, and professional resilience (Tarrasch et al., 2020; Taylor, 2018; Wessels & Wood, 2019). Designed to cater to all teaching staff members, these initiatives are delivered face-to-face by professional instructors and often involve mindfulness-based approaches aimed at helping teachers manage stress, enhance emotional awareness, and develop emotional regulation in the classroom (Frank et al., 2015; Hwang, Goldstein, et al., 2019; Vo & Allen, 2022). Other programs build teachers' resilience by fostering a growth mindset and teaching cognitive reframing techniques (Fernandes et al., 2019; Kangas-Dick & O'Shaughnessy, 2020). Some initiatives also incorporate training in positive psychology practices, such as gratitude, encouraging teachers to leverage their strengths (Critchley & Gibbs, 2012; Taylor, 2018). Other school-based initiatives focus on mental health awareness to support teacher wellbeing, equipping teachers with the knowledge and skills to recognise and respond to mental health challenges in themselves and their students (Berger et al., 2022). While these programs have been associated with positive outcomes, reducing teacher stress and negative emotions, they are primarily designed for general application, often overlooking varying teacher needs across the teaching workforce. This highlights a broad trend in teacher wellbeing initiatives and practices where support is often designed to be universally applicable (Hwang, Goldstein, et al., 2019; Schussler et al., 2018; Taylor, 2018).

Whilst many wellbeing initiatives focus on individual coping strategies (e.g., Critchley & Gibbs, 2012; Hwang, Goldstein, et al., 2019), others take a broader systems approach by targeting the organisational environment (Lummis et al., 2022; Morris et al., 2020; Naghieh et al., 2015). Organisational initiatives refer to strategic approaches that modify the psychosocial work environment by reshaping organisational elements such as institutional policies, operational processes, workplace culture, and professional roles (Naghieh et al., 2015). These initiatives often adopt broad, general strategies designed to reach teaching staff rather than tailoring support to the specific needs of different teacher cohorts. For example, one initiative in an Australian secondary school introduced targeted strategies to improve professional growth, professional interaction, and role clarity, three areas identified as key to

organisational health (Lummis et al., 2022). The implementation of these whole-school initiatives led to increased professional collaboration, enhanced communication between leadership and staff, and opportunities for professional growth (Lummis et al., 2022). Such findings suggest that organisational approaches can have a meaningful impact on school-wide teacher wellbeing by fostering a supportive professional culture. However, the extent to which they address varying teacher needs remain unclear.

In summary, recognising the important outcomes of teacher wellbeing, considerable research has focused on developing initiatives and practices to support teachers at work, addressing their needs at both individual and organisational levels (Lummis et al., 2022; Morris et al., 2020; Tarrasch et al., 2020; Taylor, 2018). However, these initiatives often apply a universal approach, treating teachers as a homogenous group rather than recognising potentially different wellbeing needs across different career stages. As a result, there is growing recognition that a one-size-fits-all approach may overlook the varied challenges teachers face throughout their careers. Researchers suggest that for wellbeing initiatives to be most effective, they must be responsive to teachers' specific experiences, contexts, and professional trajectories (Corbett et al., 2025; Dreer & Gouasé, 2021; Hamling et al., 2020). Without such differentiation, initiatives may fail to address the challenges and priorities that shape wellbeing at different points in a teacher's career, limiting their long-term impact. Therefore, understanding how teachers' professional experiences shape their perceptions of wellbeing-supportive activities across career stages is essential for designing initiatives and practices that provide meaningful support.

3. Challenges and supports across career stages

Teachers face evolving challenges throughout their careers, highlighting the need for a multifaceted approach to understanding and supporting teacher wellbeing (Day & Gu, 2010; Huberman, 1989; Woodcock & Reupert, 2024). Definitions of early-career teachers vary across the literature and policy context, with some frameworks defining early-career teachers as those within their first two years of practice (AITSL, 2023a), while others extend this period to the first five years of teaching (Coppe et al., 2024; Paniagua & Sanchez-Marti, 2018), which is the definition adopted in this study. Early-career teachers are widely recognised as encountering significant stressors that contribute to high attrition rates (Admiraal et al., 2023; AEU, 2023; UNESCO, 2023). Exploring these challenges in-depth, Black et al. (2023) conducted semi-structured interviews with 23 early-career Australian primary teachers in their second, third, and fourth years of teaching and identified three common challenges across: difficult interactions with parents, excessive workload (including administrative tasks and extracurricular responsibilities), and struggles with classroom management. They also highlighted cohort-specific concerns. While second-year teachers' challenges centred around adapting to workload and work-life balance, third-year teachers grappled with feelings of loneliness. Fourth-year teachers expressed concerns about leadership support and school climate (Black et al., 2023). These findings are significant to the current study because they highlight the dynamic and evolving nature of teachers' challenges, even within specific cohorts at the same career stage, which may influence teachers' wellbeing in differing ways.

The mid-career phase, which has been described as a "career crossroad" (Lusty, 2013, p. 88), presents both opportunities for growth and significant challenges. With 6 to 19 years of experience (Lusty, 2013), teachers at this stage often experience increased motivation and professional growth, but also face increased workload, limited recognition, and leadership concerns (Lusty, 2013). Despite their expertise, many mid-career teachers struggle with a lack of tailored professional development and often feel undervalued, particularly those who are not pursuing leadership roles (Booth et al., 2021). Work-life balance challenges, especially those with family commitments, further compound difficulties, impacting retention and long-term professional engagement.

Research into the experiences of late-career teachers is relatively limited compared to that of early- and mid-career teachers (Kwee, 2020). However, existing literature highlights several key issues. Van der Want et al. (2018) found that over time, teacher-parent interactions and non-teaching tasks became increasingly demanding while persistent challenges of balancing private life and work continued from early career. Additionally, the pressure of accountability and performance monitoring contributed to reduced autonomy, which in turn impacted teacher wellbeing and motivation (van der Want et al., 2018). Such findings shed light on the shifting nature of teachers' challenges across career stages, reinforcing the need for targeted initiatives and practices that address potentially evolving wellbeing needs.

Existing school-based initiatives and practices to support teachers vary across career stages, addressing distinct challenges and professional needs. For early-career teachers, mentoring and induction programs offer emotional, pedagogical, and administrative support, enabling them to navigate classroom management, parent interactions, and school culture effectively (Squires, 2019). Professional learning communities (PLCs) and targeted professional development further enhance skill development, while workload management strategies, such as reduced teaching loads and structured planning time, help mitigate stress (Admiraal et al., 2023). Mid-career teachers may benefit from specialist teaching roles and leadership development programs, offering alternative career pathways beyond administration (Booth et al., 2021). For late-career teachers, initiatives and practices focus on reducing administrative burdens, maintaining professional autonomy, and supporting work-life balance to sustain engagement and job satisfaction (Veliz & Mainsbridge, 2024).

While various career-stage support mechanisms, such as those described above, aim to enhance retention and professional growth, they are not explicitly designed with teacher wellbeing as a core focus. Existing research primarily evaluates these initiatives in terms of career progression and teacher effectiveness, with limited attention to their perceived impact on wellbeing. Moreover, little comparative research examines how teachers perceive school-based activities as contributing to their wellbeing across different career stages, particularly within the Australian context. This gap highlights the need for a teacher-informed approach to understanding and supporting wellbeing throughout the professional lifespan.

4. Theoretical framework

The theoretical framework guiding this study is self-determination theory (Deci & Ryan, 1985), which posits that human motivation and wellbeing are driven by the fulfilment of three fundamental psychological needs: autonomy (the ability to act with self-direction and choice), competence (a sense of mastery and effectiveness), and relatedness (meaningful connection with others). When these needs are met, individuals experience enhanced intrinsic motivation and overall wellbeing; when they are not, motivation and wellbeing decline. In education, this theory has been applied to understand teachers' motivation, turnover intentions, and professional learning (Collie, 2023b; Perlman, 2013; Power & Goodnough, 2019). Furthermore, research has repeatedly shown the importance of teachers having control over their practice, opportunities for skill development, and strong relationships with colleagues, leaders, and students (Allen et al., 2021; Harris et al., 2013; Orakci & Durnali, 2023; Owen, 2016; Pogere et al., 2019).

Self-determination theory (Deci & Ryan, 1985) provides a useful lens for examining shifts in teacher wellbeing across career stages. For instance, early-career teachers may struggle with competence, while mid-career teachers may require greater autonomy and progression but face constraints (Bilton, 2023; Black et al., 2023). Late-career teachers may seek to sustain professional relevance and competence while navigating ongoing policy and educational change (Brouhier et al., 2026). This study uses self-determination theory to explore how

schools-based activities are perceived to support teachers' wellbeing at different stages, focusing on the extent to which these activities fulfil their needs for autonomy, competence, and relatedness. The theory informed both the data analysis and the interpretation of findings.

5. The current study

Despite increasing recognition of teacher wellbeing as a critical factor in education, most school-based initiatives and practices are designed for teachers as a general group, with limited attention to how wellbeing needs may differ across career stages. Research has primarily focused on early-career challenges and retention (Admiraal et al., 2023; Black et al., 2023; Buchanan et al., 2013), leaving the wellbeing experiences of mid- and late-career teachers relatively underexplored. Although various career-stage initiatives exist, these are typically framed around workforce issues, such as professional development (Admiraal et al., 2023; Cawte, 2020; Pattie, 2009), rather than explicitly addressing teacher wellbeing. Furthermore, little is known about how teachers across different career stages perceive school-based activities as contributing to their wellbeing, particularly within the Australian context.

This study addressed this gap by exploring how in-service teachers at different career stages in Australia perceive school-based activities that support their wellbeing. It aims to identify which activities teachers believe contribute to their wellbeing and compare these perceptions across early-, mid-, and late-career stages. By examining these perspectives, this exploratory study aims to inform targeted, stage-specific approaches, supporting teacher wellbeing throughout the professional lifespan. The research question guiding the study is:

What school-based activities do in-service teachers perceive as contributing to their wellbeing, and how might these perceptions vary across career stages (early-, mid-, and late-career)?

6. Method

6.1. Research design overview

This study is situated in a constructivist-interpretivist paradigm (Schwandt, 1998), recognising that teacher wellbeing is shaped by individual experiences and social influences. From a constructivist perspective, we assumed that wellbeing is actively constructed through teachers' experiences, career-stage challenges, and interactions with their professional environment. Through an interpretivist lens we acknowledged that these perceptions are context-dependent and influenced by school culture, policies, and professional relationships.

This qualitative study provides an initial, exploratory examination of how Australian teachers across career stages perceive school-based activities that support their work-related wellbeing. The analysis draws on open-ended questionnaire responses collected from teachers across various school settings. Ethics approval for the study was granted by the Monash University Human Ethics Research Committee (project 34897).

6.2. Study participants

To be eligible, participants were required to be currently employed as primary or secondary teachers in Australia. Although 161 survey responses were received, 23 were incomplete, leaving a total of 138 participants. Most participants identified as women (81.82%) and worked in secondary (70.55%) Government school settings (64.79%). The sample reflected a broad range of teaching experience, with a relatively even distribution across career stages that aligns closely with national workforce data (see Table 1). For instance, 16% of participants in this study were early-career teachers (within their first five years), compared to 14% reported by the Australian Institute for Teaching and School Leadership (2023b). Additionally, 32% had 10–19 years of experience (broadly comparable to 27% nationally), and 23.24% had 21 or more years of experience, aligning with the 20% of teachers in the 20–29-year range reported in the national data (AITSL, 2023b). One discrepancy arises in the mid-career range: while 12% of teachers nationally reported 6–9 years of experience, 28.7% of participants in this study fell within a slightly broader range of 6–10 years, indicating a possible overrepresentation in this category. Nonetheless, despite some variability, the sample is aligned with national data and thus provides a credible reflection of the Australian teaching workforce across career stages.

Table 1
Participant demographics.

Field	Category	Percentage of participants ($n = 138$)
Gender	Woman	81.82
	Man	16.78
	Non-binary/gender diverse	0.70
Age	Under 30 years	13.29
	30-39 years	27.97
	40-49	31.47
	Over 50	27.27
Ethnic background	Aboriginal or Torres Strait Islander	0.70
	African	0.00
	Asian – Eastern	4.23
	Asian – Indian	2.11
	Asian – South-eastern	7.04
	Caucasian	72.54
	Hispanic	0.00
	Middle eastern	0.00
	Mixed race	3.52
	Other	7.75
	Prefer not to say	2.11
Place of work	Primary	29.45
	Secondary	70.55
School sector	Catholic	11.97
	Government	64.79
	Independent	23.24
Employment status	Full-time	59.78
	Part-time	13.97
	Permanent/ongoing	19.55
	Contract/temporary	6.70
Teaching experience	0-5 years	16.20
	6-10 years	28.17
	11-15 years	19.01
	16-20 years	13.38
	21 years and over	23.24

6.3. Participant recruitment and data collection

The present exploratory study draws on data from a broader national survey investigating teacher wellbeing in Australian schools. While the larger project explored teachers' conceptualisations of wellbeing (seeVo et al., 2024), the open-ended question analysed in this paper was outside the scope of the original study and had not previously been examined. The present paper therefore focuses specifically on teachers' responses to this question to explore potential differences in wellbeing-supporting practices at work across career stages.

Recruitment was conducted through social media platforms (Facebook, Instagram, LinkedIn) and the personal and professional networks of the research team. Participants were encouraged to share the study within their networks. These strategies reflect non-probability sampling methods aimed at maximising reach and accessibility while capturing diverse teaching experiences.

Data were collected via an online Qualtrics questionnaire, which asked participants to provide demographic information and respond to an open-ended question: *In your opinion, what specific activities or tasks at work currently contribute to your wellbeing? Please feel free to list as many as you like*. The open-ended question format provided a "wide-angle lens" that enabled the representation of multiple perspectives, making it a

practical and methodologically sound choice for investigating teachers' perceptions of wellbeing practices in schools (Braun et al., 2021, p. 643). Data were collected between August and October 2022. Participants provided informed consent before proceeding with the survey.

6.4. Data analysis

Similar to Coppe et al.'s (2024) teacher career stages, early-career teachers were categorised as having 1-5 years of experience ($n = 23$) in the current study. Mid-career teachers were categorised as having 6-15 years of experience ($n = 65$), while late-career teachers had more than 16 years of experience ($n = 50$) (Coppe et al., 2024). These categories create a distinct separation between different phases of a teaching career.

Data were analysed using Braun and Clarke's (Braun & Clarke, 2006, 2019) six-phase approach to reflexive thematic analysis, a method well-suited to exploring subjective experience and researcher interpretation. The first author conducted an inductive analysis, beginning with familiarisation with the data (step 1). Similar words and phrases were then grouped together by meaning for each career stage, with developing codes often evolving into candidate themes (step 2). The unit of analysis was individual meaning units within participants' written responses, with responses often containing multiple ideas relevant to teacher wellbeing. For example, "having time to collaborate with colleagues, having time in the classroom to build rapport and do fun activities" was coded as time, team-based collaboration, and relationships with students. Themes were not determined solely by frequency counts, but by patterns of shared meaning and the interpretative significance of concepts across responses within and across career stages, consistent with reflexive thematic analysis (Braun & Clarke, 2019).

As new responses were reviewed, they were added to existing groupings or used to generate new ones. These evolving themes were then reviewed, refined, and checked against the broader dataset to ensure coherence and distinctiveness (steps 3 and 4). Coding and theme development were influenced by the first author's background and perspective, acknowledging the subjective and interpretative nature of the analysis (Buetow, 2019). During this process, related codes were iteratively collapsed into broader conceptual groupings, resulting in the final themes presented in the Appendix. The prominence of themes was determined through the recurrence, depth, and interpretative relevance of ideas across the dataset rather than through quantification alone.

While an inductive approach was initially used to generate themes from the data, a deductive lens was subsequently applied to structure and deepen the interpretation of these themes through the framework of self-determination theory (Deci & Ryan, 1985); specifically, its core psychological needs in relation to relatedness, autonomy, and competence. This two-phase analytical process ensured that the analysis remained grounded in participants' experiences while allowing for a theoretically informed interpretation that provided explanatory depth. Significantly, applying self-determination theory post hoc did not constrain the coding process, but instead enhanced the coherence and relevance of the findings within a well-established psychological framework.

To support reflexivity and enhance the clarity of the coding framework, a second coder (the third author) reviewed the coding. Using the emergent themes generated through the inductive analysis by the first author, the third author independently applied the coding framework to a randomly selected 25% of the dataset across all career stages, as suggested by O'Connor and Joffe (2020). This process supported reflective dialogue amongst the research team and contributed to the coherence, transparency, and refinement of the analysis. The focus was not on achieving a consensus between the coders, but instead on deepening interpretative insight (Braun & Clarke, 2019; Buetow, 2019)

In the final phases (steps 5 and 6), all authors contributed to refining the themes and developing a coherent narrative that reflected the data in relation to the research question. Illustrative quotes were selected for each theme. While the primary focus of the analysis was on career stage, participants' place of work (i.e., primary and/or secondary school setting) was also considered. Following initial coding and theme generation, the data were revisited with place of work in mind to explore whether particular experiences or perspectives were prominent within specific career stages. Where relevant, notable differences or patterns are highlighted to illustrate variation across the sample. However, given the relatively larger distribution of participants working in secondary schools, these observations are intended to offer insight rather than generalisable claims. All coding was documented using Microsoft Excel.

7. Results

Findings indicated that participants' perceptions of school-based activities supporting their wellbeing varied across career stages, reflecting how their priorities and needs evolved throughout their teaching careers. While all themes aligned with the core psychological needs outlined in self-determination theory (SDT) (Deci & Ryan, 1985), the emphasis on each domain – relatedness, autonomy, and competence – varied with career progression. Table 2 summarises the four key themes that participants identified as contributing to their wellbeing at work at each career stage. These themes were generated based on the emphasis placed in their responses across the dataset. This emphasis was reflected not only in the frequency with which certain topics appeared, but also in the depth and detail with which participants described particular experiences (See Appendix 1 for the full set of themes identified for each career stage.).

7.1. Early-career themes

Early-career participants consistently emphasised the importance of activities that foster a sense of relatedness as key contributors to their wellbeing. Collegial support, professional relationships, and informal social activities, such as "staff functions," "drinks night," and "morning tea", were especially prominent in their responses. Feeling connected and supported by colleagues emerged as an important recurring theme, with one participant noting, "my conversations with other teachers help a lot," and another highlighting the value of informal connection, sharing, "doing activities with others in a teaching team that are fun." In addition to collegiality, student interaction featured strongly, with participants describing the fulfilment they experienced from positive relationships with students. This was especially common among participants working in secondary schools, with one noting the joy of "chatting to the students about what they are looking forward to on the weekend and seeing them light up."

Among the key wellbeing themes identified by early-career participants, the only one associated with autonomy was the ability to manage workload, time, and planning. Structured support, such as flexible planning time, was identified as particularly helpful in managing these demands. This theme was especially prominent among participants working in secondary schools, who often highlighted the importance of having time to organise and respond to their specific workload. Overall, the findings suggest that for early-career participants, wellbeing is most strongly supported by opportunities for connection, especially with colleagues and students, and by practical structures that help manage the demands of teaching.

7.2. Mid-career themes

For mid-career participants, wellbeing was most strongly associated with activities that supported relatedness and autonomy. Social activities and the ability to manage workload, time, and planning emerged as relatively more important for this group, compared to other career stages. Social events were seen as a means of sustaining staff morale and fostering connection. Participants highlighted the importance of having "time to connect with colleagues on a personal level not just

Table 2
Theme Prominence Across Each Career Stage
Note. The shading represents the relative strength of each key theme within the respective career stage. Light grey = lower relative strength among the most prominent four themes; Dark grey = higher relative strength among the most prominent four themes; and White = not featured in the most prominent four themes. SDT = Self-Determination Theory.

SDT	RELATEDNESS					AUTONOMY	COMPETENCE
THEME	Collegial support & relationships	Social activities	Team-based collaboration	Student interaction	Leadership support	Managing workload, time & planning	Teaching practice & professional development
EARLY							
MID							
LATE							

professional," while others described the impact of a "social club [that] does some fun activities to boost morale."

The ability to manage workload, time, and planning also featured strongly, reflecting a need for autonomy and practical flexibility. Participants described the value of having control over their schedules, with one noting the benefit of "time away from face-to-face teaching to properly plan and organise." Similarly, others emphasised the role of "planning time" and "flexibility of work hours when required" in supporting their wellbeing.

While collegial support remained important, support from leadership was also highly valued. This was particularly noted by participants working in secondary schools, who pointed to the role of school leaders in fostering a supportive culture. One participant highlighted "supportive leadership who check-in on people," while another described how "our principals do make sure to thank us for extra efforts through morning teas and emails."

Notably, the theme of feeling appreciated, recognised, valued, and respected emerged with greater detail and nuance in the responses of mid-career (and later-career) participants. One participant commented that "recognition from management in word and action" enhanced their wellbeing, while another valued "special events like acknowledgement of contribution with rewards." This theme was not emphasised in early-career participants' responses.

Taken together, the findings suggest that mid-career participants described wellbeing in ways that reflected a nuanced balance between relational connection and professional autonomy. Their responses highlighted the importance of support in managing workload, alongside opportunities for meaningful interactions with colleagues and school leaders.

7.3. Late-career themes

For late-career participants, perceptions of wellbeing were shaped by a combination of relatedness, autonomy, and competence. A central theme in this group's accounts was team-based collaboration. Participants described the value of working alongside experienced colleagues in supportive and coordinated ways as a key aspect of their wellbeing; for example, "working with (some) knowledgeable and passionate colleagues and school leaders," and "coming up with new ideas when collaborating with colleagues."

The ability to manage workload, time, and planning also emerged as a significant theme, however late career participants also emphasised the need for structural supports. Among those working in secondary schools, there was a noticeable shift from simply managing demands to valuing time for professional reflection. One participant noted the benefit of "specific initiatives to reduce administrative workload and provide teachers time to do their job," while another highlighted the importance of "having time to review and reflect on what I am currently doing."

Themes related to competence were more often expressed with greater depth and detail among late-career participants, suggesting a shifting emphasis on expertise, legacy and continued professional contribution compared to teachers in earlier career stages. Participants described wellbeing as enhanced by ongoing enjoyment of teaching practice and the opportunity to contribute to the development of others. For example, one noted the positive impact of "mentoring a Year 12 student," while another valued "constructive PL [professional learning] meetings where there is a valued understanding and positive outcome."

Overall, late-career participants viewed their wellbeing as closely tied to collaborative professional relationships, the autonomy to reflect and plan, and ongoing engagement in purposeful, fulfilling work. Their responses conveyed a strong sense of professional identity and a continued commitment to making a meaningful contribution.

8. Discussion

This exploratory study provides an initial examination of how Australian teachers across different career stages perceive school-based activities that support their wellbeing at work. Drawing on self-determination theory (Deci & Ryan, 1985, 2012), the analysis explored how the core psychological needs of relatedness, autonomy, and competence were experienced and prioritised by early-, mid-, and late-career teachers. The findings suggest that while all three psychological needs proposed within self-determination theory are relevant to teacher wellbeing, their relative salience may fluctuate across career stages. Relatedness appeared particularly important during periods characterised by transition, uncertainty, and expanding professional demands, whereas autonomy became increasingly salient for mid- and late-career teachers seeking greater professional agency, flexibility, and control over their work. Competence, in turn, became more prominent among late-career teachers seeking continued meaning, relevance, and professional contribution. These differences suggest that a one-size-fits-all approach to teacher wellbeing is unlikely to be effective and that a career-stage-sensitive lens may offer more tailored, sustainable support.

8.1. Relatedness: the significance of connection across the career span

The findings of this study highlighted the importance of supportive relationships in contributing to teachers' wellbeing, in line with previous research, (Allen et al., 2021; Hascher & Waber, 2021; Roffey, 2020; Spilt et al., 2011). From students to teacher colleagues and school leadership, positive interactions play an important role in fostering teachers' sense of connection and wellbeing. Adding to past research, this study

provides evidence that the emphasis placed on different forms of relatedness varies across career stages, impacting teachers' wellbeing, as discussed below.

8.1.1. Early-career teachers

For early-career teachers, relatedness was primarily expressed through a strong need for collegial support, particularly in informal settings that enabled relationship-building, such as staff social gatherings. This finding aligns with previous research highlighting early-career teachers' reliance on others as they transition into the profession (Bressman et al., 2018; März & Kelchtermans, 2020; Squires, 2019). For example, Fox and Wilson (2015) found that beginning teachers actively sought both emotional and professional support through personal social networks. Informal, trust-based relationships – especially with fellow beginning teachers and approachable colleagues – played a key role in helping them feel supported, build confidence, and develop a sense of belonging to the profession. These social connections helped buffer the emotional demands of the early-career phase, promoting wellbeing by reducing isolation and enhancing resilience (Fox & Wilson, 2015).

The need for relatedness in early-career teachers was also expressed through positive student interactions. These relationships appear to foster job satisfaction through purpose, validation, connection, and joy, consistent with Spilt et al.'s (2011) research which highlighted the protective role of supportive teacher-student relationships in promoting teacher wellbeing. It also echoes Le Cornu (2013), who found that the development of strong, reciprocal relationships with students contributed significantly to early-career teachers' sense of resilience and identity as educators.

One possible explanation for the strong emphasis on relatedness among early-career teachers is that the transition into teaching may initially place greater emphasis on relational and emotional adjustment as teachers adapt to the realities of school life (Hulme & Wood, 2022; Tang et al., 2024). Beginning teachers often experience uncertainty, vulnerability, and identity negotiation, making supportive relationships particularly important during this phase (Nickel & Crosby, 2022). In this context, collegial and student relationships may provide emotional reassurance, reduce isolation, and foster a sense of belonging within the profession (Melzak et al., 2025). These relationships may also create the psychological safety needed for early-career teachers to gradually build confidence, capability, and professional identity over time (Rautamies et al., 2026).

8.1.2. Mid-career teachers

While collegial relationships and social activities also contributed to mid-career teachers' wellbeing, leadership support emerged as a vital role with this group. In particular, mid-career teachers valued school leaders' emotional support (e.g., "supportive leadership who check in on people"), responsiveness and trustworthiness (e.g., "the Principal acting on my concerns"), practical support (e.g., "they have a phone in each classroom, so whenever there is an issue with the students, we are able to quickly get support from a leader when needed"), and recognition and appreciation (e.g., "our principals do make sure to thank us for extra efforts through morning teas and emails"). In other words, when school leaders are accessible, communicative, and proactive, teachers feel safe, valued, and better equipped to manage the demands of their role, which positively impacts their wellbeing.

This finding is consistent with Cann et al.'s (2021) case study of an urban high school in New Zealand, which examined teachers' perceptions of leadership practices that influenced their wellbeing. The study found that teachers' wellbeing was enhanced when school leaders demonstrated relational skills (e.g., active listening, empathy, approachability, and the ability to build trust-based connections), listened to and valued staff contributions, and provided meaningful professional development alongside opportunities for agency.

As mentioned, the mid-career phase has been described as a "career mid-life crisis", marked by opportunities to grow as well as feelings of frustration (Cawte, 2020, p. 76). During this stage, teachers may take on additional responsibilities, such as mentoring others or leading initiatives, which can increase workload and stress (Lusty, 2013). Some may also begin to question their impact, experience stagnation, or feel overlooked compared to early-career colleagues receiving targeted support (Booth et al., 2021; Farrell, 2014).

Relatedness may therefore remain particularly salient for mid-career teachers because this career phase often coincides with increasing emotional and work demands (Longmuir, 2026). Supportive leadership relationships may help protect teacher wellbeing by fostering psychological safety, organisational commitment, and a sense of professional value during potentially demanding career periods (Adams, 2023). Unlike early-career teachers, whose relationships may centre more strongly on adjustment and belonging (Melzak et al., 2025), mid-career teachers may seek relational support that recognises their expertise, acknowledges their contribution, and provides opportunities for meaningful engagement (Brunetti & Marston, 2018).

8.1.3. Late-career teachers

For late-career teachers, the need for relatedness was strongly expressed through collegial support and team-based collaboration. These findings suggest that, even with extensive experience, late-career teachers continue to value and seek out meaningful connections, contributing to their wellbeing. However, compared to early- and mid-career teachers, who placed importance on social relationships in informal settings, late-career teachers emphasised the value of formal, structured, and professional relationships.

One possible explanation for this shift lies in the interplay between career stage, life phase, and evolving professional priorities (Van der Want et al., 2018; Veliz & Mainsbridge, 2024). As teachers approach the latter stages of their careers, they may experience changes in energy levels, personal responsibilities, and motivation, leading them to invest in relationships that are purposeful, affirming, and aligned with their sense of professional identity. Structured collaboration and collegial support may offer experienced teachers opportunities to share their expertise, remain connected to school goals, and sustain a sense of meaning and purpose. This is consistent with findings from Babic et al. (2022), who identified that late-career language teachers in Austria and the United Kingdom (UK) were more likely to thrive when embedded in positive workplace cultures that fostered collegiality and professional support. Their study highlighted that such relationships contributed to teachers' ongoing commitment and wellbeing, even as they approached retirement.

Another possible explanation could relate to teacher belonging and its relationship with relatedness, two constructs that are connected, sometimes overlapping, and have even been used interchangeably in educational research (Deci & Ryan, 1985; Allen et al., 2021). For many teachers, relationships serve as a primary source of belonging (Allen et al., 2025; Melzak et al., 2025). This applies to both teacher belonging to the profession and teacher belonging to the workplace. For professional belonging, Allen et al. (2025) found that interpersonal relationships, particularly with peers and students, were the most prominent facilitators of teachers' sense of belonging to the profession, with 75% of participants citing collegial connections as central to their professional identity. In terms of the workplace, Melzak et al. (2025) found that for early career teachers, workplace relationships formed the cornerstone of their belonging experiences, with mentoring relationships and peer support networks being critical for integration and retention. However, both pieces relate to belonging *to* something, rather than belonging *in*. The findings of the current study show that, in relation to wellbeing, it may be belonging *in* specific career-stage contexts where teachers feel supported within their immediate work environment through stage-appropriate activities and relationships, rather than belonging to the broader profession or context, that more directly influences teacher wellbeing outcomes. This reflects the enduring importance of relatedness needs as they shift and evolve across the teacher

lifecycle.

Taken together, our findings suggest that relatedness remained central to teacher wellbeing across the lifespan, but the form and function of relationships appeared to evolve. Early-career teachers primarily sought emotional reassurance and belonging as they navigated entry into the profession, whereas mid-career teachers emphasised relational leadership support in response to increasing responsibilities and potential career stagnation. In contrast, late-career teachers appeared to prioritise professionally meaningful and collaborative relationships that affirmed their expertise and ongoing contribution. These findings suggest that relatedness needs may shift from support-seeking toward professional affirmation across the teaching lifespan.

8.2. Autonomy: evolving needs for control

While autonomy, a core psychological need in motivation and wellbeing in self-determination theory (Deci & Ryan, 1985), featured in the experiences of early-career teachers, it was particularly salient for teachers in mid- and late-careers, reflecting their desire for increased professional agency and control over their work (see Table 2). This finding is unsurprising when considering teachers' developmental career phases, as it aligns with expanded responsibilities and leadership expectations that typically accompany these stages (Brunetti & Marston, 2018). Another possible explanation is that, as teachers accumulate experience and professional confidence over time, they may increasingly seek autonomy to exercise their professional judgement and implement practices they perceive as most effective for their students (Brunetti & Marston, 2018). Greater autonomy may therefore reflect not only changing workplace demands but also evolving expertise and professional identity across the teaching lifespan.

In practice, autonomy was frequently tied to the need for control over managing workload, time, and planning. Teachers consistently described how their wellbeing was supported when they had scheduled time for lesson preparation and assessment, flexibility in work hours; clear strategies to reduce workload, such as meeting-free weeks, minimal administrative demands, and the option to work from home on professional practice days. Research repeatedly shows that teachers' professional autonomy is related to their performance and wellbeing (Collie & Martin, 2017; Khan, 2023; Pan et al., 2023; Pogere et al., 2019). For example, Collie and Martin (2017) found that when teachers perceived greater autonomy support from their principals, they also reported higher levels of adaptability, a personal resource that enabled them to manage the demands of a dynamic school environment. In turn, both autonomy support and adaptability were positively associated with teachers' wellbeing and organisational commitment.

Similarly, recent research focusing on teacher training contexts highlights the risk to early-career teachers when autonomy is low and workloads are high (Pan et al., 2023). The study found that autonomy played a key protective role, buffering the negative effects of heavy workload, highlighting the importance of autonomy-supportive environments from the outset of a teacher's career. Together, these findings emphasise that fostering autonomy-supportive conditions across the teaching lifespan is essential for promoting wellbeing, professional growth, and long-term engagement in the profession.

8.3. Competence: building and sustaining capability

This study highlights the distinct ways in which late-career teachers experience the need for competence and how this contributes to their wellbeing. For these teachers, competence extended beyond classroom mastery to include sustaining meaningful engagement in teaching (e.g., "lightbulb moments" and "learning something new every day"), contributing to the growth of others (e.g., "sharing and comparing ideas and opinions with colleagues"), and remaining professionally relevant (e.g., "professional development that empowers and inspires new thought" and "innovating and improving teaching practice"). Their responses revealed that wellbeing was closely tied to opportunities to exercise expertise, mentor others, and participate in valued professional learning.

Our findings indicated that, compared to earlier career stages, where wellbeing was more strongly associated with relatedness and support, competence featured more prominently among late-career teachers as a source of meaning, contribution, and professional fulfilment. This may reflect a developmental shift from establishing oneself within the profession toward sustaining professional identity, relevance, and legacy. Once relational belonging and occupational stability are established, teachers may become increasingly motivated by opportunities to refine expertise, mentor others, and maintain a sense of professional contribution (Brouhier et al., 2026).

These findings complement and extend those of Keller-Schneider et al. (2020), who surveyed 655 primary school teachers in Switzerland and used structural equation modelling to examine how perceptions of competence and challenge influenced engagement in professional development (PD) across career stages. Their study found that late-career teachers valued PD that allowed for peer dialogue, reflection, and the sharing of expertise, preferences that reflect a broader definition of competence. Importantly, Keller-Schneider et al. (2020) observed that late-career teachers were more engaged in PD when their experience was acknowledged and when they could help shape the learning process, rather than simply receiving new techniques.

Building on these insights, the current study contributes to the literature by positioning competence not just as a factor in PD engagement, but as a key contributor to teacher wellbeing. By focusing on school-based activities that promote professional growth, legacy, and purpose, this study suggests that late-career teachers' wellbeing is sustained when their competence is affirmed through meaningful roles, reflective practice, and opportunities to remain impactful within their school communities.

Furthermore, the findings of this study are consistent with previous research which found that late-career teachers were motivated by a desire to leave a lasting impression as they approached retirement (Babic et al., 2022). The desire for purpose, meaningful engagement, and recognition was a recurring theme in teachers who remained committed and energised late into their careers. A significant proportion of late-career teachers reported wanting to leave a legacy by meaningfully contributing to the school community, passing on expertise, and influencing students and colleagues (Babic et al., 2022). Taken together, these findings highlight that late-career teachers are supported not just by continued skill development, but by opportunities to apply their expertise, engage in meaningful contribution, and feel valued in their professional community.

Overall, the findings of this study emphasise the value of a differentiated, career-stage-responsive approach to supporting teacher wellbeing. Rather than conceptualising wellbeing as static across the profession, the findings suggest that teachers' psychological needs evolve alongside their professional identities, responsibilities, and career trajectories. By recognising how and why wellbeing needs shift across the teaching lifespan, school leaders and policymakers may be better positioned to implement targeted forms of support that enhance wellbeing, engagement, professional fulfilment, and retention across the workforce. This study contributes to the growing body of research advocating for more context-specific approaches to teacher wellbeing (Hamling et al., 2020; Hine et al., 2022; R. Richards et al., 2018) that acknowledge the changing nature of teachers' professional experiences over time.

9. Limitations and future directions

While this study offers valuable insights into how teachers across different career stages perceive school-based activities that support their wellbeing, several limitations must be acknowledged. First, the study was conducted within the Australian education context, which is shaped

by distinct cultural, policy, and institutional factors. As such, transferability of findings to international settings may be limited. Future research would benefit from cross-cultural comparisons that explore how contextual factors influence teacher wellbeing and whether similar career-stage patterns are observed globally.

Second, the sample was predominantly composed of women working in secondary schools. Although this reflects key demographics of the Australian teaching workforce, it restricts the generalisability of the findings across gender and educational settings. Notably, the perspectives of primary school teachers may differ significantly. The study did not account for other potentially influential factors such as gender, school setting (e.g., urban vs rural), or cultural background. Future research could explore how these intersecting variables further shape teachers' wellbeing.

Finally, while the open-ended survey format provided rich, qualitative data from a relatively large and diverse sample, it did not allow for deeper probing of individual perspectives. In addition, the relatively small number of participants within some career-stage groups and the non-probability sampling approach limit the broader generalisability of the findings. As an exploratory study, the findings provide an initial insight into teachers' perceptions of wellbeing across career stages and offer a foundation for future research using larger, more systematically recruited samples. Future studies could extend this work by incorporating interviews or focus groups to further explore the nuances of wellbeing across career stages. Longitudinal designs may also provide valuable insight into how teachers' wellbeing priorities evolve over time and in response to broader system changes.

10. Implications for practice

Building on the finding that teachers' psychological needs are experienced differently across career stages, this section outlines actionable strategies for schools and policymakers to enhance teacher wellbeing. By aligning wellbeing initiatives with the evolving priorities of early-, mid-, and late-career teachers, schools can foster more meaningful and sustainable support. The following implications are organised by career stage and structured around the core psychological needs of relatedness, autonomy, and competence.

For early-career teachers, school-based activities that foster belonging and reduce isolation is key. Schools should prioritise informal and trust-based opportunities to connect with peers, such as a buddy system, staff social events, or early-career networks, as supportive collegial relationships are particularly important during the transition into teaching (Bressman et al., 2018; Fox & Wilson, 2015). Recognising the importance of early-career teachers' relationships with students, schools could create opportunities to build and maintain these connections. This may include manageable class sizes, consistent student groups, involvement in co-curricular activities, or structured time for pastoral care and informal interactions outside the classroom, which may help foster connection, belonging, and professional identity (Le Cornu, 2013; Spilt et al., 2011). While autonomy is still emerging, offering guided choice (e.g., in planning or assessment tasks) can help build agency in a supported environment.

To support mid-career teachers, school leaders play a vital role in fostering open communication, demonstrating responsiveness, and acknowledging their contributions. Practical strategies such as personalised feedback, informal check-ins, or public recognition promote a sense of being valued and professionally supported (Cann et al., 2021). Additionally, schools should also consider structural supports, such as administrative assistance or meeting-free planning days, to alleviate workload pressures that often increase during this career stage due to expanding professional responsibilities (Lusty, 2013). Such approaches may also support teachers' autonomy and wellbeing by providing greater control over workload, time, and planning (Collie & Martin, 2017).

For late-career teachers, schools should design professional development activities that move beyond the introduction of new techniques and, instead, position experienced teachers as co-creators of knowledge. Respecting their expertise means inviting them to help shape PD agendas, lead learning sessions, or participate in reflective teaching communities (Keller-Schneider et al., 2020). Moreover, initiatives that enable legacy-building, such as peer coaching, curriculum documentation, or leadership in induction programs, may help sustain late-career teachers' sense of purpose, contribution, and professional fulfilment (Babic et al., 2022; Brouhier et al., 2026). Structured, goal-oriented collaboration with colleagues also appears to play an important role in maintaining connection, engagement, and motivation during this career phase (Babic et al., 2022).

11. Conclusion

The primary aim of this study was to initially explore how in-service teachers at various career stages perceive school-based activities that support their wellbeing. Through the perspective of self-determination theory (Deci & Ryan, 1985), which posits that human motivation and wellbeing are driven by the fulfilment of the psychological needs of autonomy, relatedness, and competence, findings showed that while overlapping themes were identified across all career stages, school-based activities supporting teachers' wellbeing varied across career stages. For early-career teachers, collegial support, social activities, and managing workload were most prominent. While mid-career teachers emphasised managing workload and leadership support alongside collegial connection, late-career teachers placed greatest importance on team-based collaboration, workload, and meaningful professional development. These insights contribute to the growing body of research advocating for a differentiated approach to teacher wellbeing, highlighting the limitations of uniform strategies and the potential benefits of tailoring support to align with teachers' evolving roles and priorities over time.

CRediT authorship contribution statement

Duyen T. Vo: Writing – review & editing, Writing – original draft, Visualization, Validation, Methodology, Investigation, Formal analysis, Data curation. **Kelly-Ann Allen:** Writing – review & editing, Supervision. **Fiona Longmuir:** Writing – review & editing, Validation, Methodology, Formal analysis. **Andrea Reupert:** Writing – review & editing, Supervision.

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Declaration of competing interests

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

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Appendix 1

Overall Themes Across All Career Stages

Self-Determination Needs (SDT)	Themes
Relatedness	Collegial support and relationships
	Social activities
	Team-based collaboration
	Student interaction and engagement
	Relationships with parents
	Leadership support
	School culture
	Health and wellbeing through explicit practices
	Appreciated, recognised, and valued
Autonomy	Work autonomy
	Work-life balance
	Managing workload, time, and planning
	Breaks and downtime
Competence	Student success and achievement
	Teaching practice and professional development

Note. Themes were mapped to the psychological needs of relatedness, autonomy, and competence as outlined in self-determination theory (Deci & Ryan, 1985).

Data availability

The data that has been used is confidential.

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