

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

Appendices

Appendix 1

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

Prototype factors	Comb f (%)	En f (%)	Aust f (%)
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%)
Collaborating with colleagues when planning our/my mathematics teaching	16 (14%)	7 (13%)	9 (16%)
Having a reduced marking load in mathematics (through, for example, centralised and automated arrangements)	15 (14%)	12 (22%)	3 (5%)
Feeling valued and appreciated (by leadership, students, parents)	14 (13%)	8 (15%)	6 (11%)
As a teacher, having love and passion for mathematics	12 (11%)	7 (13%)	5 (9%)
Being able to teach mathematics adaptively, fulfilling students' diverse needs (i.e. adaptive teaching)	12 (11%)	1 (2%)	11 (20%)
Embracing continuous professional learning and growth in relation to my mathematics teaching	12 (11%)	4 (7%)	8 (14%)
Working with supportive parents/carers/families	12 (11%)	1 (2%)	11 (20%)
Working with a mathematics curriculum which is fit for purpose	11 (10%)	9 (16%)	2 (4%)
Being confident in teaching the mathematics curriculum	10 (9%)	2 (4%)	8 (14%)
Having a decreased load of administrative tasks	10 (9%)	7 (13%)	3 (5%)
Having strong leadership support	9 (8%)	2 (4%)	7 (13%)
Supportive learning atmosphere for staff, which does not focus on accountability	9 (8%)	1 (2%)	8 (14%)
Having access to good quality professional development in relation to mathematics teaching	8 (7%)	7 (13%)	1 (2%)
Having good relationships with colleagues	7 (6%)	5 (9%)	2 (4%)
As a mathematics teacher, feeling respected by others	6 (5%)	3 (5%)	3 (5%)
Having a bank of shared departmental/school worked examples and solutions to mathematical content	6 (5%)	5 (9%)	1 (2%)
Having resilience when teaching mathematics	6 (5%)	0 (0%)	6 (11%)
Having specialist support (from the inside and outside school), e.g. support agencies, allied health professionals, SEND departments, etc.	6 (5%)	6 (11%)	0 (0%)
Strong sense of school community, which celebrates everyone's small successes	6 (5%)	1 (2%)	5 (9%)
Working with students and parents who have realistic expectations of me as a mathematics teacher	6 (5%)	0 (0%)	6 (11%)
Being persistent in overcoming challenges when teaching mathematics	5 (5%)	0 (0%)	5 (9%)

Having my own good/positive previous experiences with mathematics	5 (5%)	0 (0%)	5 (9%)
Having opportunities to discuss mathematics teaching with colleagues	5 (5%)	2 (4%)	3 (5%)
Having time, as a teacher, to explore and enjoy mathematics	5 (5%)	3 (5%)	2 (4%)
Receiving positive feedback and encouragement from others when teaching mathematics	5 (5%)	1 (2%)	4 (7%)
Being adaptable	4 (4%)	1 (2%)	3 (5%)
Being organised and feeling in control in relation to my mathematics teaching	4 (4%)	3 (5%)	1 (2%)
Having my own comfortable and suitably designed classroom to teach mathematics	4 (4%)	4 (7%)	0 (0%)
Having the flexibility to manage my own time outside of taught lessons	4 (4%)	2 (4%)	2 (4%)
Working with quality mathematics assessments, which are fit for purpose	4 (4%)	2 (4%)	2 (4%)
Being empathetic	3 (3%)	1 (2%)	2 (4%)
Being patient and calm	3 (3%)	2 (4%)	1 (2%)
Engaging my students in mathematical problem-solving	3 (3%)	1 (2%)	2 (4%)
Having a good understanding of mathematics assessment (i.e. assessment literacy)	3 (3%)	3 (5%)	0 (0%)
Having good physical health / feeling well	3 (3%)	0 (0%)	3 (5%)
Having time to reflect on my mathematics teaching	3 (3%)	0 (0%)	3 (5%)
School's understanding of support for teachers' needs and mental health	3 (3%)	1 (2%)	2 (4%)
Working with students who have had good previous experiences with mathematics	3 (3%)	3 (5%)	0 (0%)
Working with students who have positive dispositions and attitudes towards mathematics	3 (3%)	0 (0%)	3 (5%)
As a teacher, having a good understanding of the mathematics curriculum	2 (2%)	0 (0%)	2 (4%)
Being curious as a mathematics teacher	2 (2%)	0 (0%)	2 (4%)
Being involved in mathematics department decision-making	2 (2%)	1 (2%)	1 (2%)
Being self-motivated in relation to my mathematics teaching	2 (2%)	1 (2%)	1 (2%)
Engaging my students in fun mathematical activities	2 (2%)	1 (2%)	1 (2%)
Having access to supportive and quality mentoring for my mathematics teaching	2 (2%)	0 (0%)	2 (4%)
Experiencing a sense of success in my mathematics teaching	1 (1%)	1 (2%)	0 (0%)
Having a uniform way of teaching mathematics across the mathematics department	1 (1%)	1 (2%)	0 (0%)
Having opportunities to observe the mathematics lessons of other colleagues	1 (1%)	1 (2%)	0 (0%)
Having time to support students with their mathematics inside the school working hours	1 (1%)	1 (2%)	0 (0%)
Working with mathematics students who have a growth mindset	1 (1%)	0 (0%)	1 (2%)

Note. En = England; Aust = Australia; Comb = combined

Appendix 2

Mean Centrality Ratings for a Combined sample and 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 manageable workload	9.35 (1.02)	9.30 (1.09)	9.39 (0.96)	-0.50	0.616	-0.09
Having good relationships with students	9.03 (1.16)	9.23 (1.25)	8.88 (1.07)	1.72	0.088	0.31
Being confident in teaching the mathematics curriculum	8.94 (1.08)	8.81 (1.19)	9.04 (0.98)	-1.23	0.222	-0.22

Working with supportive and approachable colleagues	8.84 (1.18)	9.04 (1.10)	8.68 (1.23)	1.70	0.091	0.30
Having good mathematics subject content knowledge	8.82 (1.41)	8.75 (1.55)	8.88 (1.29)	-0.48	0.630	-0.09
Having autonomy and trust to experiment with my mathematics teaching	8.76 (1.29)	8.88 (1.25)	8.67 (1.32)	0.92	0.360	0.16
Having time to think about and plan mathematics lessons	8.75 (1.41)	8.91 (1.47)	8.62 (1.36)	1.15	0.252	0.20
Experiencing a sense of success in my mathematics teaching	8.74 (1.48)	8.75 (1.69)	8.74 (1.29)	0.07	0.945	0.01
Feeling valued and appreciated (by leadership, students, parents)	8.74 (1.29)	8.81 (1.34)	8.69 (1.25)	0.49	0.624	0.09
Having high confidence in my own planning and teaching of mathematics lessons	8.74 (1.22)	8.81 (1.37)	8.68 (1.09)	0.59	0.559	0.10
Being organised and feeling in control in relation to my mathematics teaching	8.69 (1.45)	8.65 (1.48)	8.72 (1.43)	-0.28	0.777	-0.05
Having the flexibility to manage my own time outside of taught lessons	8.61 (1.56)	8.53 (1.68)	8.68 (1.46)	-0.56	0.579	-0.10
As a teacher, having a good understanding of the mathematics curriculum	8.61 (1.40)	8.77 (1.40)	8.49 (1.39)	1.15	0.251	0.20
Having good relationships with colleagues	8.60 (1.28)	8.74 (1.32)	8.49 (1.26)	1.10	0.272	0.20
Being adaptable	8.59 (1.36)	8.67 (1.15)	8.53 (1.50)	0.58	0.565	0.10
Having good physical health / feeling well	8.58 (1.65)	8.70 (1.53)	8.49 (1.73)	0.74	0.461	0.13
Working with a mathematics curriculum which is fit for purpose	8.58 (1.64)	8.49 (1.90)	8.65 (1.40)	-0.56	0.579	-0.10
Being patient and calm	8.56 (1.59)	8.60 (1.61)	8.53 (1.57)	0.24	0.807	0.04
Having strong leadership support	8.54 (1.51)	8.75 (1.57)	8.38 (1.46)	1.42	0.159	0.25
Having time to support students with their mathematics inside the school working hours	8.54 (1.65)	8.82 (1.31)	8.32 (1.88)	1.73	0.087	0.31
As a teacher, having love and passion for mathematics	8.52 (1.76)	8.60 (1.57)	8.46 (1.89)	0.44	0.658	0.08
Being able to teach mathematics adaptively, fulfilling students' diverse needs (i.e. adaptive teaching)	8.47 (1.51)	8.54 (1.60)	8.40 (1.44)	0.53	0.600	0.09
Having a consistent school-wide student behaviour policy	8.40 (1.87)	8.44 (1.96)	8.38 (1.80)	0.19	0.848	0.03
As a mathematics teacher, feeling respected by others	8.38 (1.60)	8.70 (1.83)	8.12 (1.38)	2.04	0.044	0.36
Being self-motivated in relation to my mathematics teaching	8.33 (1.66)	8.47 (1.76)	8.22 (1.57)	0.86	0.394	0.15
School's understanding of support for teachers' needs and mental health	8.32 (1.72)	8.68 (1.67)	8.03 (1.76)	2.15	0.033	0.38
Having resilience when teaching mathematics	8.30 (1.54)	8.68 (1.39)	8.00 (1.65)	2.50	0.014	0.44
Engaging my students in mathematical problem-solving	8.16 (1.63)	8.47 (1.56)	7.92 (1.68)	1.93	0.056	0.34
Having a decreased load of administrative tasks	8.16 (2.03)	8.42 (2.03)	7.94 (2.02)	1.33	0.187	0.24

Having opportunities to discuss mathematics teaching with colleagues	8.15 (1.81)	8.60 (1.65)	7.79 (1.93)	2.51	0.013	0.44
Being persistent in overcoming challenges when teaching mathematics	8.14 (1.68)	8.28 (1.79)	8.03 (1.58)	0.85	0.397	0.15
Embracing continuous professional learning and growth in relation to my mathematics teaching	8.12 (1.64)	8.42 (1.60)	7.89 (1.67)	1.83	0.070	0.32
Having time to reflect on my mathematics teaching	8.12 (1.77)	8.33 (1.69)	7.94 (1.83)	1.24	0.218	0.22
Working with students and parents who have realistic expectations of me as a mathematics teacher	7.99 (1.65)	8.30 (1.67)	7.75 (1.64)	1.87	0.064	0.33
Being curious as a mathematics teacher	7.98 (1.77)	8.37 (1.64)	7.67 (1.87)	2.23	0.027	0.40
Having a good understanding of mathematics assessment (i.e. assessment literacy)	7.97 (1.73)	8.40 (1.53)	7.62 (1.86)	2.54	0.012	0.45
Working with quality mathematics assessments, which are fit for purpose	7.95 (1.93)	8.04 (1.94)	7.88 (1.92)	0.47	0.640	0.08
Having access to good quality professional development in relation to mathematics teaching	7.93 (1.95)	8.25 (2.07)	7.68 (1.84)	1.64	0.104	0.29
Strong sense of school community, which celebrates everyone's small successes	7.92 (1.78)	8.00 (1.91)	7.86 (1.67)	0.44	0.661	0.08
Supportive learning atmosphere for staff, which does not focus on accountability	7.89 (1.97)	7.58 (2.20)	8.14 (1.77)	-1.60	0.111	-0.28
Having access to physical and technological resources for mathematics teaching	7.87 (1.74)	8.25 (1.65)	7.57 (1.81)	2.19	0.030	0.39
Working with students who are engaged with mathematics	7.86 (1.98)	7.93 (1.97)	7.81 (1.99)	0.35	0.724	0.06
Having time, as a teacher, to explore and enjoy mathematics	7.81 (2.04)	8.32 (2.11)	7.42 (1.98)	2.49	0.014	0.44
Being empathetic	7.81 (1.90)	8.35 (1.63)	7.38 (2.09)	2.90	0.004	0.51
Working with mathematics students who have a growth mindset	7.71 (1.97)	8.07 (1.96)	7.43 (1.98)	1.83	0.070	0.32
Engaging my students in fun mathematical activities	7.67 (2.17)	8.28 (2.05)	7.18 (2.27)	2.85	0.005	0.51
Working with supportive parents/carers/families	7.64 (1.71)	7.98 (1.60)	7.38 (1.79)	2.01	0.047	0.36
Receiving positive feedback and encouragement from others when teaching mathematics	7.57 (1.88)	7.65 (1.80)	7.51 (1.95)	0.40	0.686	0.07
Having my own comfortable and suitably designed classroom to teach mathematics	7.47 (2.16)	7.72 (1.97)	7.26 (2.30)	1.19	0.237	0.21
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

Being involved in mathematics department decision-making	7.31 (2.25)	7.53 (2.18)	7.14 (2.30)	0.97	0.333	0.17
Having my own good/positive previous experiences with mathematics	7.26 (2.52)	7.93 (2.22)	6.74 (2.73)	2.67	0.009	0.47
Working with students who have positive dispositions and attitudes towards mathematics	7.19 (2.17)	7.63 (2.11)	6.83 (2.21)	2.08	0.040	0.37
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
Having opportunities to observe the mathematics lessons of other colleagues	7.10 (2.10)	7.74 (2.05)	6.60 (2.14)	3.06	0.003	0.54
Having reduced marking load in mathematics (through, for example, centralised and automated arrangements)	7.09 (2.34)	6.95 (2.46)	7.21 (2.23)	-0.63	0.530	-0.11
Having specialist support (from the inside and outside school), e.g. support agencies, allied health professionals, SEND departments, etc.	6.72 (2.27)	6.74 (2.48)	6.71 (2.09)	0.07	0.944	0.01
Working with students who have had good previous experiences with mathematics	6.22 (2.41)	6.56 (2.64)	5.94 (2.21)	1.45	0.151	0.26
Having a uniform way of teaching mathematics across the mathematics department	5.88 (2.71)	6.44 (2.73)	5.44 (2.70)	2.07	0.040	0.37

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 $\alpha = .05/60$).

Appendix 3

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>
Having a manageable workload	9.35 (1.02)	9.43 (1.08)	9.30 (0.98)	0.65	0.517	0.12
Having good relationships with students	9.03 (1.16)	9.26 (1.09)	8.90 (1.19)	1.67	0.098	0.30
Being confident in teaching the mathematic curriculum	8.94 (1.08)	9.02 (0.90)	8.89 (1.18)	0.66	0.510	0.12
Working with supportive and approachable colleagues	8.84 (1.18)	8.66 (1.32)	8.94 (1.09)	-1.29	0.198	-0.24
Having good mathematics subject content knowledge	8.82 (1.40)	9.00 (1.06)	8.72 (1.57)	1.09	0.277	0.20
Having autonomy and trust to experiment with my mathematics teaching	8.76 (1.29)	8.85 (1.44)	8.71 (1.20)	0.61	0.545	0.11
Having time to think about and plan mathematics lessons	8.75 (1.41)	8.85 (1.40)	8.70 (1.42)	0.60	0.547	0.11
Experiencing a sense of success in my mathematics teaching	8.74 (1.45)	9.11 (1.11)	8.54 (1.62)	2.14	0.034	0.39
Feeling valued and appreciated (by leadership, students, parents)	8.74 (1.29)	8.66 (1.40)	8.79 (1.22)	-0.56	0.574	-0.10

Having high confidence in my own planning and teaching of mathematics lessons	8.74 (1.22)	8.77 (1.20)	8.72 (1.23)	0.21	0.835	0.04
Being organised and feeling in control in relation to my mathematics teaching	8.69 (1.45)	8.83 (1.29)	8.61 (1.53)	0.83	0.408	0.15
Having the flexibility to manage my own time outside of taught lessons	8.61 (1.56)	8.49 (1.84)	8.68 (1.38)	-0.68	0.499	-0.12
As a teacher, having a good understanding of the mathematics curriculum	8.61 (1.40)	8.79 (1.23)	8.51 (1.48)	1.08	0.284	0.20
Having good relationships with colleagues	8.60 (1.29)	8.51 (1.44)	8.65 (1.19)	-0.58	0.566	-0.11
Being adaptable	8.59 (1.35)	8.85 (1.30)	8.44 (1.37)	1.67	0.097	0.31
Having good physical health / feeling well	8.58 (1.65)	8.47 (1.86)	8.65 (1.51)	-0.59	0.555	-0.11
Working with a mathematics curriculum which is fit for purpose	8.58 (1.59)	9.11 (1.01)	8.28 (1.84)	2.84	0.005	0.52
Being patient and calm	8.56 (1.58)	8.77 (1.48)	8.44 (1.63)	1.13	0.260	0.21
Having strong leadership support	8.54 (1.52)	8.45 (1.70)	8.60 (1.40)	-0.54	0.589	-0.10
Having time to support students with their mathematics inside the school working hours	8.54 (1.66)	8.74 (1.47)	8.43 (1.76)	1.05	0.298	0.19
As a teacher, having love and passion for mathematics	8.52 (1.74)	8.17 (1.85)	8.72 (1.67)	-1.73	0.086	-0.32
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 consistent school-wide student behaviour policy	8.40 (1.86)	8.60 (1.80)	8.29 (1.90)	0.89	0.375	0.16
As a mathematics teacher, feeling respected by others	8.38 (1.61)	8.64 (1.45)	8.23 (1.69)	1.38	0.170	0.25
Being self-motivated in relation to my mathematics teaching	8.33 (1.66)	8.34 (1.80)	8.33 (1.58)	0.04	0.971	0.01
School's understanding of support for teachers' needs and mental health	8.32 (1.74)	8.60 (1.58)	8.16 (1.82)	1.37	0.172	0.25
Having resilience when teaching mathematics	8.30 (1.58)	8.43 (1.47)	8.23 (1.64)	0.67	0.503	0.12
Engaging my students in mathematical problem-solving	8.16 (1.64)	8.43 (1.58)	8.01 (1.67)	1.38	0.171	0.25
Having a decreased load of administrative tasks	8.16 (2.03)	8.36 (2.00)	8.04 (2.05)	0.87	0.384	0.16
Having opportunities to discuss mathematics teaching with colleagues	8.15 (1.85)	7.96 (1.88)	8.26 (1.83)	-0.88	0.379	-0.16
Being persistent in overcoming challenges when teaching mathematics	8.14 (1.67)	8.38 (1.44)	8.00 (1.79)	1.25	0.213	0.23
Embracing continuous professional learning and growth in relation to my mathematics teaching	8.12 (1.61)	8.66 (1.45)	7.82 (1.70)	2.85	0.005	0.52
Having time to reflect on my mathematics teaching	8.12 (1.78)	8.09 (1.99)	8.13 (1.65)	-0.15	0.881	-0.03

Working with students and parents who have realistic expectations of me as a mathematics teacher	7.99 (1.68)	7.94 (1.82)	8.02 (1.59)	-0.29	0.774	-0.05
Being curious as a mathematics teacher	7.98 (1.81)	8.00 (1.82)	7.96 (1.80)	0.11	0.912	0.02
Having a good understanding of mathematics assessment (i.e. assessment literacy)	7.97 (1.76)	8.15 (2.01)	7.87 (1.61)	0.88	0.382	0.16
Working with quality mathematics assessments, which are fit for purpose	7.95 (1.91)	8.30 (1.86)	7.74 (1.94)	1.59	0.115	0.29
Having access to good quality professional development in relation to mathematics teaching	7.93 (1.92)	8.51 (1.64)	7.60 (2.06)	2.60	0.010	0.48
Strong sense of school community, which celebrates everyone's small successes	7.92 (1.77)	8.21 (1.89)	7.76 (1.70)	1.41	0.160	0.26
Supportive learning atmosphere for staff, which does not focus on accountability	7.89 (1.98)	8.06 (1.90)	7.79 (2.03)	0.75	0.457	0.14
Having access to physical and technological resources for mathematics teaching	7.87 (1.75)	8.23 (1.62)	7.66 (1.82)	1.80	0.075	0.33
Working with students who are engaged with mathematics	7.86 (1.98)	7.81 (2.06)	7.89 (1.94)	-0.23	0.822	-0.04
Having time, as a teacher, to explore and enjoy mathematics	7.81 (2.09)	7.72 (1.92)	7.87 (2.18)	-0.37	0.710	-0.07
Being empathetic	7.81 (1.96)	7.89 (2.10)	7.76 (1.88)	0.38	0.702	0.07
Working with mathematics students who have a growth mindset	7.71 (2.00)	7.77 (2.20)	7.68 (1.88)	0.23	0.821	0.04
Engaging my students in fun mathematical activities	7.67 (2.17)	8.40 (1.96)	7.24 (2.28)	2.92	0.004	0.53
Working with supportive parents/carers/families	7.64 (1.73)	7.85 (1.94)	7.52 (1.59)	1.03	0.303	0.19
Receiving positive feedback and encouragement from others when teaching mathematics	7.57 (1.87)	7.91 (1.73)	7.38 (1.94)	1.57	0.119	0.29
Having my own comfortable and suitably designed classroom to teach mathematics	7.47 (2.17)	7.49 (2.22)	7.45 (2.15)	0.10	0.924	0.02
Having a bank of shared department/school, worked examples and solutions to mathematical content	7.37 (2.22)	7.77 (2.22)	7.15 (2.22)	1.52	0.130	0.28
Collaborating with colleagues when planning our/my mathematics teaching	7.33 (2.38)	7.62 (2.67)	7.17 (2.20)	1.03	0.307	0.19
Being involved in mathematics department decision-making	7.31 (2.24)	6.94 (2.48)	7.52 (2.09)	-1.44	0.154	-0.26
Having my own good/positive previous experiences with mathematics	7.26 (2.57)	6.91 (2.87)	7.46 (2.39)	-1.16	0.246	-0.21
Working with students who have positive dispositions and attitudes towards mathematics	7.19 (2.19)	7.57 (2.04)	6.96 (2.26)	1.53	0.129	0.28
Having access to supportive and quality mentoring for my mathematics teaching	7.10 (2.22)	7.53 (2.24)	6.85 (2.21)	1.67	0.098	0.31

Having opportunities to observe the mathematics lessons of other colleagues	7.10 (2.13)	7.66 (2.02)	6.78 (2.19)	2.25	0.026	0.41
Having reduced marking load in mathematics (through, for example, centralised and automated arrangements)	7.09 (2.32)	7.51 (2.26)	6.85 (2.35)	1.55	0.124	0.28
Having specialist support (from the inside and outside school), e.g. support agencies, allied health professionals, SEND departments, etc.	6.72 (2.24)	7.19 (1.95)	6.45 (2.39)	1.80	0.074	0.33
Working with students who have had good previous experiences with mathematics	6.22 (2.41)	6.60 (2.45)	6.00 (2.39)	1.35	0.179	0.25
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. 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 $\alpha = .05/60$).

Appendix 4

Mean Centrality Ratings by Sector Within Each 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 manageable workload	9.38 (1.16)	9.25 (1.05)	0.44	0.66 4	0.12	9.46 (1.03)	9.35 (0.92)	0.48	0.632	0.12
Having good relationships with students	9.67 (0.66)	8.97 (1.44)	2.08	0.04 3	0.57	8.92 (1.26)	8.85 (0.97)	0.28	0.777	0.07
Being confident in teaching the mathematic curriculum	9.14 (0.85)	8.61 (1.32)	1.66	0.10 3	0.45	8.92 (0.93)	9.11 (1.02)	-0.77	0.446	-0.19
Working with supportive and approachable colleagues	9.00 (1.22)	9.06 (1.04)	- 0.18	0.85 6	- 0.05	8.38 (1.36)	8.85 (1.13)	-1.55	0.126	-0.38
Having good mathematics subject content knowledge	9.19 (1.03)	8.50 (1.75)	1.65	0.10 5	0.45	8.85 (1.08)	8.89 (1.40)	-0.14	0.888	-0.03
Having autonomy and trust to experiment with my mathematics teaching	9.05 (1.28)	8.78 (1.24)	0.78	0.43 8	0.21	8.69 (1.57)	8.65 (1.18)	0.12	0.903	0.03
Having time to think about and plan mathematics lessons	9.10 (1.18)	8.81 (1.62)	0.72	0.47 7	0.20	8.65 (1.55)	8.61 (1.26)	0.13	0.893	0.03
Experiencing a sense of success in my mathematics teaching	9.14 (1.31)	8.53 (1.86)	1.33	0.18 8	0.37	9.08 (0.93)	8.54 (1.43)	1.71	0.092	0.42
Feeling valued and appreciated (by	8.90 (1.30)	8.75 (1.38)	0.42	0.67 8	0.11	8.46 (1.48)	8.83 (1.10)	-1.19	0.238	-0.29

leadership, students, parents)										
Having high confidence in my own planning and teaching of mathematics lessons	9.05 (1.16)	8.67 (1.47)	1.01	0.31 5	0.28	8.54 (1.21)	8.76 (1.02)	-0.83	0.408	-0.20
Being organised and feeling in control in relation to my mathematics teaching	8.90 (1.26)	8.50 (1.59)	0.99	0.32 4	0.27	8.77 (1.34)	8.70 (1.49)	0.21	0.835	0.05
Having the flexibility to manage my own time outside of taught lessons	8.71 (1.59)	8.42 (1.75)	0.64	0.52 4	0.18	8.31 (2.04)	8.89 (0.97)	-1.65	0.104	-0.40
As a teacher, having a good understanding of the mathematics curriculum	9.14 (0.96)	8.56 (1.58)	1.54	0.12 8	0.42	8.50 (1.36)	8.48 (1.43)	0.06	0.950	0.02
Having good relationships with colleagues	8.62 (1.50)	8.81 (1.21)	- 0.51	0.61 0	- 0.14	8.42 (1.42)	8.52 (1.17)	-0.32	0.751	-0.08
Being adaptable	9.05 (1.16)	8.44 (1.11)	1.95	0.05 6	0.54	8.69 (1.41)	8.43 (1.56)	0.70	0.488	0.17
Having good physical health / feeling well	8.90 (1.55)	8.58 (1.54)	0.76	0.45 1	0.21	8.12 (2.05)	8.70 (1.50)	-1.38	0.173	-0.34
Working with a mathematics curriculum which is fit for purpose	9.14 (1.06)	8.11 (2.17)	2.03	0.04 7	0.56	9.08 (0.98)	8.41 (1.54)	1.98	0.052	0.49
Being patient and calm	8.95 (1.36)	8.39 (1.73)	1.28	0.20 6	0.35	8.62 (1.58)	8.48 (1.57)	0.35	0.724	0.09
Having strong leadership support	9.00 (1.30)	8.61 (1.71)	0.90	0.37 3	0.25	8.00 (1.88)	8.59 (1.13)	-1.66	0.101	-0.41
Having time to support students with their mathematics inside the school working hours	8.67 (1.46)	8.92 (1.23)	- 0.69	0.49 2	- 0.19	8.81 (1.50)	8.04 (2.02)	1.68	0.097	0.41
As a teacher, having love and passion for mathematics	8.71 (1.42)	8.53 (1.66)	0.43	0.66 9	0.12	7.73 (2.05)	8.87 (1.68)	-2.55	0.013	-0.63
Being able to teach mathematics adaptively, fulfilling students' diverse needs (i.e. adaptive teaching)	9.29 (1.06)	8.11 (1.72)	2.83	0.00 7	0.78	8.88 (1.14)	8.13 (1.53)	2.19	0.032	0.54
Having a consistent school-wide student behaviour policy	8.81 (1.99)	8.22 (1.93)	1.10	0.27 8	0.30	8.42 (1.65)	8.35 (1.89)	0.17	0.866	0.04
As a mathematics teacher, feeling respected by others	9.29 (1.06)	8.36 (2.10)	1.88	0.06 6	0.52	8.12 (1.53)	8.13 (1.31)	-0.04	0.965	-0.01
Being self-motivated in relation to my mathematics teaching	8.86 (1.56)	8.25 (1.86)	1.26	0.21 3	0.35	7.92 (1.90)	8.39 (1.34)	-1.22	0.226	-0.30
School's understanding of support for teachers' needs and mental health	8.95 (1.40)	8.53 (1.81)	0.92	0.35 9	0.25	8.31 (1.69)	7.87 (1.80)	1.01	0.314	0.25

Having resilience when teaching mathematics	9.05 (1.07)	8.47 (1.52)	1.52	0.13 3	0.42	7.92 (1.57)	8.04 (1.71)	-0.29	0.769	-0.07
Engaging my students in mathematical problem-solving	8.90 (1.45)	8.22 (1.59)	1.62	0.11 2	0.44	8.04 (1.61)	7.85 (1.74)	0.46	0.648	0.11
Having a decreased load of administrative tasks	8.57 (1.91)	8.33 (2.12)	0.42	0.67 4	0.12	8.19 (2.10)	7.80 (1.98)	0.78	0.438	0.19
Having opportunities to discuss mathematics teaching with colleagues	8.81 (1.36)	8.47 (1.80)	0.74	0.46 0	0.20	7.27 (1.97)	8.09 (1.86)	-1.75	0.084	-0.43
Being persistent in overcoming challenges when teaching mathematics	8.76 (1.22)	8.00 (2.01)	1.57	0.12 2	0.43	8.08 (1.55)	8.00 (1.62)	0.20	0.845	0.05
Embracing continuous professional learning and growth in relation to my mathematics teaching	9.10 (1.30)	8.03 (1.65)	2.54	0.01 4	0.70	8.31 (1.49)	7.65 (1.74)	1.61	0.111	0.40
Having time to reflect on my mathematics teaching	8.95 (1.20)	7.97 (1.84)	2.18	0.03 4	0.60	7.38 (2.23)	8.26 (1.50)	-1.99	0.050	-0.49
Working with students and parents who have realistic expectations of me as a mathematics teacher	8.38 (1.88)	8.25 (1.56)	0.28	0.77 8	0.08	7.58 (1.72)	7.85 (1.61)	-0.67	0.505	-0.16
Being curious as a mathematics teacher	8.90 (1.34)	8.06 (1.74)	1.93	0.05 9	0.53	7.27 (1.85)	7.89 (1.86)	-1.36	0.177	-0.33
Having a good understanding of mathematics assessment (i.e. assessment literacy)	9.00 (1.18)	8.06 (1.62)	2.33	0.02 4	0.64	7.46 (2.28)	7.72 (1.60)	-0.56	0.580	-0.14
Working with quality mathematics assessments, which are fit for purpose	8.67 (1.59)	7.67 (2.04)	1.93	0.05 9	0.53	8.00 (2.04)	7.80 (1.87)	0.41	0.681	0.10
Having access to good quality professional development in relation to mathematics teaching	8.86 (1.65)	7.89 (2.23)	1.73	0.08 9	0.48	8.23 (1.61)	7.37 (1.91)	1.94	0.057	0.48
Strong sense of school community, which celebrates everyone's small successes	8.14 (2.08)	7.92 (1.83)	0.43	0.67 0	0.12	8.27 (1.76)	7.63 (1.60)	1.57	0.120	0.39
Supportive learning atmosphere for staff, which does not focus on accountability	8.05 (1.80)	7.31 (2.38)	1.24	0.22 1	0.34	8.08 (2.02)	8.17 (1.64)	-0.22	0.825	-0.05
Having access to physical and technological resources for	8.48 (1.72)	8.11 (1.62)	0.80	0.42 5	0.22	8.04 (1.54)	7.30 (1.91)	1.68	0.098	0.41

mathematics teaching										
Working with students who are engaged with mathematics	8.48 (1.83)	7.61 (2.00)	1.62	0.11 1	0.45	7.27 (2.11)	8.11 (1.88)	-1.74	0.086	-0.43
Having time, as a teacher, to explore and enjoy mathematics	8.90 (1.22)	7.97 (2.44)	1.63	0.10 9	0.45	6.77 (1.86)	7.78 (1.97)	-2.14	0.036	-0.53
Being empathetic	8.57 (1.40)	8.22 (1.76)	0.78	0.44 1	0.21	7.35 (2.42)	7.39 (1.90)	-0.09	0.930	-0.02
Working with mathematics students who have a growth mindset	8.62 (1.94)	7.75 (1.93)	1.64	0.10 7	0.45	7.08 (2.19)	7.63 (1.85)	-1.14	0.259	-0.28
Engaging my students in fun mathematical activities	9.24 (1.22)	7.72 (2.24)	2.86	0.00 6	0.79	7.73 (2.20)	6.87 (2.27)	1.56	0.122	0.38
Working with supportive parents/carers/families	8.43 (1.69)	7.72 (1.50)	1.63	0.10 8	0.45	7.38 (2.04)	7.37 (1.65)	0.03	0.973	0.01
Receiving positive feedback and encouragement from others when teaching mathematics	8.24 (1.48)	7.31 (1.89)	1.93	.005 8	.53	7.65 (1.87)	7.43 (1.98)	.46	.646	.11
Having my own comfortable and suitably designed classroom to teach mathematics	7.95 (2.01)	7.58 (1.96)	0.68	0.50 0	0.19	7.12 (2.34)	7.35 (2.30)	-0.41	0.684	-0.10
Having a bank of shared department/school, worked examples and solutions to mathematical content	8.62 (2.20)	7.83 (1.99)	1.38	0.17 3	0.38	7.08 (2.02)	6.61 (2.27)	0.88	0.384	0.21
Collaborating with colleagues when planning our/my mathematics teaching	9.24 (1.09)	7.94 (1.88)	2.87	0.00 6	0.79	6.31 (2.85)	6.57 (2.26)	-0.42	0.674	-0.10
Being involved in mathematics department decision-making	7.29 (2.45)	7.67 (2.03)	- 0.63	0.52 9	- 0.17	6.65 (2.51)	7.41 (2.16)	-1.35	0.181	-0.33
Having my own good/positive previous experiences with mathematics	7.86 (2.65)	7.97 (1.96)	- 0.19	0.85 2	- 0.05	6.15 (2.85)	7.07 (2.64)	-1.37	0.176	-0.34
Working with students who have positive dispositions and attitudes towards mathematics	7.95 (1.88)	7.44 (2.24)	0.87	0.38 5	0.24	7.27 (2.15)	6.59 (2.24)	1.26	0.211	0.31
Having access to supportive and quality mentoring for my mathematics teaching	8.90 (1.26)	7.67 (1.84)	2.73	0.00 8	0.75	6.42 (2.27)	6.22 (2.29)	0.37	0.714	0.09

Having opportunities to observe the mathematics lessons of other colleagues	8.76 (1.48)	7.14 (2.11)	3.10	0.00 3	0.85	6.77 (1.99)	6.50 (2.24)	0.51	0.612	0.13
Having reduced marking load in mathematics (through, for example, centralised and automated arrangements)	7.43 (2.38)	6.67 (2.50)	1.13	0.26 3	0.31	7.58 (2.21)	7.00 (2.24)	1.05	0.295	0.26
Having specialist support (from the inside and outside school), e.g. support agencies, allied health professionals, SEND departments, etc.	7.76 (1.76)	6.14 (2.66)	2.49	0.01 6	0.68	6.73 (2.01)	6.70 (2.16)	0.07	0.946	0.02
Working with students who have had good previous experiences with mathematics	7.05 (2.71)	6.28 (2.59)	1.06	0.29 2	0.29	6.23 (2.20)	5.78 (2.22)	0.83	0.412	0.20
Having a uniform way of teaching mathematics across the mathematics department*	8.14 (1.98)	5.44 (2.62)	4.08	<.00 1	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 $\alpha = .05/60$).

Appendix 5

Mean Centrality Ratings by number of years of experience

Factor	≤ 5 yrs M (SD)	6+ yrs M (SD)	t(135)	p	d
Having a manageable workload	9.19 (1.17)	9.36 (0.99)	-0.78	0.434	-0.16
Working with supportive and approachable colleagues	9.10 (1.22)	8.77 (1.20)	1.32	0.190	0.27
Feeling valued and appreciated (by leadership, students, parents)	8.87 (1.18)	8.72 (1.34)	0.58	0.565	0.12
Being confident in teaching the mathematics curriculum	8.87 (1.12)	8.94 (1.10)	-0.32	0.749	-0.07
Having good relationships with students	8.81 (1.40)	9.06 (1.14)	-1.02	0.309	-0.21
Experiencing a sense of success in my mathematics teaching	8.68 (1.97)	8.75 (1.31)	-0.26	0.799	-0.05
Having autonomy and trust to experiment with my mathematics teaching	8.65 (1.58)	8.79 (1.22)	-0.55	0.583	-0.11
Being adaptable	8.65 (1.58)	8.53 (1.41)	0.39	0.694	0.08

Factor	≤5 yrs <i>M</i> (<i>SD</i>)	6+ yrs <i>M</i> (<i>SD</i>)	t(135)	p	d
Having good physical health / feeling well	8.61 (1.48)	8.58 (1.67)	0.08	0.933	0.02
Having high confidence in my own planning and teaching of mathematics lessons	8.58 (1.54)	8.77 (1.09)	-0.78	0.434	-0.16
Having time to think about and plan mathematics lessons	8.58 (1.50)	8.77 (1.42)	-0.66	0.513	-0.13
Being self-motivated in relation to my mathematics teaching	8.55 (1.69)	8.30 (1.64)	0.73	0.466	0.15
As a teacher, having love and passion for mathematics	8.55 (1.63)	8.52 (1.76)	0.08	0.934	0.02
Having strong leadership support	8.55 (1.26)	8.55 (1.56)	0.00	0.997	0.00
Having good relationships with colleagues	8.48 (1.31)	8.63 (1.31)	-0.55	0.581	-0.11
Being patient and calm	8.48 (1.52)	8.61 (1.59)	-0.40	0.688	-0.08
Having the flexibility to manage my own time outside of taught lessons	8.48 (1.41)	8.58 (1.60)	-0.32	0.752	-0.06
Having time to support students with their mathematics inside the school working hours	8.45 (1.69)	8.47 (1.75)	-0.06	0.955	-0.01
Having a consistent school-wide student behaviour policy	8.45 (1.84)	8.42 (1.84)	0.07	0.943	0.01
Working with a mathematics curriculum which is fit for purpose	8.42 (1.88)	8.66 (1.54)	-0.73	0.468	-0.15
Being organised and feeling in control in relation to my mathematics teaching	8.42 (1.89)	8.72 (1.31)	-1.00	0.319	-0.20
As a mathematics teacher, feeling respected by others	8.39 (1.82)	8.36 (1.57)	0.09	0.932	0.02
As a teacher, having a good understanding of the mathematics curriculum	8.35 (1.66)	8.69 (1.31)	-1.17	0.244	-0.24
Having a decreased load of administrative tasks	8.32 (1.76)	8.08 (2.10)	0.57	0.567	0.12
Having resilience when teaching mathematics	8.26 (1.88)	8.26 (1.58)	-0.02	0.986	-0.00
Having time to reflect on my mathematics teaching	8.26 (1.84)	8.17 (1.75)	0.24	0.807	0.05
Having good mathematics subject content knowledge	8.26 (1.88)	8.95 (1.18)	-2.49	0.014*	-0.51
School's understanding of support for teachers' needs and mental health	8.26 (2.18)	8.34 (1.60)	-0.23	0.819	-0.05
Collaborating with colleagues when planning to teach mathematics	8.23 (2.28)	7.06 (2.37)	2.44	0.016*	0.50
Working with students and parents who have realistic expectations of me as a mathematics teacher	8.19 (1.78)	7.96 (1.62)	0.68	0.495	0.14
Working with students who are engaged with mathematics	8.13 (1.98)	7.76 (1.95)	0.91	0.364	0.19
Having a good understanding of mathematics assessment (i.e. assessment literacy)	8.13 (1.77)	7.93 (1.75)	0.54	0.587	0.11

Factor	≤5 yrs <i>M</i> (<i>SD</i>)	6+ yrs <i>M</i> (<i>SD</i>)	t(135)	p	d
Working with quality mathematics assessments, which are fit for purpose	8.10 (1.80)	7.92 (1.95)	0.44	0.660	0.09
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
Being able to teach mathematics adaptively, fulfilling students' diverse needs (i.e. adaptive teaching)	8.03 (2.17)	8.54 (1.35)	-1.58	0.116	-0.32
Having opportunities to discuss mathematics teaching with colleagues	8.03 (1.96)	8.15 (1.77)	-0.32	0.749	-0.07
Embracing continuous professional learning and growth in relation to my mathematics teaching	8.00 (1.73)	8.17 (1.59)	-0.51	0.610	-0.10
Being persistent in overcoming challenges when teaching mathematics	8.00 (1.73)	8.18 (1.64)	-0.53	0.599	-0.11
Being curious as a mathematics teacher	8.00 (2.02)	7.97 (1.72)	0.08	0.938	0.02
Working with mathematics students who have a growth mindset	8.00 (1.61)	7.65 (2.07)	0.87	0.388	0.18
Engaging my students in mathematical problem-solving	7.90 (1.49)	8.22 (1.68)	-0.93	0.352	-0.19
Having a bank of shared department/school, worked examples and solutions to mathematical content	7.87 (2.09)	7.28 (2.22)	1.32	0.191	0.27
Having access to good quality professional development in relation to mathematics teaching	7.87 (1.91)	7.95 (1.95)	-0.21	0.837	-0.04
Having my own comfortable and suitably designed classroom to teach mathematics	7.84 (1.49)	7.45 (2.31)	0.88	0.382	0.18
Having access to physical and technological resources for mathematics teaching	7.77 (2.16)	7.89 (1.70)	-0.30	0.762	-0.06
Strong sense of school community, which celebrates everyone's small successes	7.74 (1.75)	7.98 (1.78)	-0.66	0.511	-0.13
Supportive learning atmosphere for staff, which does not focus on accountability	7.68 (1.83)	7.95 (1.99)	-0.69	0.491	-0.14
Engaging my students in fun mathematical activities	7.68 (1.85)	7.58 (2.38)	0.22	0.827	0.04
Receiving positive feedback and encouragement from others when teaching mathematics	7.65 (1.91)	7.59 (1.87)	0.13	0.895	0.03
Being empathetic	7.65 (1.66)	7.80 (2.06)	-0.39	0.699	-0.08
Having time, as a teacher, to explore and enjoy mathematics	7.48 (2.50)	7.96 (1.90)	-1.14	0.255	-0.23
Having opportunities to observe the mathematics lessons of other colleagues	7.45 (2.13)	6.92 (2.20)	1.20	0.230	0.25
Working with students who have positive dispositions and attitudes towards mathematics	7.45 (1.86)	7.11 (2.25)	0.76	0.446	0.16
Having my own good/positive previous experiences with mathematics	7.39 (2.36)	7.22 (2.60)	0.33	0.744	0.07
Working with supportive parents/carers/families	7.32 (1.87)	7.72 (1.69)	-1.12	0.266	-0.23
Having reduced marking load in mathematics (through, for example, centralised and automated arrangements)	7.26 (1.93)	7.15 (2.42)	0.23	0.822	0.05

Factor	≤5 yrs <i>M</i> (<i>SD</i>)	6+ yrs <i>M</i> (<i>SD</i>)	t(135)	p	d
Being involved in mathematics department decision-making	7.16 (2.24)	7.40 (2.24)	-0.51	0.608	-0.11
Having specialist support (from the inside and outside school), e.g. support agencies, allied health professionals, SEND departments, etc.	6.87 (2.19)	6.68 (2.26)	0.42	0.676	0.09
Working with students who have had good previous experiences with mathematics	6.61 (2.60)	6.13 (2.35)	0.98	0.329	0.20
Having a uniform way of teaching mathematics across the mathematics department	5.52 (2.94)	5.99 (2.66)	-0.85	0.396	-0.17

Note. Items are ordered by mean centrality for the ≤5 year group. Independent-samples t-tests, equal variances assumed, df = 135. d is Cohen's d (pooled SD). Bonferroni-adjusted alpha = .05/60 = .000833; no item reached this threshold. * p < .05 (uncorrected).