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The profile of post-primary mathematics teachers in Ireland

Evidence from PISA 2022

Anastasios Karakolidis, Andrew Keating, Brendan Duggan, Gemma Cherry, and Bróna Laverty

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Preface

The Programme for International Student Assessment (PISA) is a global study conducted by the Organisation for Economic Co-operation and Development (OECD) that assesses the knowledge and skills of 15- and 16-year-olds in the domains of science, reading literacy, and mathematics. In each assessment cycle, one domain is designated as the major area of focus, while the remaining domains serve as minor areas; in PISA 2022, mathematics was the major domain.

In addition to cognitive assessments, PISA gathers extensive background and contextual information through a range of questionnaires. Beyond the international PISA 2022 instruments, mathematics coordinators and teachers in each participating school in Ireland were invited to complete a nationally developed questionnaire. Drawing on data from this national teacher questionnaire, the present report provides an overview of post-primary mathematics teachers in Ireland, their backgrounds and professional profiles, their working life, their views on teaching mathematics, as well as their teaching practices and use of digital resources in Ireland.

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Our sincere gratitude goes to the current and former members of the PISA National Advisory Committee for their guidance, insight, and support throughout the preparation, administration, and reporting of the 2022 cycle.

Finally, and most importantly, we wish to thank everyone who took part in PISA 2022. Particular thanks are due to the School Contacts and Principals who dedicated their time and effort to facilitate PISA testing within schools, and to the mathematics teachers who completed the questionnaire on which this report is based.

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Acronyms and Abbreviations

CBA	Classroom-Based Assessment
CPD	Continuous Professional Development
ERC	Educational Research Centre
OECD	Organisation for Economic Co-operation and Development
PDMT	Professional Diploma in Mathematics for Teaching
PDST	Professional Development Service for Teachers
PIAAC	Programme for the International Assessment of Adult Competencies
PISA	Programme for International Student Assessment
TALIS	Teaching and Learning International Survey
TIMSS	Trends in International Mathematics and Science Study

Chapter 1: Introduction and Context

This chapter provides a brief overview of the Programme for International Student Assessment (PISA), the administration of PISA 2022 in Ireland, as well as key findings in relation to student performance in mathematics, reading, and science. Additionally, the chapter discusses the role of mathematics teachers and presents key findings from the literature in relation to this topic. Finally, the outline of the report is presented.

1.1. What is PISA?

The Programme for International Student Assessment or PISA is an international study which examines the knowledge and skills of 15- and 16-year-olds in the domains of science, reading literacy, and mathematics. The study is an initiative of the Organisation for Economic Co-operation and Development (OECD) and is the largest education study in the world. PISA is a cyclical study which first began in 2000 and takes place every 3 years. In each participating country, a representative sample of students is selected to take part in the study. In 2021, the usual three-year cyclical pattern was interrupted by disruptions caused by the COVID-19 pandemic. Therefore, the main study was delayed by one year and was administered in 2022. Each cycle, one domain is designated the major domain of focus, and the other domains act as minor domains; in PISA 2022, mathematics was the major domain. PISA also collects valuable background and contextual information via a number of questionnaires. An innovative domain is also included in each cycle; in PISA 2022, creative thinking was the innovative domain. In 2022, PISA was administered in 81 participating countries/economies (compared to 79 in the 2018 cycle), including 37 OECD countries, with tests and questionnaires completed by approximately 690,000 students internationally.

1.2. PISA 2022 in Ireland

The first PISA cycle was implemented in 2000, with PISA 2022 being the eighth iteration of the study. Ireland has participated in all PISA cycles. In Ireland, PISA is implemented by the ERC on behalf of the Department of Education and Youth. In 2022, 5,569 students across 170 schools took part, with most students in Transition

Year and Third Year, and smaller proportions in the remaining years.[1] There was a further deviation in the administration of PISA 2022 in Ireland during that cycle, as it was administered in autumn rather than spring. This change was carried out to help reduce the burden on schools, which reported a particularly busy school calendar during the spring.

1.3. PISA 2022 achievement results in Ireland

Overall, Irish students' performance in each domain exceeded that of the OECD averages. In PISA 2022, students in Ireland achieved mean scores in reading, mathematics, and science that were statistically significantly above the corresponding OECD averages. In reading, only Singapore significantly outperformed Ireland, while only nine countries achieved significantly higher mean scores in mathematics and science. Across OECD countries, since 2018, performance has declined significantly in reading and mathematics, with no significant decline in science. In PISA 2022, in Ireland, there was a significant decline in mathematics, no significant change in reading, and a significant increase in science performance, compared to 2018.

As in previous PISA cycles, Ireland had a substantially smaller proportion of students performing at the lowest proficiency levels (i.e., below Level 2) across all three domains compared to the OECD average. However, the proportion of students achieving the highest proficiency levels (i.e., Levels 5 and 6) was generally similar to, or below, OECD averages. For example, in mathematics, 19.0% of Irish students performed below baseline proficiency, compared with an OECD average of 31.1%, while, at the highest levels, 7.2% of students in Ireland reached top proficiency, compared with 8.7% across the OECD. In reading, again, statistically significantly fewer Irish students performed below baseline proficiency (11.4%), compared to the OECD average (26.3%), while 10.3% reached the highest levels, slightly above the OECD average of 7.2%. In science, 15.6% of students in Ireland performed below

[1] The student response rate achieved was 76.8%, which falls below the required minimum response rate of 80%. Consequently, Ireland conducted a Non-Response Bias Analysis. The analysis indicated a likely small upward bias in the achievement estimates for PISA 2022 in Ireland. In other words, the estimates may have been somewhat lower had all selected students participated (Donohue, Perkins, Millar, et al., 2023).

baseline proficiency compared with 24.5% across the OECD, a difference that is statistically significant, while 7.5% of students in Ireland and 7.7% across the OECD, on average, performed at the highest levels.

More detailed information on the implementation of PISA 2022, as well as on findings of the study, can be found in the published national and international reports (e.g., Donohue, Perkins, Walsh, et al., 2023; OECD, 2023a).

1.4. The role of teachers

Of all the school-based resources that form part of the student's learning environment, teachers are the most important (OECD, 2018a, 2021). While there is general agreement that student outcomes vary in part by who their teacher is, there is little consensus on what teacher- and teaching-related factors matter most; isolating the effect of individual teachers at post-primary level is challenging as students have many teachers (Smyth & McCoy, 2011).

There is substantial evidence of a positive relationship between teacher qualification and student performance in mathematics (Wang et al., 2023) and between teachers' mathematical knowledge for teaching and student achievement (Hill et al., 2005), while some studies are equivocal about the importance of qualifications for student achievement more generally (Clotfelter et al., 2006; Palardy & Rumberger, 2008). Wayne and Youngs (2003), in their review of mathematics teaching, found that students progress further in mathematics when taught by teachers with a higher degree of training in mathematics. Outside of mathematics, analysis of PISA 2018 data found that on average across OECD countries, students in schools with a higher proportion of fully qualified teachers tended to score higher in reading (OECD, 2020a). In an Irish context, Cosgrove et al. (2012) found that, even though most mathematics teachers who took part in their study were qualified to teach this subject, a considerable proportion of them lacked sufficient qualifications to do so effectively. In a prior study that specifically examined out-of-field teaching of mathematics in Ireland, Ní Ríordáin and Hannigan (2009) found that nearly half of teachers in their sample did not have a mathematics teaching qualification. More recently, O'Meara and Fitzmaurice (2025) found low levels of confidence in teaching mathematics as well as of mathematical knowledge gaps among a sample of out-of-field teachers of mathematics in Ireland. Goos et al. (2023) discussed the introduction of a Professional Diploma in Mathematics for Teaching (PDMT) to address out-of-field teaching in the subject, finding a substantial reduction in the proportion of mathematics teachers without sufficient training as mathematics teachers since the inception of the programme.

Teacher professional development has been identified as a key pillar of teacher professionalism (OECD, 2020a). While that report of the PISA 2018 cycle found only a weak relationship between professional development activities and student performance in reading overall, it noted that in-service development activities were one of three factors common to countries with high performance in student outcomes. Continuous professional learning is noted as playing an important role for teaching in the era of digital education, by providing a pathway to updating teachers' knowledge and skills in digital technology, and drawing attention to both its risks and use as a pedagogical tool (OECD, 2025b). This study, based on analysis of PISA 2022 cycle data, found that, notwithstanding a very substantial increase in the use of digital technologies compared to pre-COVID-19 pandemic levels, large gaps in skills for integrating digital technologies into pedagogical approaches persisted. However, this gap was much less pronounced in Ireland compared to the OECD average.

Evidence for a relationship between years of teaching experience and student outcomes is mixed (Clotfelter et al., 2006; Day & Gu, 2007; Graham et al., 2020; Nye et al., 2004; Palardy & Rumberger, 2008), with substantial methodological issues eroding the scope for clear conclusions. The OECD (2020a) found that students learning in an environment of full-time teachers tend to perform better, on average, than non-full-time teachers, and that students taught by more experienced teachers tended to have better results in the PISA science assessment, after accounting for confounding factors such as socio-economic and demographic differences (OECD, 2018b). However, the latter notes that the finding may be attributable to less experienced teachers being placed in more challenging schools in some countries. A number of the studies cited above found little or no evidence for a relationship between teacher experience and student outcomes.

Teacher well-being, as measured by factors such as job satisfaction and work-life balance, affects teacher-student relationships in the classroom, while students who feel supported by their teachers in mathematics tend to report higher mathematics scores (OECD, 2025a). Higher teacher satisfaction may lead to better student performance arising from enhanced teacher commitment (OECD, 2020b). In Ireland, while more than half of students have consistently been taught by teachers who were very satisfied with their jobs, overall, teacher job satisfaction has declined over time at both the primary and post-primary levels (Pitsia et al., 2025). Conversely, teacher stress and perception of a stressful working environment may affect teaching quality, teacher self-efficacy, and motivation, while lower job satisfaction is associated with higher student behavioural problems (OECD, 2020b). OECD’s Teaching and Learning International Survey (TALIS), the largest international survey of teachers and principals, highlighted the importance of feeling valued, as teachers who feel valued by their communities are more motivated, and committed (OECD, 2025a). In Ireland, Smyth (1999) found student school attendance to be higher among students who reported positive teacher relationships.

Teachers’ classroom practices is a multi-dimensional topic, and includes classroom management, teacher support, clarity of instruction, and feedback to students (Ainley & Carstens, 2018), and may explain a substantial proportion of differences in student outcomes (OECD, 2021). The amount of classroom time dedicated to academic instruction is closely linked with student learning, and is also related to classroom disciplinary environment and associated management skills (Muijs et al., 2014). Based on data from the 2008 TALIS cycle for Ireland, Gilleece et al. (2008) found that the classroom disciplinary environment in Irish schools was more positive than average, something also supported by more recent PISA data (OECD, 2023b), and the amount of classroom time dedicated to teaching was similar, compared to a basket of 24 countries.[2] That study also found that teachers in Ireland were more likely to adopt a teacher-led structured approach in the classroom compared to peer countries, among whom student-centred approaches tended to be more prevalent. Variation by subject area was also evident in the study, with mathematics more likely to be taught using teacher-led practices compared to other subjects. Perkins and Shiel (2016) noted that a synthesis of the evidence suggests differential approaches

[2] Ireland took part in TALIS 2008. Since then, the country participated in TALIS Starting Strong 2024 only, an international, large-scale survey of staff and leaders in early learning and care.

to teaching mathematics may be optimum for improving performance among both lower and higher achieving students in mathematics.

1.5. Outline of the report

In light of the above recognising the important role of teachers, this report aims to provide an overview of post-primary mathematics teachers in Ireland. It draws on mathematics teachers' self-reported information in a number of different areas, including teaching qualifications and experience (with particular emphasis on mathematics), employment status and teaching time, approaches to teaching mathematics, as well as teachers' views and opinions on matters related to their training and their teaching. It should be noted that this report presents teachers' profiles based on data collected in autumn 2022, in the aftermath of the COVID-19 pandemic and following an extended period of school closures and remote teaching. The report is divided into six chapters. Chapter 2 addresses methodological matters, Chapters 3 to 5 present the results of the analysis, and Chapter 6 provides a summary and discussion of the key findings.

Chapter 2: Methodology

This chapter discusses the instruments, sample, and analysis techniques used for the purposes of this report.

2.1. Data collection instruments

To gain a multifaceted understanding of the characteristics of education systems, schools, teachers, students and their families, as well as the factors that can contribute to student academic achievement, several questionnaires are administered each PISA cycle. Ireland administered the international student and school questionnaires, as well as the optional parent questionnaire. In addition, mathematics coordinators and teachers in each participating school were each asked to complete a nationally developed questionnaire.[3] The teacher questionnaire, the results of which are presented in this report, delves into mathematics teachers' background, their working life, their views on teaching mathematics, as well as their teaching practices and use of digital resources.[4]

2.2. Sample

Approximately 1,600 mathematics teachers from the 170 post-primary schools that took part in PISA were invited to complete the national teacher questionnaire. In total, 953 teachers from 134 schools completed the questionnaire either partially or in full. Table 1 presents the sample by school sector and DEIS status. Despite the high engagement of teachers with this questionnaire, the achieved teacher- (58.3%) and school-level (78.8%) response rates[5] do not allow us to claim that this is a representative sample of post-primary mathematics teachers in Ireland. Additionally, given that this is a national questionnaire developed specifically for the Irish context, comparisons with teacher data from other countries participating in PISA are not possible.

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[3] International questionnaires are administered across all participating countries, while national questionnaires may be developed and administered individually within each country.
[4] The data collected from mathematics coordinators are not presented in this report.
[5] The response rates reported here are unweighted.

Table 1 – School and teacher sample, by sector and DEIS status (unweighted)

	PISA 2022 overall sample		PISA 2022 mathematics teacher questionnaire sample			
	Schools		Schools		Teachers	
	n	*%*	*n*	*%*	*n*	*%*
Sector						
Girls Secondary	30	17.6	18	13.4	143	15.0
Boys Secondary	27	15.9	21	15.7	155	16.3
Mixed Secondary	32	18.8	25	18.7	179	18.8
Community/Comprehensive	28	16.5	25	18.7	177	18.6
Vocational (ETB)	53	31.2	45	33.6	299	31.4
Total	170	100.0	134	100.0	953	100.0
DEIS status						
Non-DEIS	133	78.2	108	80.6	790	82.9
DEIS status	37	21.8	26	19.4	163	17.1
Total	170	100.0	134	100.0	953	100.0

2.3. Analysis and reporting

As outlined earlier, this report aims to provide an overview of post-primary mathematics teachers' background and profile, their working life, their views on teaching mathematics, as well as their teaching practices and use of digital resources in Ireland. Therefore, the analysis is limited to descriptive statistics, which summarise and present the data (e.g., frequencies, percentages, or averages). Inferential statistics, which are used to draw conclusions regarding the relationship between two or more variables or make generalisations beyond the sample, are not applied. Also, it should be noted that the report focuses on teachers' responses without links to student performance in PISA.

In the main text of this report, response options, categories, and groups are often combined to facilitate the presentation of results. Percentages below 5.0% are not presented in the figures in some cases. More detailed estimates, along with information on missing data for each question, are provided in the Appendix. Please note that, due to rounding, some of the percentages may not sum to exactly 100%.

Chapter 3: Teachers' Background and Experience

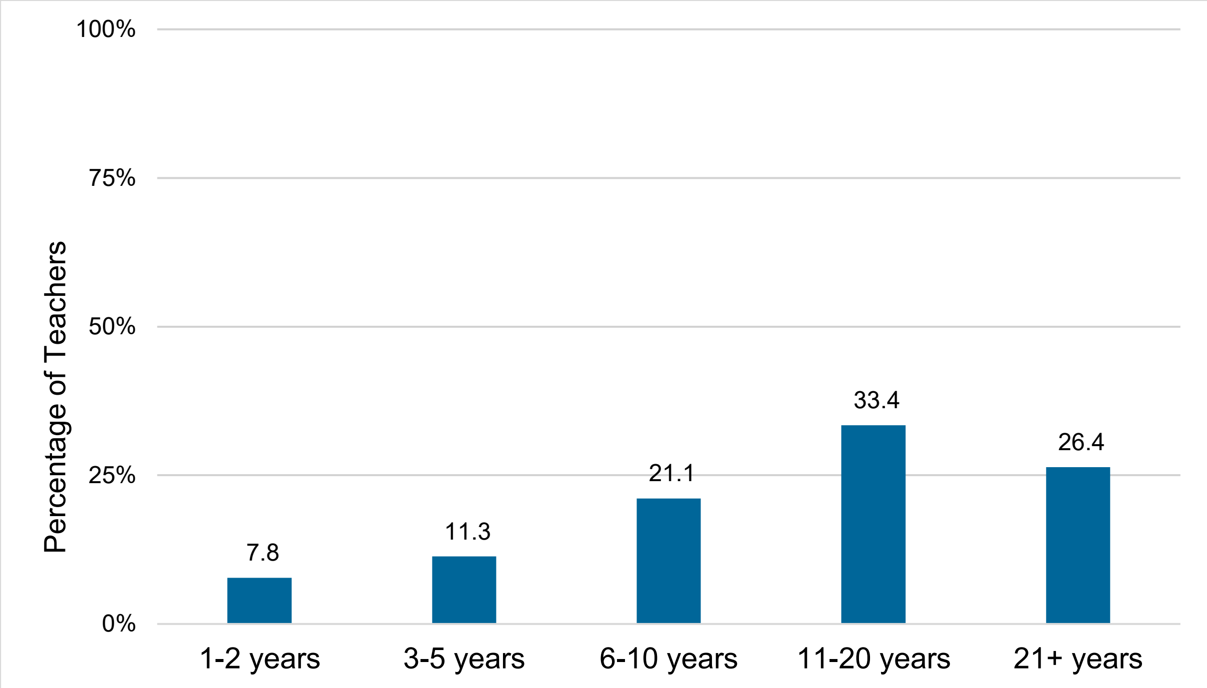
This chapter outlines the teaching experience and qualifications of the post-primary mathematics teachers from the sample of 953 who completed the national teacher questionnaire in PISA 2022. It describes the teaching-related qualifications they have attained at both undergraduate and postgraduate level, with specific focus on the mathematics component, while also providing information on types and quantity of continuous professional development they have undertaken. The last section shows the results for teachers' views of the adequacy of their teacher training in preparing them for teaching mathematics.

3.1. Teachers' gender and teaching experience

The majority of teachers who completed this PISA 2022 national questionnaire reported their gender as female (60.9%, *n* = 580), with less than two in five reporting as male (38.7%, *n* = 368). Three identified as non-binary (0.3%) and one reported their gender as not listed above (see Table A1 in the Appendix).

As shown in Figure 1, most teachers had more than 10 years of teaching experience (59.8%, *n* = 569), with the largest group overall having between 11 and 20 years (33.4%, *n* = 318). About one in five (21.1%, *n* = 201) reported having between 6 and 10 years of teaching experience. Less than one in five reported having 5 years or less teaching experience, with 11.3% (*n* = 108) reporting between 3 and 5 years of experience and 7.8% (*n* = 74) reporting having up to 2 years.

Figure 1 – Length of teaching time

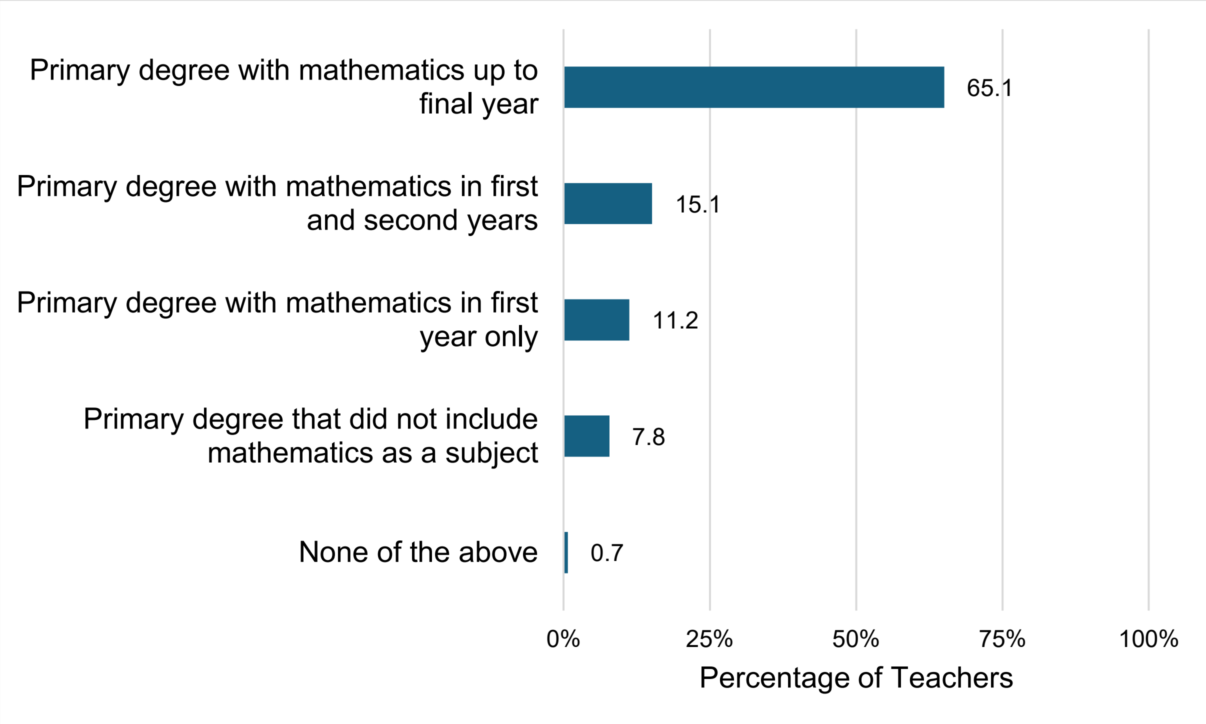


Note. See Table A2

3.2. Teachers' qualifications

Most teachers reported holding a primary degree with at least some element of mathematics (91.4%, *n* = 864). As shown in Figure 2, almost two-thirds (65.1%, *n* = 615) reported holding a primary degree that included mathematics up to their final year. A further 15.1% (*n* = 143) studied mathematics in the first and second years of their degree, while 11.2% (*n* = 106) took mathematics in their first year only. A smaller proportion (7.8%, *n* = 74) indicated that their degree did not include mathematics as a subject. Most teachers (81.9%, *n* = 759) also reported having studied mathematics teaching methods as part of their teacher preparation (see Table A3 in the Appendix).

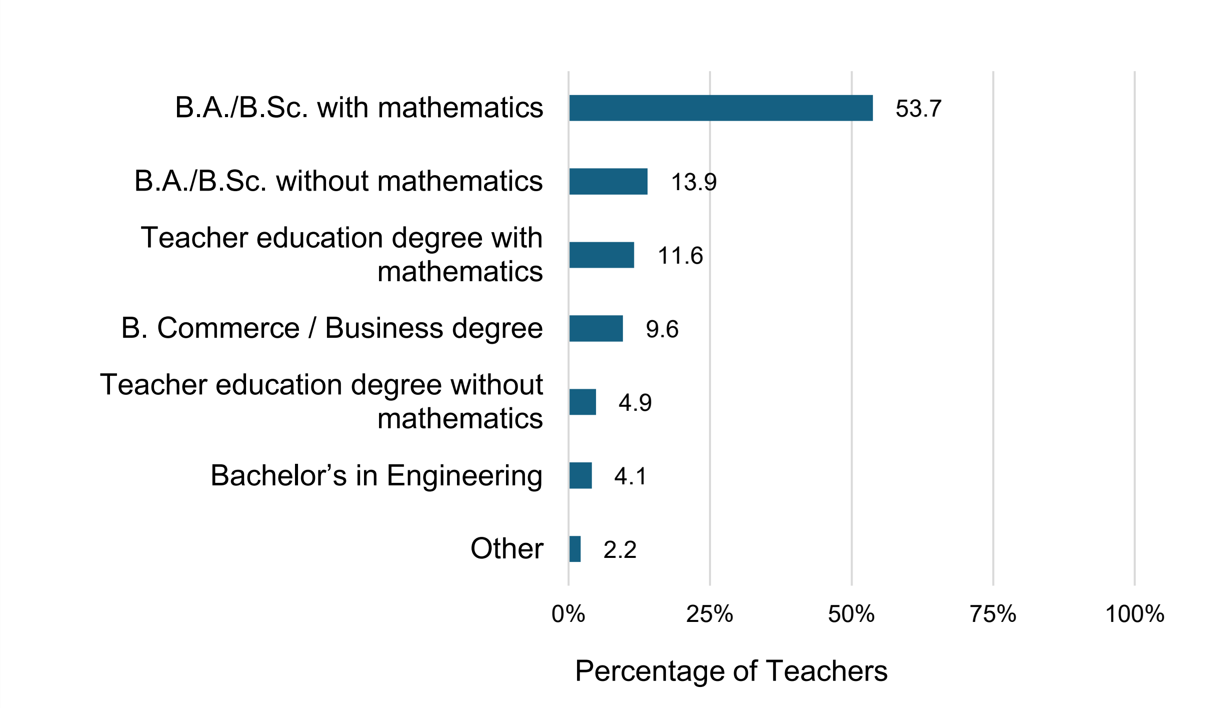
Figure 2 – Types of undergraduate qualifications with a mathematics component



Note. See Table A4

More specifically, as shown in Figure 3, over half of respondents (53.7%, *n* = 497) held a Bachelor of Arts or Bachelor of Science degree with mathematics, while 13.9% (*n* = 129) attained these degrees without mathematics. About one in 10 (11.6%, *n* = 107) had teacher education degrees with mathematics, and a further 4.9% (*n* = 45) attained these degrees without a mathematics component (see figure 3). One in 10 (9.6%, *n* = 89) indicated that they had a Bachelor of Commerce or Business degree, while 4.1% (*n* = 38) reported that they had a Bachelor's degree in Engineering. A smaller number (2.2%, *n* = 20) reported attaining other undergraduate qualifications.

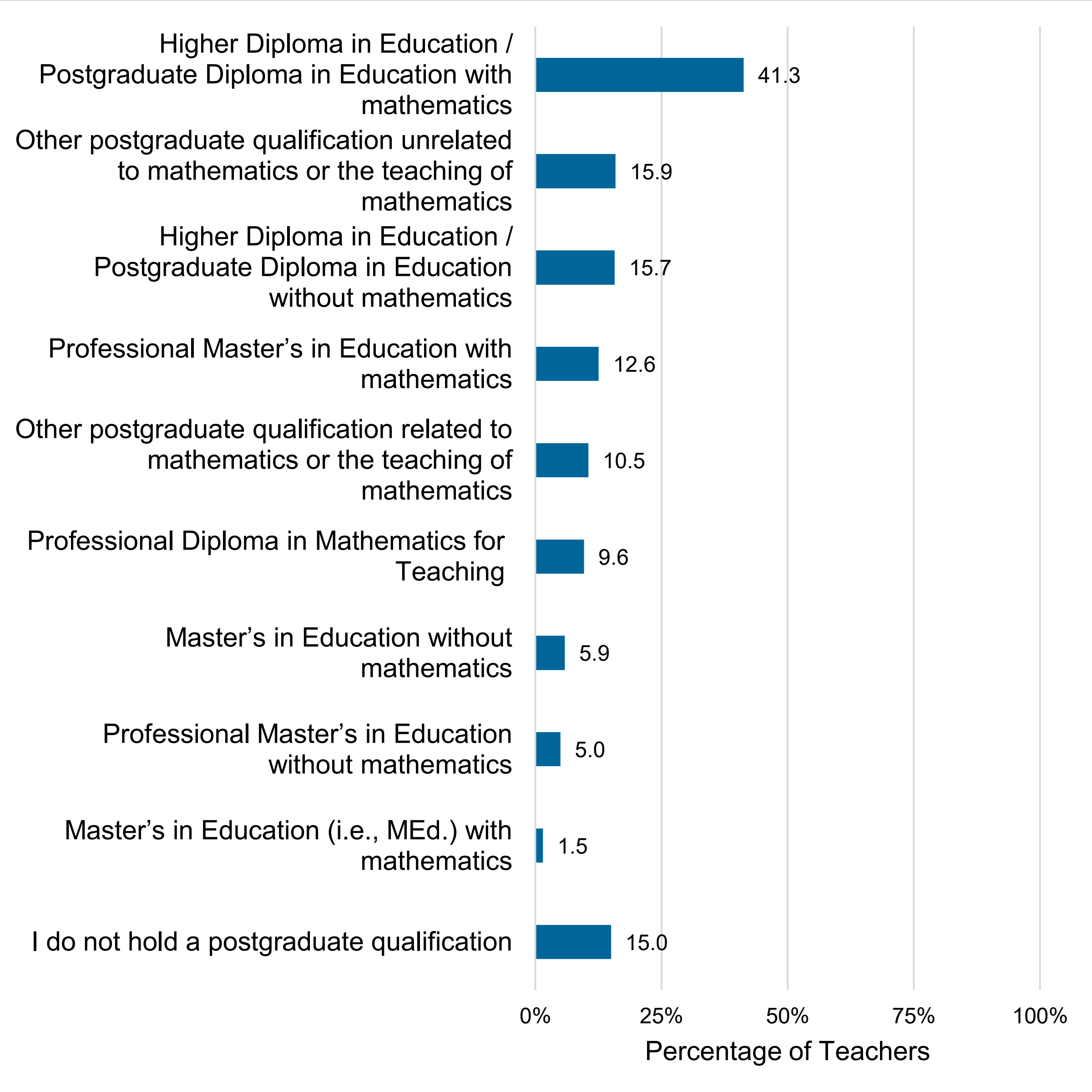
Figure 3 – Types of undergraduate qualifications



Note. See Table A5

Teachers were asked about the type of postgraduate qualifications they had attained, noting that some hold multiple qualifications; 85.0% (*n* = 815) had at least one qualification. As shown in Figure 4, two in five respondents indicated they held a Higher Diploma in Education/Postgraduate Diploma in Education with mathematics (41.3%, *n* = 381), and a further 15.7% (*n* = 145) reported that same qualification without mathematics. The next most frequent qualification was Professional Master's in Education; 12.6% (*n* = 116) reported this with mathematics and 5.0% (*n* = 46) without. 9.6% (*n* = 89) hold a Professional Diploma in Mathematics for Teaching. A smaller proportion of teachers reported holding a Master's in Education; 1.5% (*n* = 14) with a focus on mathematics and 5.9% (*n* = 54) without. Nearly one in four reported holding another postgraduate qualification, with 10.5% (*n* = 97) related to mathematics or the teaching of mathematics and 15.9% (*n* = 147) unrelated to these. Among those who responded, 56.7% (*n* = 540) indicated that they had only one postgraduate qualification, 20.4% (*n* = 194) indicated that they had two, while 5.3% (*n* = 51) reported that they had three or more postgraduate qualifications.

Figure 4 – Types of postgraduate qualifications

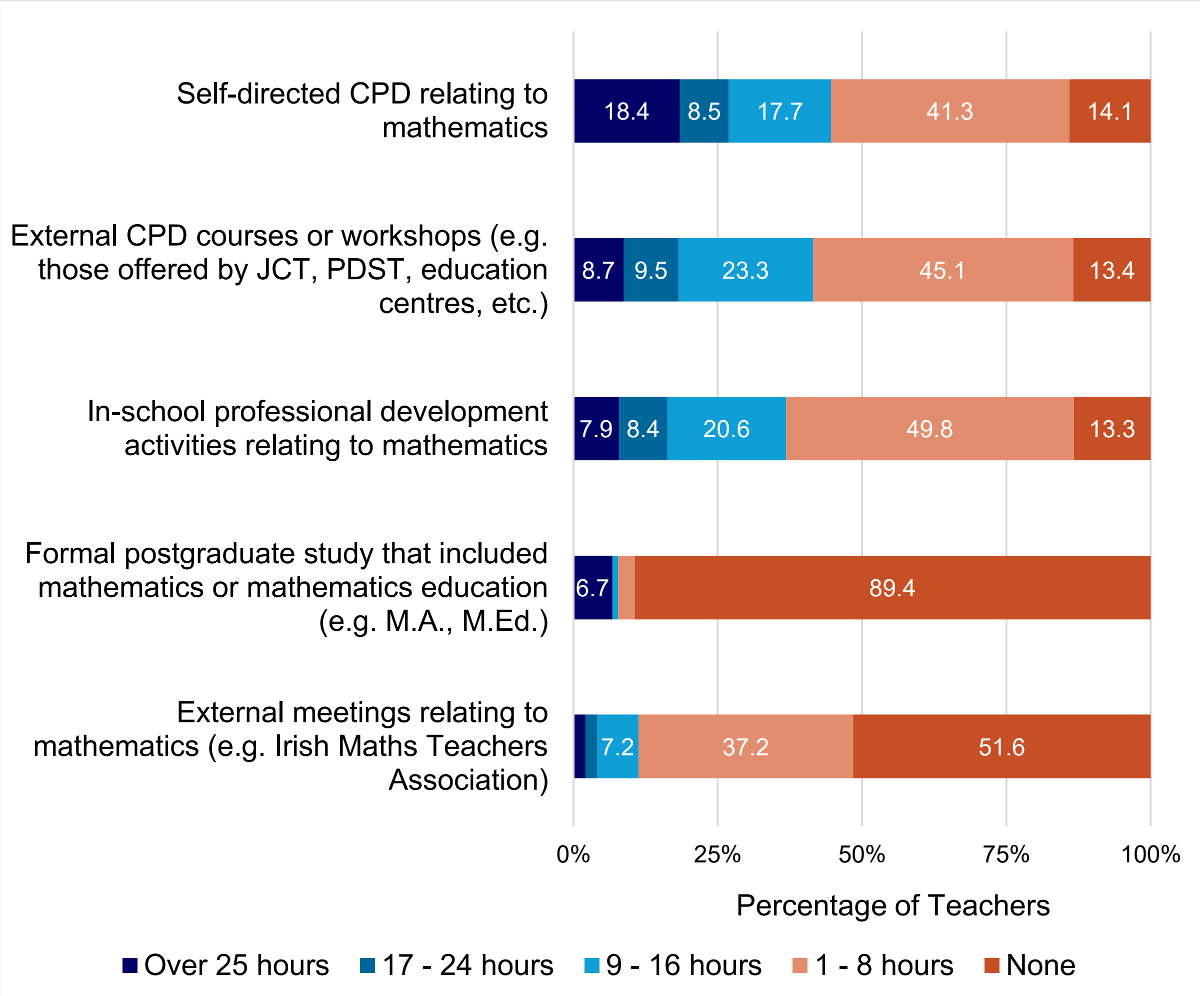


Note. See Table A6

3.3. Continuous professional development

Respondents were asked about the extent to which they engaged in Continuous Professional Development (CPD) during or outside school time in the past 3 years in five discrete areas. Figure 5 shows that for three of these areas, the most commonly reported answer was between 1 and 8 hours (for in school professional development activities relating to mathematics, 49.8% (*n* = 468) of teachers reported this; for self-directed CPD relating to mathematics, 41.3% (*n* = 388) did so; while for external CPD courses or workshops, 45.1% (*n* = 424) reported this number of hours). In the two other areas that respondents were asked about, the majority reported that they had not undertaken any CPD hours; for external meetings relating to mathematics, 51.6% (*n* = 481) reported none undertaken, while for formal postgraduate study that included mathematics or mathematics education 89.4% (*n* = 833) reported this. Less than one in ten respondents indicated that they had undertaken more than 25 hours CPD in each of the areas, except self-directed CPD relating to mathematics, where nearly one in five (18.4%, *n* = 173) reported more than 25 hours in the last three years.

Figure 5 – CPD engaged in the past three years, during or outside school hours

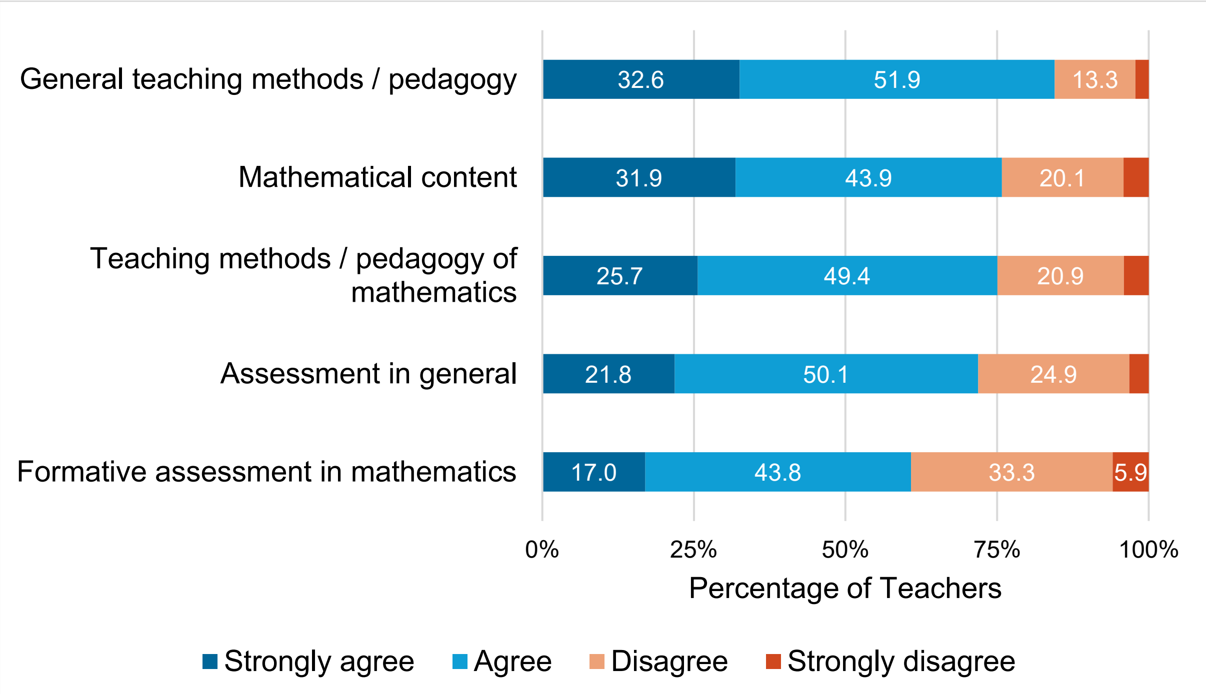


Note. See Table A7

3.4. Views on the adequacy of aspects of qualifications in preparation for the teaching of mathematics

When asked to consider the adequacy of the mathematical content of their qualifications for teaching mathematics (see Figure 6), three out of four agreed or strongly agreed (75.8%, *n* = 680) that it was adequate. The results were similar when respondents were asked about the teaching methods of mathematics, with three in four (75.1%, *n* = 661) reporting they either agreed or strongly agreed that this was adequately covered in their studies. More than four out of five teachers agreed or strongly agreed (84.5%, *n* = 773) that general teaching methods (pedagogy) of their qualifications were adequate. With respect to assessment in general, 71.9% of teachers (*n* = 655) agreed or strongly agreed that this was adequate, but nearly one quarter disagreed (24.9%, *n* = 227). A lower proportion agreed that aspects related to formative assessment in mathematics were adequate for preparing them to teach mathematics to post-primary students, with nearly two in five disagreeing or strongly disagreeing (39.2%, *n* = 344).

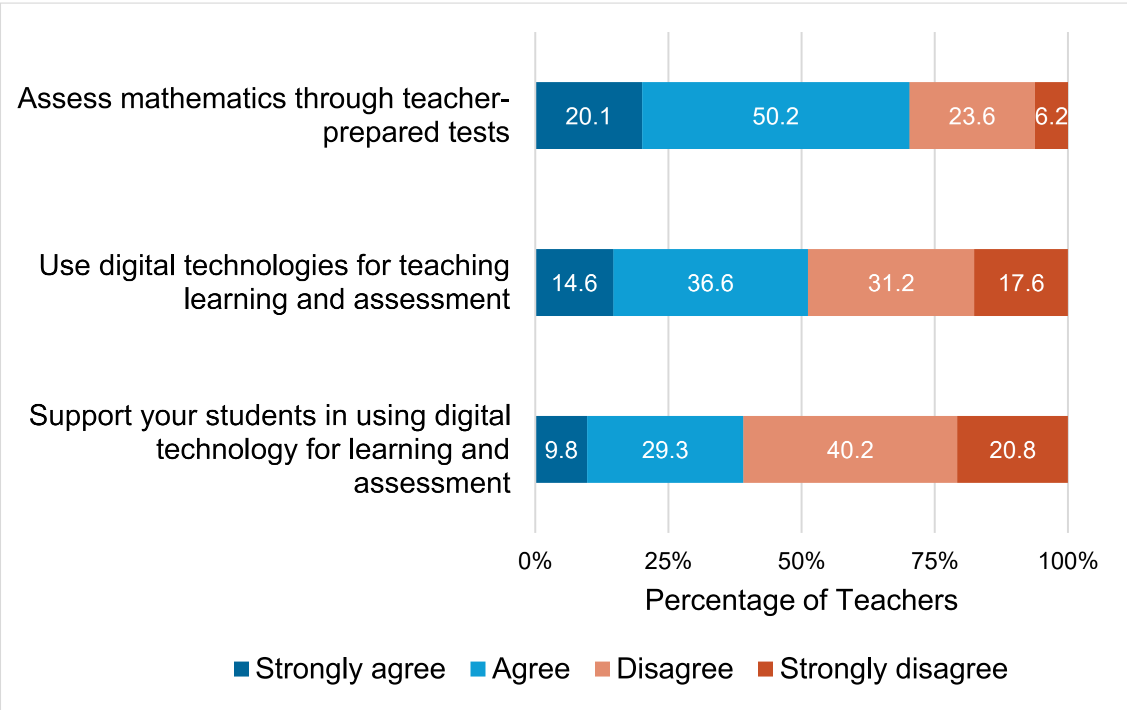
Figure 6 – Adequacy of aspects of qualifications in preparation for the teaching of mathematics to post-primary students



Note. See Table A8

Teachers were also asked about the extent to which their qualifications and teacher education prepared them to teach mathematics (see Figure 7). Most teachers who responded agreed or strongly agreed (70.2%, *n* = 620) that their teacher education prepared them to assess mathematics through teacher-prepared tests. There was no consensus among respondents on whether they had been adequately prepared for use of digital technologies for learning and assessment; slightly more than half agreed or strongly agreed (51.1%, *n* = 461), while almost half disagreed or strongly disagreed (48.8%, *n* = 430*)*. The majority of teachers disagreed or strongly disagreed (61.0%, *n* = 531) that their teacher education adequately prepared them to support their students in using digital technology for learning and assessment.

Figure 7 – Adequately prepared for aspects of teacher education for teaching mathematics



Note. See Table A9

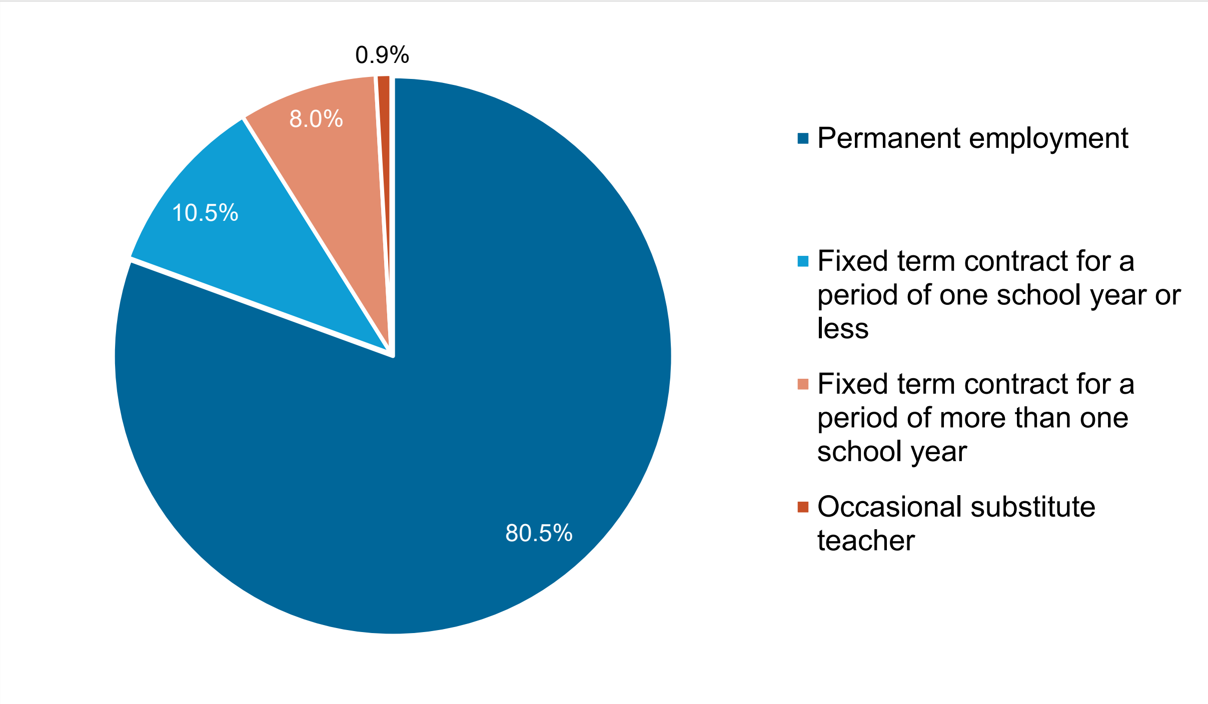
Chapter 4: Teachers' Working Life

This chapter provides an overview of teachers' employment patterns and teaching responsibilities. The first section examines employment status and working hours. The second section focuses on teaching workload, covering weekly hours spent teaching mathematics, overall teaching commitments, and the levels at which Junior Cycle mathematics were taught.

4.1. Employment and working hours

As shown in Figure 8, teachers' responses in relation to their employment status indicate that the majority of them held permanent positions (80.5%, *n* = 765). A smaller proportion were employed on fixed term contracts, with 8.0% (*n* = 76) contracted for more than one school year and 10.5% (*n* = 100) for one school year or less. Only 0.9% (*n* = 9) of the teachers who took part in the study reported working as occasional substitute teachers. Most teachers said they were employed full-time (91.9%, *n* = 843), while a smaller group (8.1%, *n* = 74) reported working part-time (see Table A10 in the Appendix).

Figure 8 – Teachers' employment status

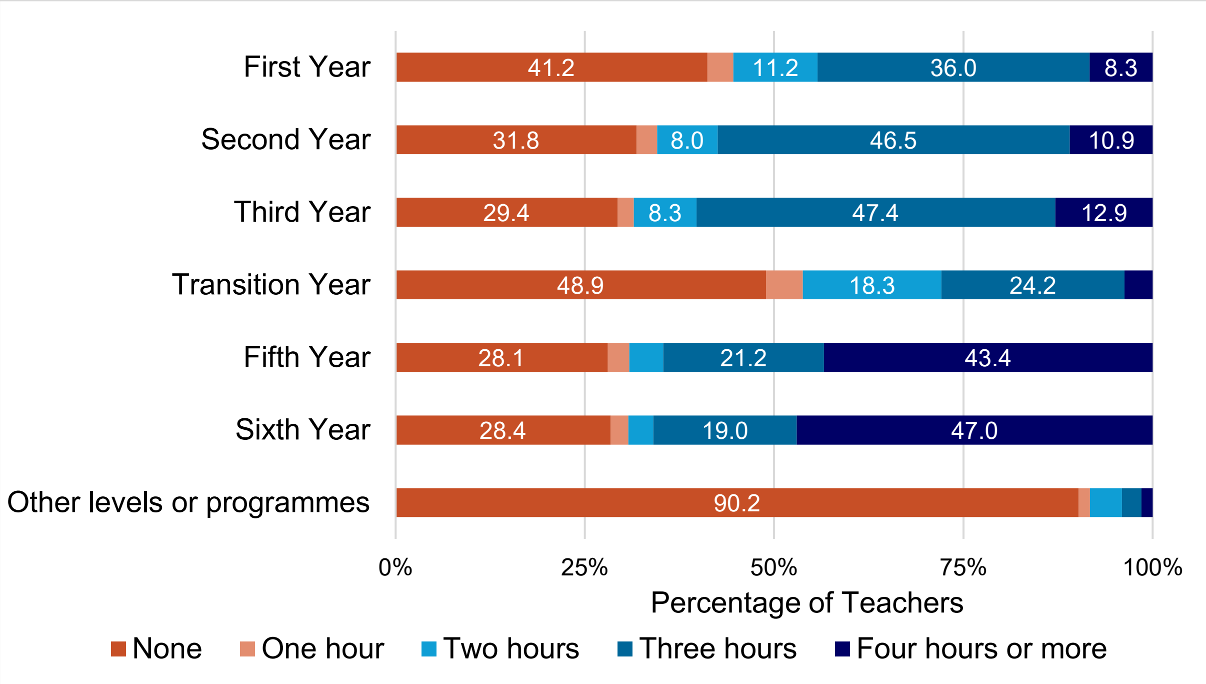


Note. See Table A11

4.2. Teaching workload

There is a variation in the number of hours per week that teachers said they spent teaching mathematics across different year groups (see Figure 9). Across all year groups, mathematics teaching was typically reported to be for 3 or more hours per week, with relatively few reporting 2 hours or less. Many teachers reported having no mathematics teaching for certain year groups. Transition Year and other programmes featured less often in teachers' mathematics teaching schedules, with core Junior and Senior Cycle years accounting for the bulk of reported teaching time.

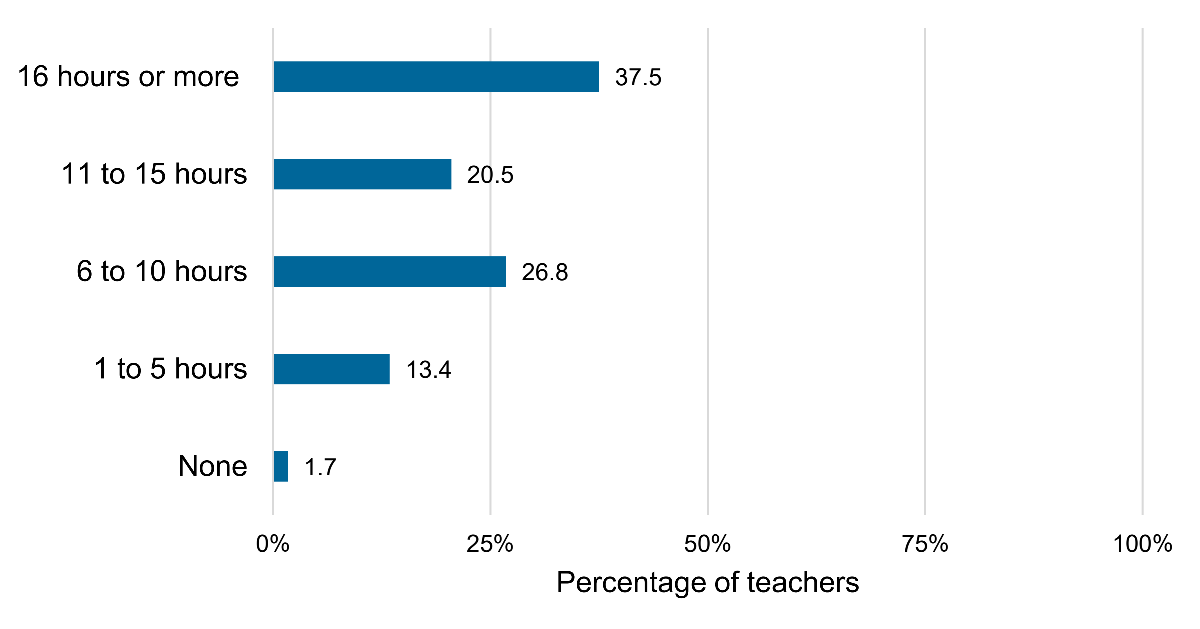
Figure 9 – Weekly hours spent teaching mathematics across year groups



Note. See Table A12

In terms of total hours spent teaching mathematics per week, over a third of teachers (37.5%, *n* = 351) reported teaching 16 hours or more, and a further 20.5% (*n* = 192) 11 to 15 hours (see Figure 10). About one in four (26.8%, *n* = 251) taught 6 to 10 hours. A small number of teachers (1.7%, *n* = 16) indicated that they did not have any mathematics teaching commitments at the time that the questionnaire was administered.

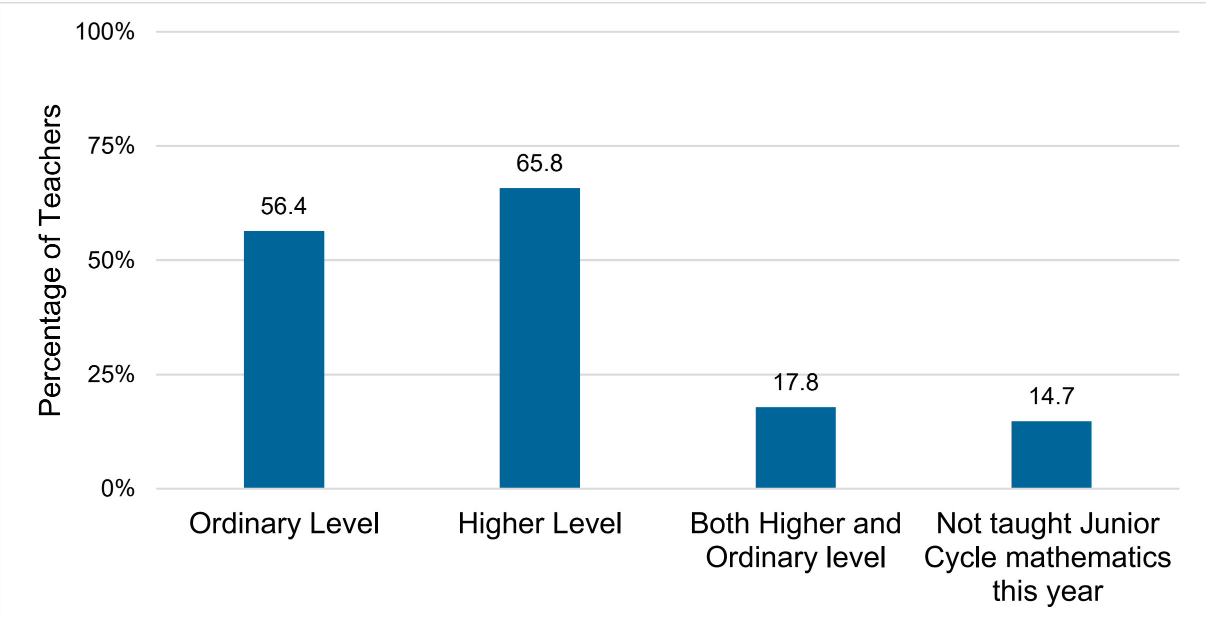
Figure 10 – Weekly hours spent teaching mathematics across all year levels



Note. See Table A13

Among teachers, Junior Cycle mathematics was reported as being predominantly taught at Higher Level (65.8%, *n* = 627), with a slightly smaller proportion teaching Ordinary Level (56.4%, *n* = 535). A total of 17.8% (*n* = 232) of teachers reported teaching at both Higher and Ordinary Levels. A small proportion of teachers (14.7%, *n* = 140) reported not teaching Junior Cycle mathematics this year (see Figure 11).

Figure 11 – Levels teachers taught Junior Cycle mathematics in this academic year



Note. See Table A14

Chapter 5: Approaches to Teaching Mathematics

The following sections focus on teaching mathematics at different year groups in post-primary schools. Teachers were asked about different aspects of teaching at Junior Cycle and Senior Cycle, and how they compare. Teachers provided information about the teaching of mathematics in Third and Transition Year. Finally, they described the types of resources used in mathematics classes across all levels.

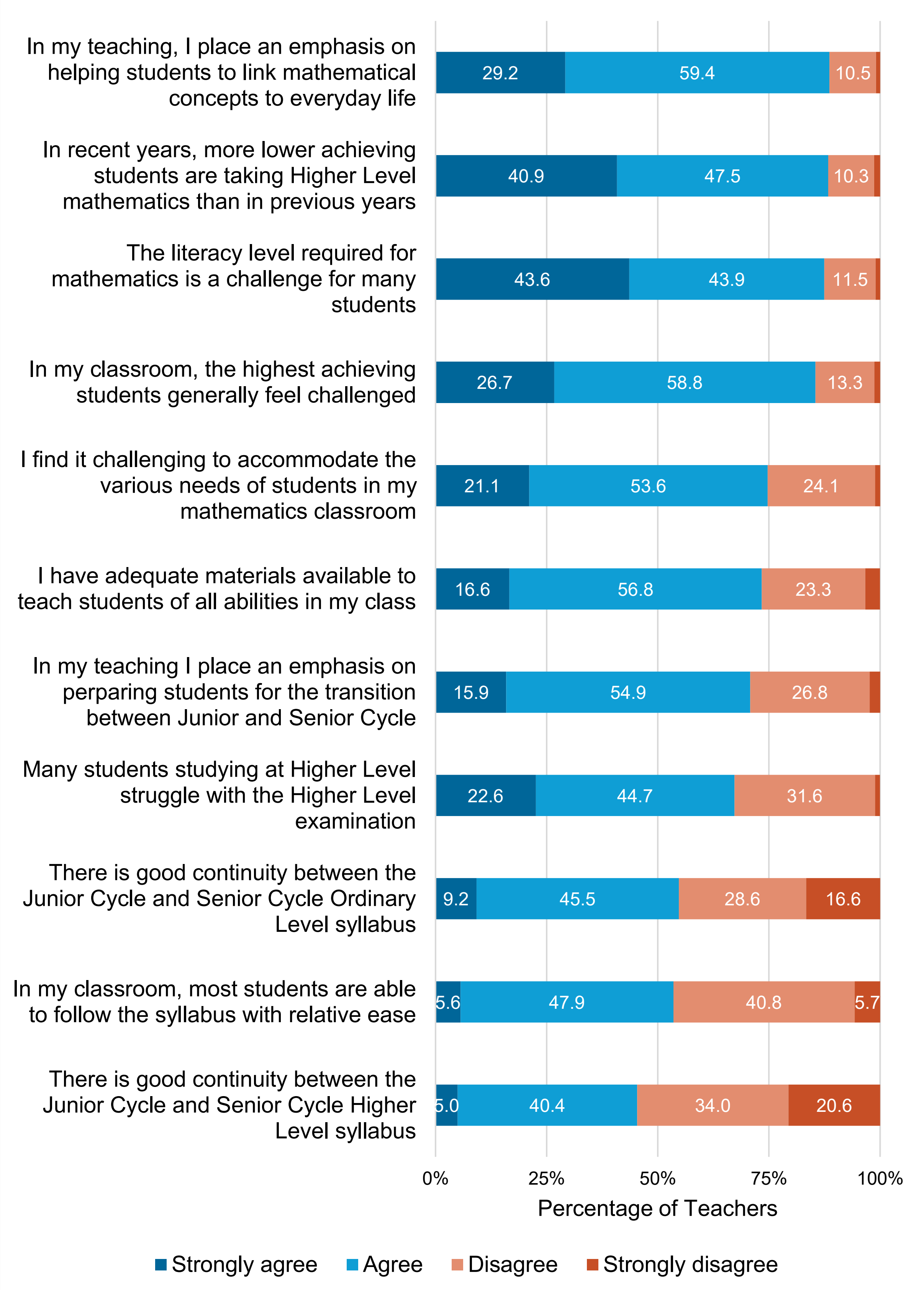
Teachers were asked not to respond to a question if they did not teach at that level. As a result, the number of cases varies in the following sections.

5.1. Junior Cycle teaching

At Junior Cycle level, 87.5% (*n* = 684) of teachers agreed or strongly agreed that the literacy level required in mathematics classes is a challenge for students (see Figure 12). About 88% of teachers agreed or strongly agreed that more lower-achieving students are taking Higher Level mathematics in recent years (88.4%, *n* = 642). Also, over two-thirds of teachers (67.3%, *n* = 474) agreed or strongly agreed that many students in Higher Level mathematics struggle with the Higher Level examination. The majority of teachers (73.4%, *n* = 574) agreed that they have adequate materials to teach students of all abilities, they also reported that they found it challenging to accommodate the various needs of students in their mathematics lessons (74.7%, *n* = 585).

Teachers' opinions were split over whether there was good continuity between the Junior Cycle and Senior Cycle syllabus at Ordinary and Higher Level. About half of teachers agreed or strongly agreed that there was good continuity between the Junior Cycle and Senior Cycle; 54.7% (*n* = 398) for Ordinary Level and 45.4% for Higher Level (*n* = 319). Most teachers (88.6%, *n* = 692) were in agreement that they try to place an emphasis on helping students to link mathematical concepts to everyday life. However, there was a lower level of agreement with the statement that most students are able to follow the syllabus with relative ease (53.5%, *n* = 420).

Figure 12 – Teachers' views about teaching mathematics at Junior Cycle level



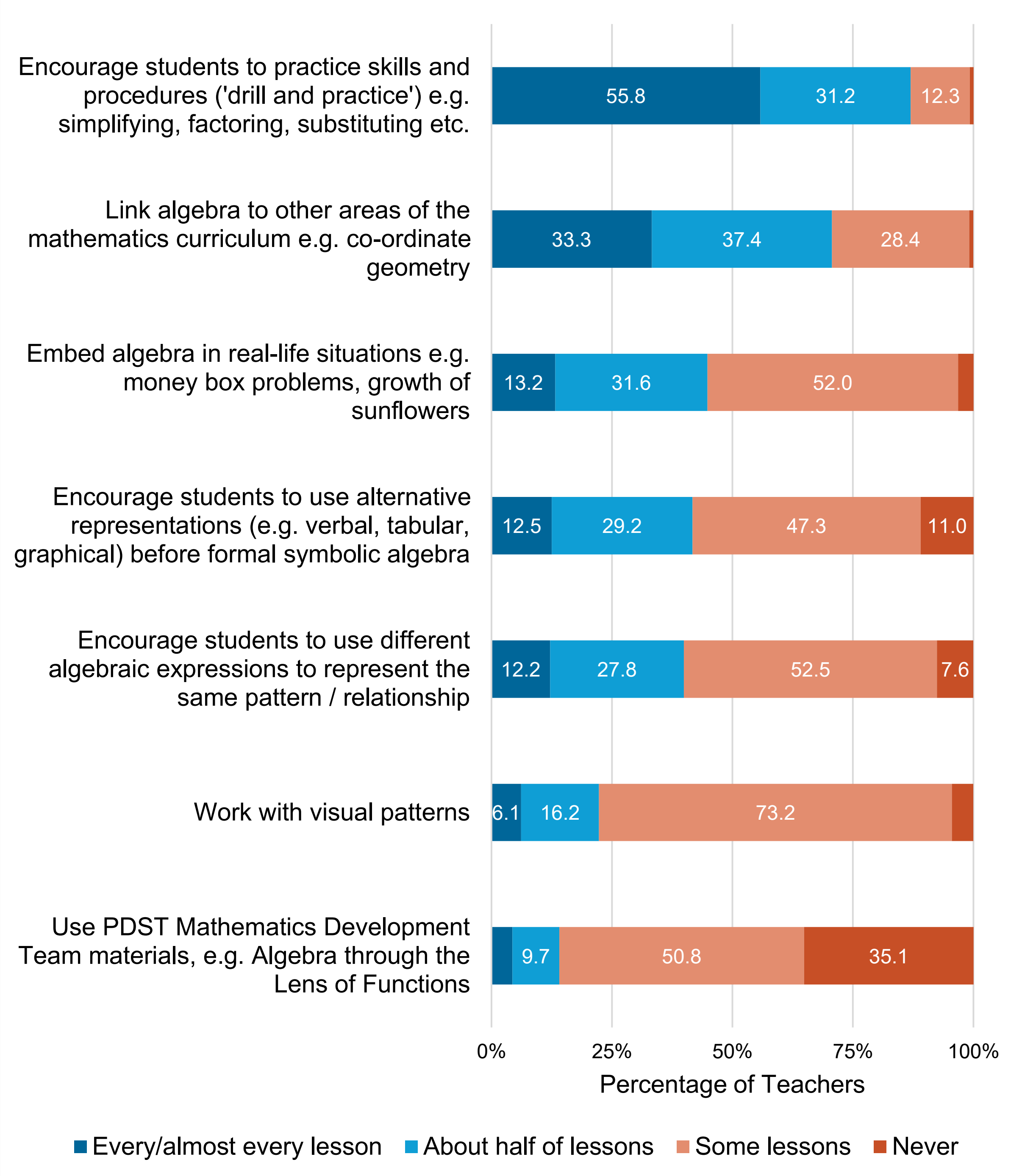
Note. See Table A15

5.1.1. Activities in algebra classes

Figure 13 shows that in algebra classes, only 3.2% (*n* = 25) of teachers reported that they never embedded algebra in real-life situations, while 44.8% (*n* = 349) integrated real-life situations into half, or every, algebra lesson. Most teachers (99.2%, *n* = 777) reported that they encouraged students to practice skills and procedures in at least some of their lessons; 55.8% (*n* = 437) reported doing so in every or almost every lesson. Similarly, almost all teachers (99.1%, *n* = 777) linked algebra to other areas of the mathematics curriculum in at least some of their lessons; 33.3% (*n* = 261) reported doing so in every or almost every lesson.

In at least half of their lessons, two-fifths of teachers encouraged students to use different algebraic expressions (40.0%, *n* = 312) or alternative representations (41.7%, *n* = 327) to portray the same relationship. One-fifth of teachers worked with visual patterns in at least half of their lessons (22.3%, *n* = 175). Resources such as materials from the Professional Development Service for Teachers (PDST, now known as Oide) were never used by over a third of teachers in their Junior Cycle algebra lessons (35.1%, *n* = 274).

Figure 13 – Frequency of activities in algebra classes at Junior Cycle

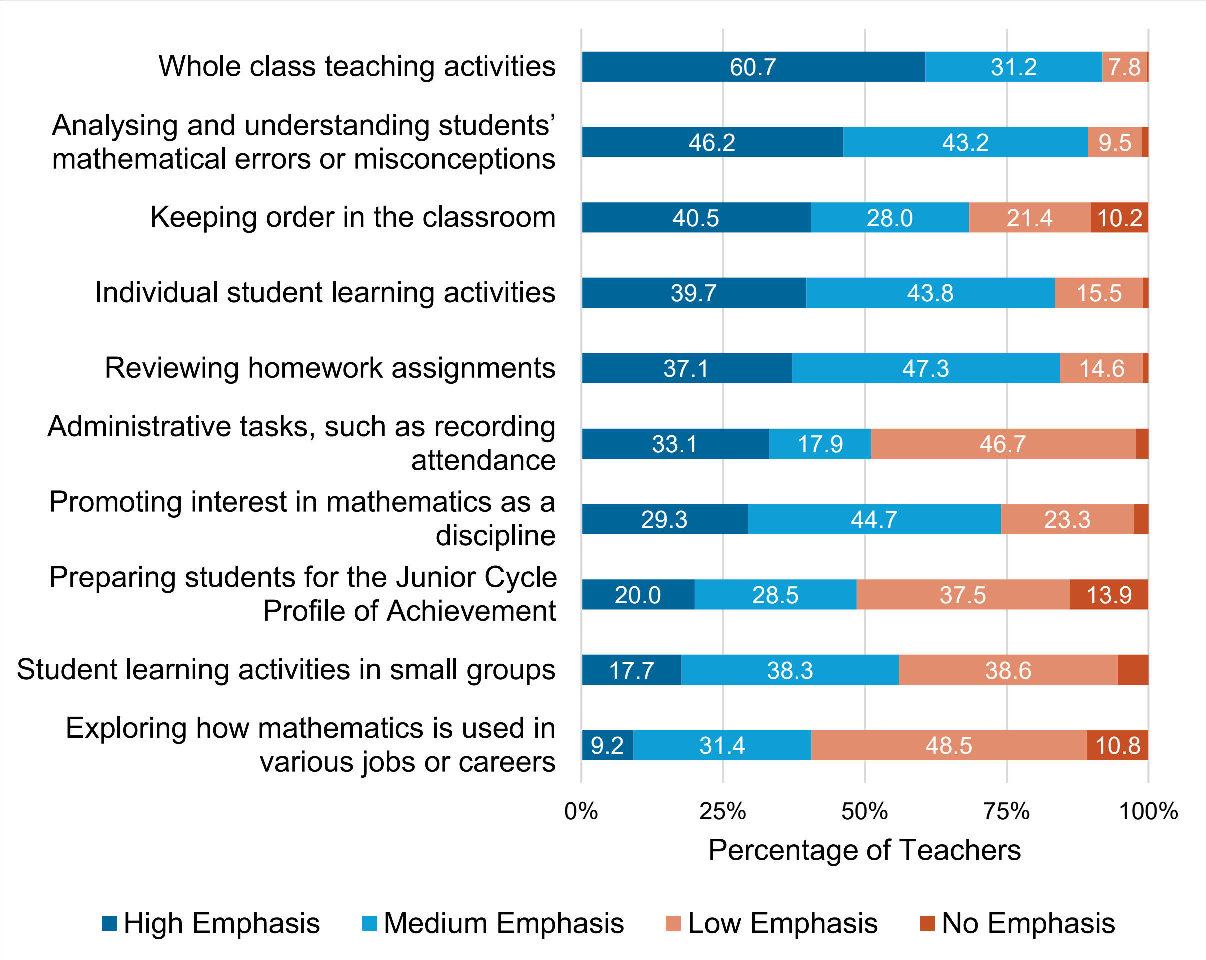


Note. See Table A16

5.1.2. Teaching Third Year students

Teachers were asked how much emphasis they placed on different activities in Third Year mathematics classes in a typical week. Teachers who did not teach at Third Year were instructed to skip this question, while the responses of those who did are presented below and in Figure 14. Almost all teachers placed emphasis on whole-class teaching activities in some form (99.7%, *n* = 616), with 60.7% (*n* = 375) of them placing a high level of emphasis on this. Approximately, two-fifths of teachers placed a high emphasis on individual learning activities (39.7%, *n* = 243), analysing and understanding students' errors or misconceptions (46.2%, *n* = 287), and reviewing homework assignments (37.1%, *n* = 229). In contrast, student learning activities in small groups was not as emphasised by teachers, with two in five teachers placing a low emphasis on this in their mathematics classes weekly (38.6%, *n* = 238) and 5.4% (*n* = 33) of teachers placing no emphasis on this. Administrative tasks such as recording attendance were also of low emphasis to almost half of the teachers (46.7%, *n* = 289), although, for a third of the teachers, this was emphasised at a high level (33.1%, *n* = 205). Two in five teachers (40.5%, *n* = 250) placed a high level of emphasis on keeping order in the classroom every week, but 10.2% (*n* = 63) of teachers placed no emphasis on this. Less emphasis was placed on two activities, with three in five teachers reported that they placed low or no emphasis on exploring how mathematics is used in various jobs or careers (59.4%, *n* = 367) and just over half of teachers placing low or no emphasis in preparing students for the Junior Cycle Profile of Achievement (51.5%, *n* = 314). Interest in mathematics as a discipline was promoted with varying levels of emphasis, with three in 10 teachers having placed a high emphasis on this (29.3%, *n* = 181).

Figure 14 – Level of emphasis placed on different activities in Third Year mathematics classes weekly

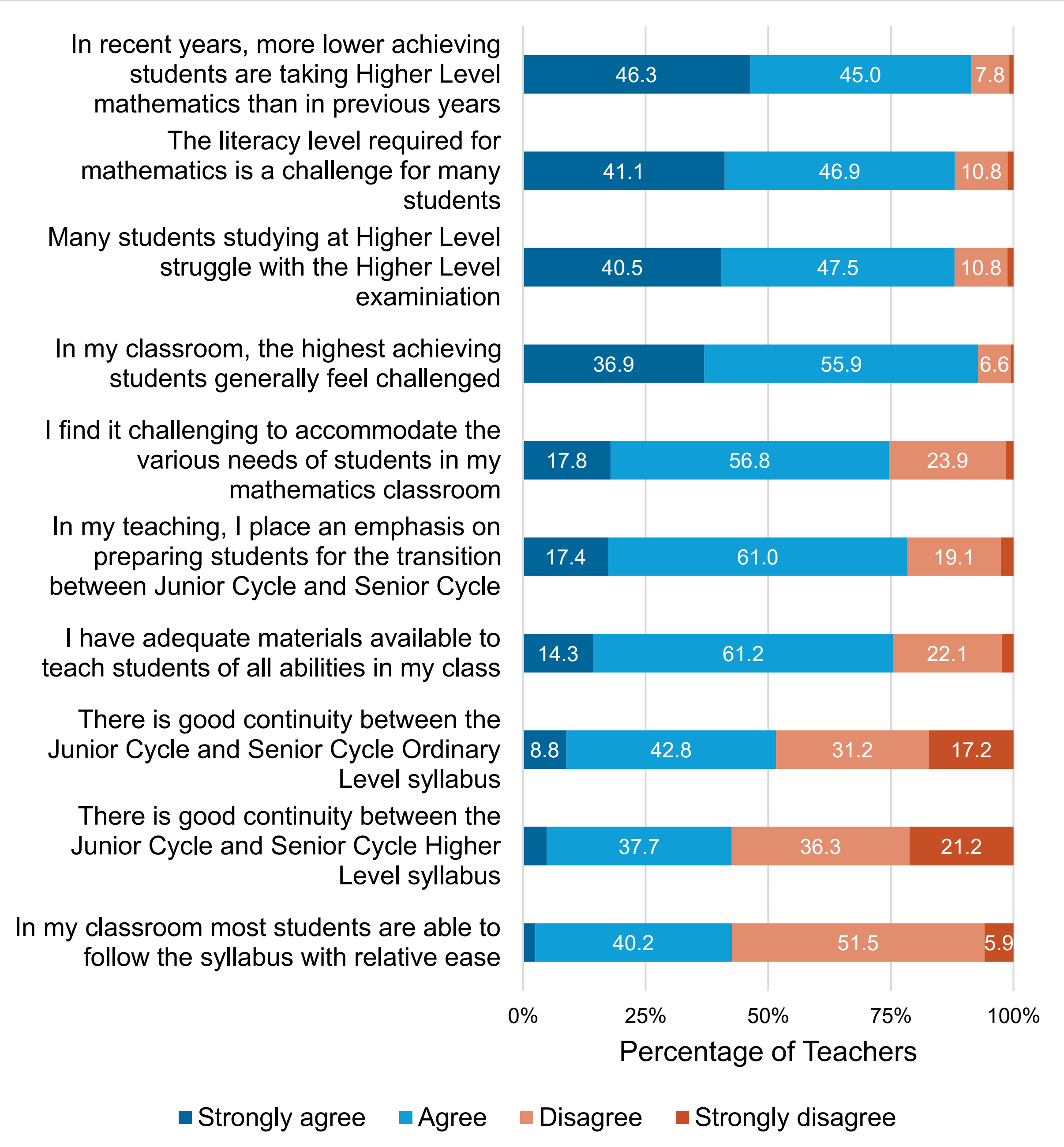


Note. See Table A17

5.2. Senior Cycle teaching

Teachers who teach at a senior level reported mixed views on whether there was good syllabus continuity between Junior Cycle and Senior Cycle, similar to findings among teachers of Junior Cycle students. At Ordinary Level 51.6% agreed with this statement (*n* = 374) and fewer agreed with this at Higher Level (42.5%, *n* = 291). Almost four in five teachers reported that they place an emphasis on preparing students for the transition between Junior and Senior Cycles (78.4%, *n* = 554). Two in five (42.6%, *n* = 231) of teachers agreed or strongly agreed that most students are able to follow the syllabus with relative ease. Teachers agreed that many students studying at Higher Level struggle with the examination (88.0%, *n* = 655) and that more lower-achieving students are taking Higher Level mathematics than in previous years (91.3%, *n* = 686). Similar to the findings for the Junior Cycle, many teachers agreed or strongly agreed that the literacy level required in mathematics classes is a challenge for many students (88.0%, *n* = 655). Most teachers agreed that the highest achieving students generally felt challenged (92.8%, *n* = 686). Three quarters of teachers agreed they had adequate materials to teach students of all abilities in their class (75.5%, *n* = 561) while a similar proportion agreed (74.6%, *n* = 553) that they found it challenging to accommodate the various needs of students in their classrooms (see Figure 15).

Figure 15 – Teachers' views about teaching mathematics at Senior Cycle level

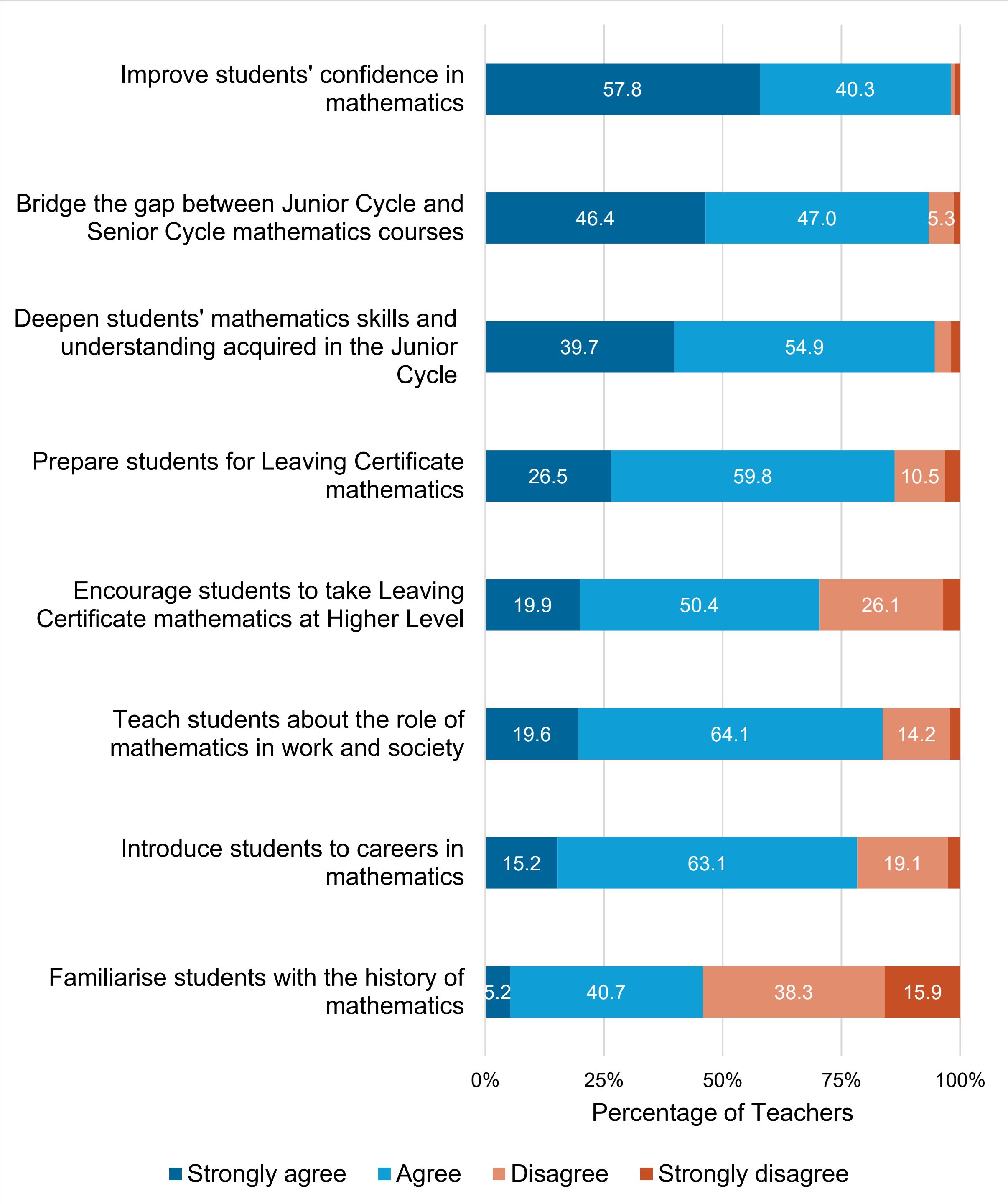


Note. See Table A18

5.2.1. Transition Year mathematics

Teachers were asked to what extent they agreed with a series of statements about the purposes of mathematics in Transition Year (see Figure 16). The majority of teachers strongly agreed or agreed that the purpose of Transition Year mathematics is to improve students' confidence in mathematics (98.0%, n = 458). Similarly, most teachers thought Transition Year mathematics' purpose was to deepen students' mathematics skills acquired during the Junior Cycle (94.7%, n = 443), to bridge the gap to Senior Cycle mathematics (93.4%, n = 437), and to prepare students for Leaving Certificate mathematics (86.2%, n = 401). There was less agreement that the purpose of Transition Year mathematics was to encourage students to take Higher Level mathematics in the Leaving Certificate (70.3%, n = 329). There was high agreement that Transition Year could introduce students to careers in mathematics (78.3%, n = 389) and to teach them about the role of mathematics in work and society (83.7%, n = 389). There was a split opinion that the purpose of Transition Year was to familiarise students with the history of mathematics, with slightly more teachers disagreeing (54.2%, n = 252) than agreeing.

Figure 16 – Teachers' views on the purpose of Transition Year mathematics

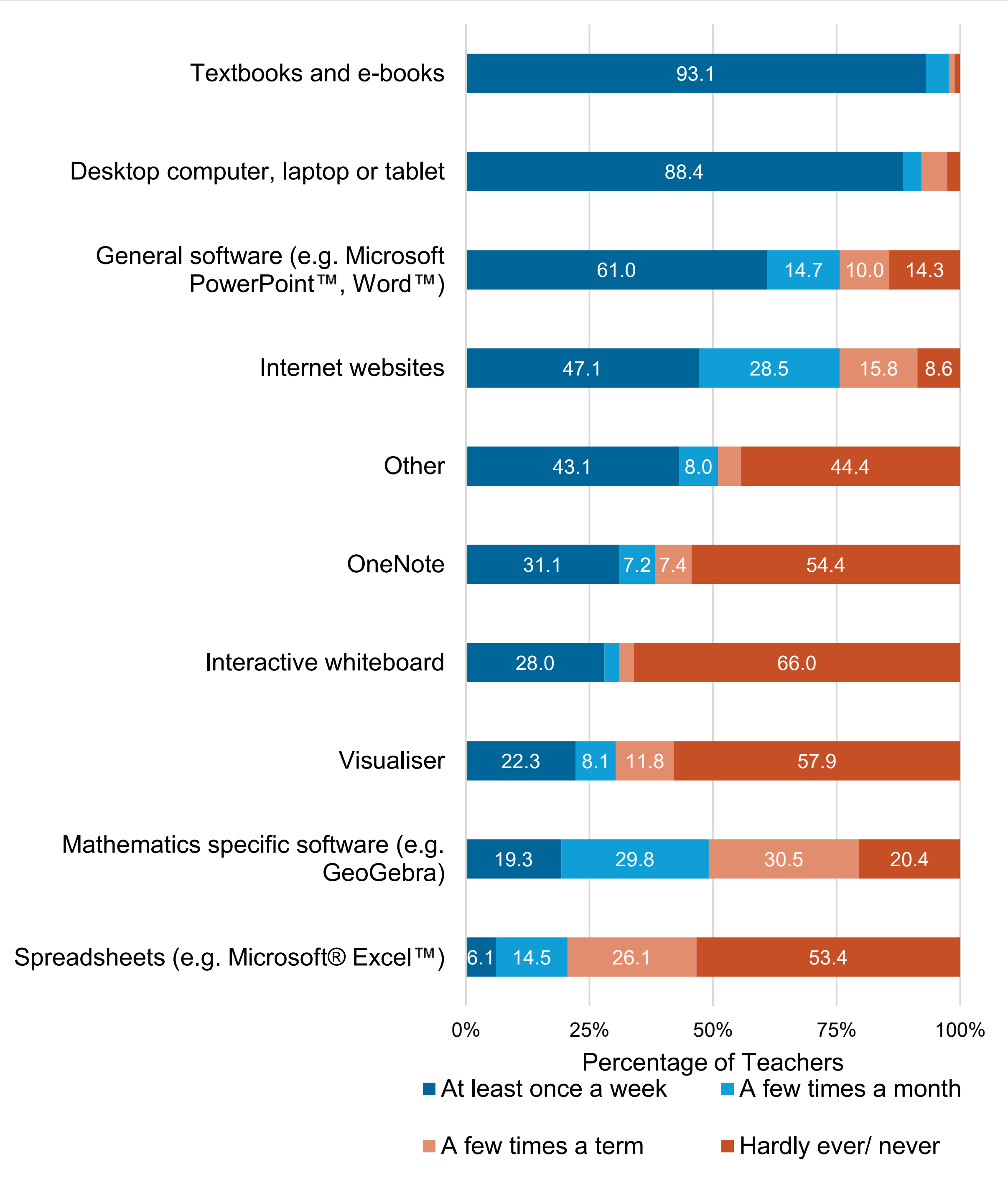


Note. See Table A19

5.3. Digital teaching resources

Teachers were asked how often different digital resources were used by the teacher and the students to support learning and teaching in Junior Cycle mathematics classes. Figure 17 details the resources used in Junior Cycle mathematics classes, with most teachers having used textbooks and eBooks (93.1%, *n* = 738) as well as digital devices such as desktop computers, laptops, or tablets (88.4%, *n* = 700) at least once a week to support teaching and learning. Three-quarters of teachers used websites (75.6%, *n* = 595) and general software such as Microsoft PowerPoint and Word (75.7%, *n* = 597) at least a few times a month if not more frequently. Resources such as interactive whiteboards (66.0%, *n* = 511), Visualiser (57.9%, *n* = 453), OneNote (54.4%, *n* = 425), and spreadsheets (53.4%, *n* = 421), were some of the least used resources with over half of teachers reporting that they hardly ever or never used these to support their teaching. Almost half of teachers reported using mathematics software (e.g., GeoGebra) at least a few times per month (49.1%, *n* = 387).

Figure 17 – Frequency of resources used by teachers to support teaching and learning in Junior Cycle mathematics classes

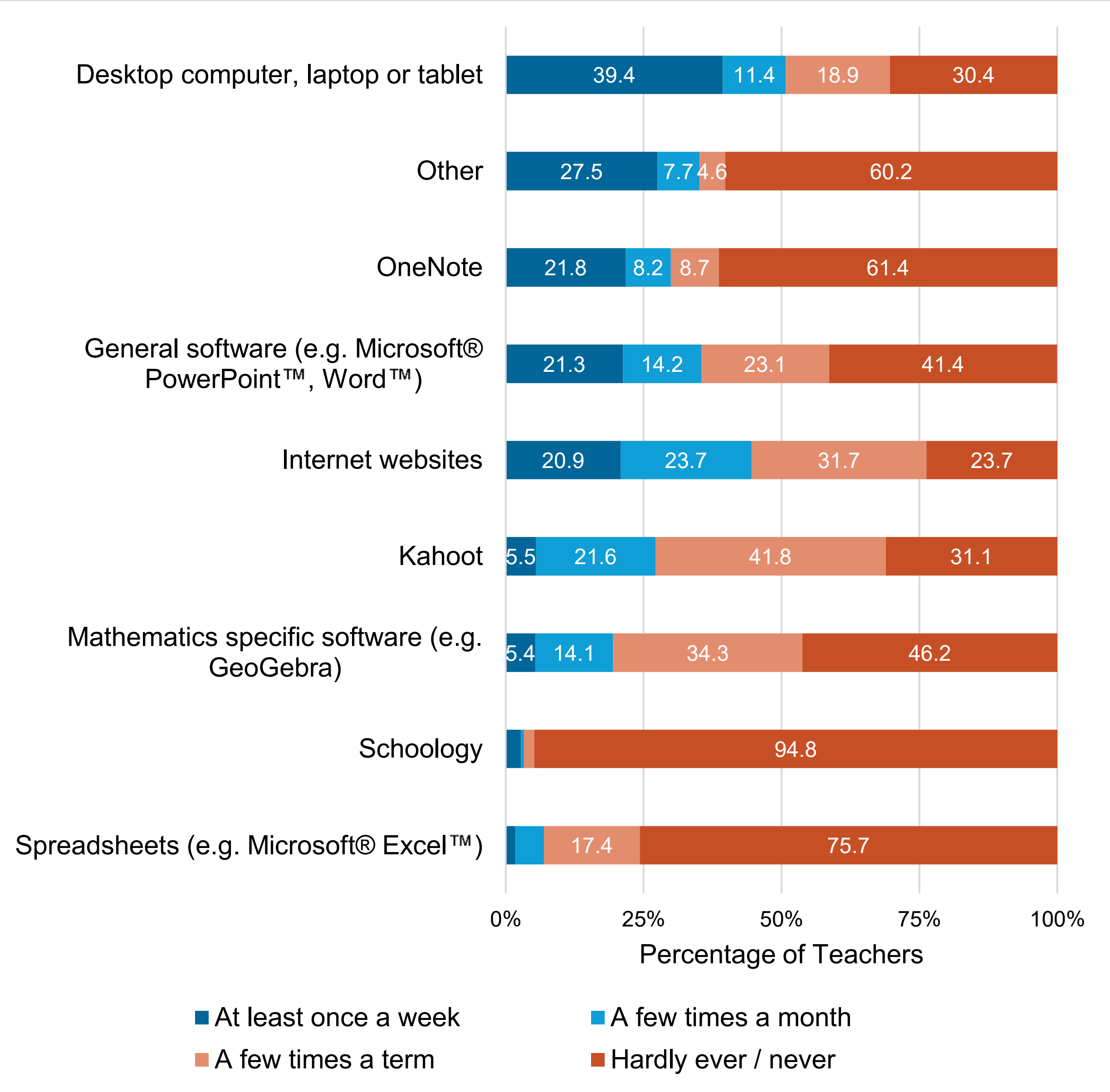


Note. See Table A20

Teachers were also asked about the resources students used in their Junior Cycle mathematics classes to support teaching and learning (see Figure 18). Approximately half of teachers reported that their students used digital devices to support teaching and learning at least a few times per month (50.8%, *n* = 406).

Approximately one-fifth of teachers reported that their students used resources such as OneNote (21.8%, n = 173), websites (20.9%, n = 167), and software such as Microsoft Word and PowerPoint (21.3%, n = 169) at least once a week. Kahoot, a game-based learning platform, was mostly used by students a few times a term (41.8%, n = 334) or hardly ever/never (31.1%, n = 249). Almost half of teachers (46.2%, n = 370) indicated that their students hardly ever or never used mathematics software such as GeoGebra.

Figure 18 – Frequency of resources used by students to support teaching and learning in Junior Cycle mathematics classes

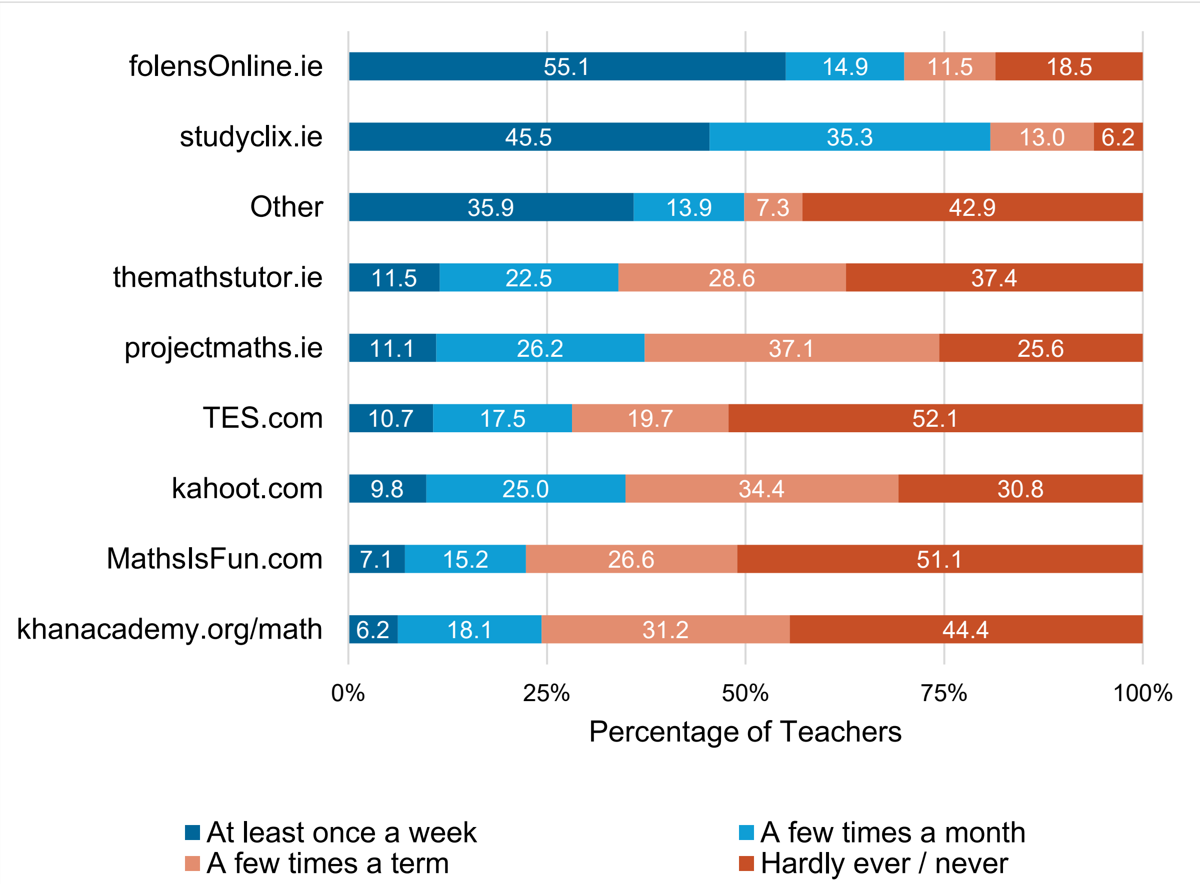


Note. See Table A21

Figure 19 presents information on the websites and digitally-based applications ("apps") used by teachers to support teaching and learning in Junior Cycle mathematics classes. The most frequently used websites were FolensOnline.ie, used by 55.1% (*n* = 440) at least once a week. Studyclix.ie was used by less than half of teachers at least once a week (45.5%, *n* = 367). Other resources were less frequent, with one in 10 teachers using TheMathsTutor.ie (11.5%, *n* = 92), ProjectMaths.ie (11.1%, *n* = 89), TES.com (10.7%, *n* = 85), and Kahoot.com (9.8%, *n* = 79) once a week. Both MathsIsFun.com (7.1%, *n* = 57) and KhanAcademy.org/Math (6.2%, *n* = 50) were the least common resources used at least once per week.

Teachers were given the option to describe other resources that were used that were not listed. Some of the most frequent other resources were Microsoft Teams, Blooket, Quizziz, CJ Fallon, and Google resources such as Google Classroom and Google Suite.

Figure 19 – Frequency of websites and apps used by teachers to support teaching and learning in Junior Cycle mathematics classes



Note. See Table A22

Chapter 6: Conclusions and Implications

This report provides insights into post-primary mathematics teachers in Ireland, including their backgrounds and professional profiles, working life, views on teaching mathematics, and their teaching practices and use of digital resources. It also offers an overview of teachers' profiles during a critical period (autumn 2022) following a prolonged phase of school closures and remote teaching. The challenges surrounding the 2022 PISA administration are reflected in the response rate to the teacher questionnaire, which was substantially lower than that of the corresponding questionnaire in 2012, when mathematics was last the major domain (Cosgrove et al., 2012).[6,7]

6.1. Background and qualifications

The mathematics teachers who took part in this PISA 2022 survey were predominantly female, and the majority had more than 10 years of teaching experience. Consistent with the findings from PISA 2012 (Cosgrove et al., 2012), most teachers held a primary degree that contained at least some element of mathematics, with a Bachelor of Arts or Science being the most prevalent undergraduate qualifications. The percentage of teachers with Bachelor's of Arts or Science degrees with mathematics declined, compared to 2012, but this might be accounted for in the increase in the teacher education degree with mathematics, possibly reflecting different ways in which a teacher can be qualified with mathematics.

[6] The response rate to mathematics teacher questionnaire was lower in 2022 (58.3%) compared to 2012 (80.3%).

[7] PISA 2012 coincided with the implementation of substantial revisions to the mathematics curriculum and assessment at Junior and Senior Cycle levels in post-primary education in Ireland, known as Project Maths. Consequently, Cosgrove et al.'s (2012) report focused on aspects of Project Maths. While there is some overlap between the mathematics teacher questionnaires used in PISA 2012 and PISA 2022, caution should be exercised when comparing results between the two cycles, due to both differences in the focus of the instruments and to the fact that the teacher samples are not representative.

In addition, the majority possessed postgraduate qualifications, typically in education and often with a mathematics component. The high proportion of highly-qualified teachers aligns with findings from the Trends in International Mathematics and Science Study (TIMSS) for Ireland, which similarly indicated that teachers' formal education levels have considerably increased since 2011 (Pitsia et al., 2025). Goos et al. (2023) found that there has been a substantial reduction in the number of out-of-field mathematics teachers in Ireland since the introduction of a PDMT in 2012, while O'Meara and Fitzmaurice (2025) noted that this qualification has been recognised as an exemplar model of upskilling for out-of-field teachers of mathematics. However, there appears to have been a slight decrease in the proportion of teachers holding postgraduate qualifications, compared to 2012 (Cosgrove et al., 2012).[8]

Teachers, overall, reported that their qualifications had adequately prepared them for teaching mathematics. However, a substantial proportion felt less well prepared in the area of formative assessment in mathematics. It is important to acknowledge that CPD in recent years has focused more on formative assessment. Finally, most teachers agreed that their education had adequately prepared them to assess mathematics through teacher-prepared tests.

6.2. Work life

The findings of this report also highlight the overall stability of the mathematics teaching workforce, as well as the substantial teaching responsibilities carried by teachers. The majority of teachers reported being in permanent, full-time positions, with only a small proportion employed on fixed-term contracts or part-time employment. At Junior Cycle, most teachers reported teaching mathematics at Higher Level, with many also teaching at Ordinary Level. Most teachers reported teaching loads of 11 hours or more per week, while 37.5% of teachers reported spending 16 or more hours teaching this subject. It is expected that for a considerable proportion of mathematics teachers, their teaching hours are not dedicated only to teaching mathematics. It should be noted that a maximum of 22

[8] The data from the current analysis is unweighted, whereas Cosgrove et al.'s data is weighted to reflect the population of mathematics teachers in Ireland.

hours of teaching time per week is the standard for full-time post-primary teachers in Ireland; teachers who teach Junior Cycle are entitled to 22 hours of professional time per year, based on Circular 0029/2017.

TALIS results highlight the importance of balanced work life as excessive workload can negatively impact teachers' well-being, job satisfaction, and effectiveness (OECD, 2025a). This issue appears to be particularly important for novice teachers, for whom the exposure to the realities of classroom teaching can be overwhelming. Given the specific challenges they face, it is important that early-career teachers receive targeted support, including sufficient time for professional development and lesson preparation.

6.3. Professional development

Since 2017, teachers are entitled to 22 hours of professional development time per annum. The results indicate that a large majority of teachers surveyed had undertaken at least some CPD hours in activities related to mathematics or the teaching of mathematics within the previous three years. For many teachers, this accounted for less than nine hours over that period. Overall, they reported limited engagement with the listed professional development options.

According to TIMSS findings, in 2023, fewer students were taught by teachers who had recently completed professional development in mathematics education compared to previous cycles (Pitsia et al., 2025). This trend may reflect broader patterns observed in the international survey of adult skills, Programme for the International Assessment of Adult Competencies (PIAAC) 2023, which found that teachers in Ireland participated in fewer professional development activities than adults in other professions, a pattern not commonly observed across other countries or in the OECD on average (OECD, 2024, 2025a). These findings suggest that, despite the significant investment in teacher professional development and also professional time for Junior Cycle educators, there is a need for greater emphasis on CPD among teachers. However, it should be taken into account that these data were collected in the period following the COVID-19 pandemic, when teachers were expected to spend a substantial portion of their time resources addressing the consequences of lockdowns and prolonged periods of remote teaching.

6.4. Mathematics at the Junior and Senior Cycle

This report also explores teachers' experiences and perspectives on teaching mathematics across cycles and grade levels (Junior Cycle, Transition Year, Senior Cycle). Across both Junior and Senior Cycle, teachers reported that more lower-achieving students were taking Higher Level mathematics compared to previous years, something that could be attributed to the bonus scheme for Higher Level Leaving Certificate, according to which students taking Higher Level mathematics can get a bonus of 25 points for their Third Level admissions entry points (O'Meara et al., 2020). At the same time, teachers noted that many students appeared to struggle with the demands of the Higher Level examination. Treacy et al. (2025) highlighted that the motivation generated by the bonus-points mechanism is predominantly extrinsic rather than intrinsic, a pattern that may exacerbate challenges for teachers, including teaching mathematics for understanding and pedagogical inclusion.

While teachers tended to agree that high-achieving students were appropriately challenged, they also acknowledged ongoing difficulties in meeting the diverse learning needs of their students at both Junior and Senior Cycle. Teachers also expressed concern that the level of literacy required in mathematics classes poses a challenge for students, an especially noteworthy finding given Irish students' strong performance in reading literacy (Delaney et al., 2023; Donohue, Perkins, Walsh, et al., 2023).

Among those teaching Third Year mathematics, most reported placing a strong emphasis on whole-class activities, while considerably fewer indicated that they highly emphasised individualised learning. Such practices can impact the opportunity for students to be challenged appropriately in lessons and may not limit students' ability to develop further. Only around one in five teachers reported placing a high emphasis on small-group activities. This is in line with McGarr et al.'s (2023) work that according to which most students tend to mainly listen to the teacher and work on their own. These findings highlight the need to incorporate more dynamic, collaborative, and student-centred learning activities in mathematics classrooms to foster deeper engagement and more sustained motivation.

Regarding the role of Transition Year mathematics, teachers agreed that its purpose is to improve student confidence, deepen their mathematics skills acquired during the Junior Cycle, and bridge the gap to Senior Cycle. Most teachers also agreed that Transition Year should prepare students for the Leaving Certificate, encourage them to take mathematics at Higher Level, highlight the role of mathematics in work and society, and introduce possible career paths involving mathematics. Fewer teachers, however, considered that familiarising students with the history of mathematics was the purpose of Transition Year mathematics.

In relation to more specific areas of the curriculum, teachers of algebra at Junior Cycle indicated that the two most prevalent approaches to learning were practising skills and procedures ("drill and practice") and linking algebra to other areas of the mathematics curriculum. Activities such as working with visual patterns, encouraging students to use different algebraic expressions or alternative representations to portray the same relationship were less common.

6.5. Use of digital resources

Across all mathematics classes in Junior Cycle, teachers reported using a wide range of digital resources and tools. As expected, the most commonly used resources were textbooks and eBooks, and the majority of teachers also reported using a desktop computer or similar device in their classes. Despite significant investments aiming to further embed technology and digital learning tools in schools (Department of Education and Skills, 2015), fewer teachers indicated that their students regularly used digital devices. Interactive whiteboards, visualisers, and platforms such as Schoology were reported as being rarely or never used.

Findings from the most recent TALIS study indicate that, in general, teachers agree that using digital tools can enhance students' interest in learning (OECD, 2025a). However, opinions are more divided regarding whether such tools improve academic performance. Younger teachers are more likely to use digital technologies and tools. Overall, this report indicated that teachers with a significant share of students in their class with difficulties understanding the language of instruction or with special education needs were more likely to use digital resources for whole-class and/or individualised instruction and assessment. In contrast, teachers working with classes that included a large proportion of low-achieving or socio-economically disadvantaged students tended to use digital resources less frequently. According to McGarr et al. (2023), Irish teachers use technology mostly for sharing resources, communicating with colleagues, developing instructional materials, and integrating it into their teaching. For students, technology appeared to be used primarily during the completion of their Classroom-Based Assessments (CBAs), where it was essential for conducting research on their chosen topics and for preparing presentations and reports.

According to TIMSS 2023 results, the availability of digital devices in both primary and post-primary schools in Ireland has increased substantially over time (Pitsia et al., 2025); something that may be partly attributable to the new realities that schools, teachers, and students were required to manage during and after the COVID-19 pandemic. In this context of growing exposure to new technologies, it is important to recognise that one of the most profound shifts in education concerns the tools teachers use. Artificial intelligence has rapidly entered schools, and teachers and education systems now face the responsibility of embracing its potential to enhance teaching and learning while safeguarding students from its possible adverse effects (OECD, 2025a).

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Appendix

Table A1 – Gender reported by respondents

	n	%
Female	580	60.9
Male	368	38.7
Non-binary	3	0.3
Not listed above	1	0.1

Note. Missing cases: 0.1% (*n* = 1).

Table A2 – Length of teaching time

	n	%
1-2 years	74	7.8
3-5 years	108	11.3
6-10 years	201	21.1
11-20 years	318	33.4
21 years or more	251	26.4

Note. Missing cases: 0.1% (*n* = 1).

Table A3 – Studied mathematics teaching methods in teacher preparation

	n	%
Yes	759	81.9
No	168	18.1

Note. Missing cases: 2.7% (*n* = 26).

Table A4 – Types of undergraduate qualifications with a mathematics component

	n	%
Primary degree with mathematics up to final year (a minimum of 33% of time allocated to mathematics)	615	65.1
Primary degree with mathematics in first and second years	143	15.1
Primary degree with mathematics in first year only	106	11.2
Primary degree that did not include mathematics as a subject	74	7.8
None of the above	7	0.7

Note. Missing cases: 0.8% (*n* = 8).

Table A5 – Type of undergraduate qualifications

	n	%
B.A./B.Sc. with mathematics	497	53.7
B.A./B.Sc. without mathematics	129	13.9
Teacher education degree (e.g. B.Ed.) with mathematics	107	11.6
B. Commerce / Business degree	89	9.6
Teacher education degree (e.g. B.Ed.) without mathematics	45	4.9
B.Eng. (Bachelor's in Engineering)	38	4.1
Other	20	2.2

Note. Missing cases: 2.9% (*n* = 28).

Table A6 – Type of postgraduate qualifications

	n	%
Higher Diploma in Education / Postgraduate Diploma in Education with mathematics	381	41.3
Other postgraduate qualification unrelated to mathematics or the teaching of mathematics	147	15.9
Higher Diploma in Education / Postgraduate Diploma in Education without mathematics	145	15.7
Professional Master's in Education with mathematics	116	12.6
Other postgraduate qualification related to mathematics or the teaching of mathematics	97	10.5
Professional Diploma in Mathematics for Teaching	89	9.6
Master's in Education (i.e., MEd.) without mathematics	54	5.9
Professional Master's in Education without mathematics	46	5.0
Master's in Education (i.e., MEd.) with mathematics	14	1.5
I do not hold a postgraduate qualification	138	15.0

Note. Missing cases: 3.1% (*n* = 30).

Table A7 – CPD engaged in the past three years, during or outside school hours

	None		1 – 8 hours		9 – 16 hours		17 – 24 hours		25 + hours	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%
In-school professional development activities relating to mathematics	125	13.3	468	49.8	193	20.6	79	8.4	74	7.9
External CPD courses or workshops (e.g. those offered by JCT, PDST, education centres, etc.)	126	13.4	424	45.1	219	23.3	89	9.5	82	8.7
Self-directed CPD relating to mathematics, (e.g. study of mathematics materials; of books or journals on mathematics education, online forums, followed an online course)	132	14.1	388	41.3	166	17.7	80	8.5	173	18.4
External meetings relating to mathematics (e.g. Irish Maths Teachers Association)	481	51.6	347	37.2	67	7.2	19	2.0	19	2.0
Formal postgraduate study that included mathematics or mathematics education (e.g. M.A., M.Ed.)	833	89.4	27	2.9	8	0.9	2	0.2	62	6.7

Note. Missing cases ranged from 1.4% to 2.2% (*n* = 13 to *n* = 21).

Table A8 – Adequacy of aspects of qualifications in preparation for the teaching of mathematics to post-primary

	Strongly disagree		Disagree		Agree		Strongly agree	
	n	%	*n*	%	*n*	%	*n*	%
General teaching methods / pedagogy	20	2.2	122	13.3	475	51.9	298	32.6
Mathematical content	37	4.1	180	20.1	394	43.9	286	31.9
Teaching methods / pedagogy of mathematics	36	4.1	184	20.9	435	49.4	226	25.7
Assessment in general	29	3.2	227	24.9	456	50.1	199	21.8
Formative assessment in mathematics	52	5.9	292	33.3	385	43.8	149	17.0

Note. Missing cases ranged from 0.7% to 1.5% (*n* = 7 to *n* = 14).

Table A9 – Adequately prepared for aspects of teacher education for teaching mathematics

	Strongly disagree		Disagree		Agree		Strongly agree	
	n	%	*n*	%	*n*	%	*n*	%
Assess mathematics through teacher-prepared tests	55	6.2	208	23.6	443	50.2	177	20.1
Use digital technologies (as teacher) for teaching learning and assessment	155	17.6	275	31.2	322	36.6	129	14.6
Support your students in using digital technology for learning and assessment	181	20.8	350	40.2	255	29.3	85	9.8

Note. Missing cases ranged from: 0.5% to 0.7% (*n* = 5 to *n* = 7).

Table A10 – Type of employment

	n	%
Full-time	843	91.9
Part-time	74	8.1

Note. Missing cases: 3.8% (*n* = 36).

Table A11 – Teachers' employment status

	n	%
Permanent employment	765	80.5
Fixed term contract for a period of one school year or less	100	10.5
Fixed term contract for a period of more than one school year	76	8.0
Occasional substitute teacher	9	0.9

Note. Missing cases: 0.3% (*n* = 3).

Table A12 – Weekly hours spent teaching mathematics across year groups

	None		One		Two		Three		Four or more	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%
First Year	362	41.2	30	3.4	98	11.2	316	36.0	73	8.3
Second Year	271	31.8	23	2.7	68	8.0	396	46.5	93	10.9
Third Year	249	29.4	18	2.1	70	8.3	402	47.4	109	12.9
Transition Year	382	48.9	38	4.9	143	18.3	189	24.2	29	3.7
Fifth Year	230	28.1	23	2.8	37	4.5	174	21.2	356	43.4
Sixth Year	232	28.4	19	2.3	27	3.3	155	19.0	384	47.0
Other levels or programmes, including repeat Leaving Cert students, adult or PLC courses	554	90.2	9	1.5	26	4.2	16	2.6	9	1.5

Note. Missing cases ranged from 7.8% to 18.0% (*n* = 74 to *n* = 172).

Table A13 – Weekly hours spent teaching mathematics across all year levels

	n	%
None	16	1.7
1 to 5 hours	125	13.4
6 to 10 hours	251	26.8
11 to 15 hours	192	20.5
16 hours or more	351	37.5

Table A14 – Levels teachers taught Junior Cycle mathematics in this academic year

	n	%
Ordinary Level	535	56.4
Higher Level	627	65.8
Both Higher and Ordinary level	232	17.8
Not taught Junior Cycle mathematics this year	140	14.7

Note. Missing cases: 0.4% (*n* = 4). As teachers could indicate teaching both Higher and Ordinary Level, the percentages do not sum to 100.0%.

Table A15 – Teachers' views about teaching mathematics at Junior Cycle level

	Strongly disagree		Disagree		Agree		Strongly agree	
	n	%	*n*	%	*n*	%	*n*	%
In my teaching, I place an emphasis on helping students to link mathematical concepts to everyday life	7	0.9	82	10.5	464	59.4	228	29.2
In recent years, more lower-achieving students are taking Higher Level mathematics than in previous years	10	1.4	75	10.3	345	47.5	297	40.9
The literacy level required for mathematics is a challenge for many students	8	1.0	90	11.5	343	43.9	341	43.6
In my classroom, the highest-achieving students generally feel challenged	10	1.3	103	13.3	456	58.8	207	26.7
I find it challenging to accommodate the various needs of students in my mathematics classroom	9	1.2	189	24.1	420	53.6	165	21.1
I have adequate materials available to teach students of all abilities in my class	26	3.3	182	23.3	444	56.8	130	16.6
In my teaching, I place an emphasis on preparing students for the transition between Junior Cycle and Senior Cycle	18	2.4	204	26.8	417	54.9	121	15.9
Many students studying at Higher Level struggle with the Higher Level examination	8	1.1	223	31.6	315	44.7	159	22.6
There is good continuity between the Junior Cycle and Senior Cycle Ordinary Level syllabus	121	16.6	208	28.6	331	45.5	67	9.2
In my classroom, most students are able to follow the syllabus with relative ease	45	5.7	320	40.8	376	47.9	44	5.6
There is good continuity between the Junior Cycle and Senior Cycle Higher Level syllabus	145	20.6	239	34.0	284	40.4	35	5.0

Note. Missing by design: 14.7% (*n* = 140). Other missing cases ranged from 2.9% to 11.4% (*n* = 28 to *n* = 108).

Table A16 – Frequency of activities in algebra classes at Junior Cycle

	Every/almost every lesson		About half of lessons		Some lessons		Never	
	n	%	*n*	%	*n*	%	*n*	%
Use PDST Mathematics Development Team materials, e.g. *Algebra through the Lens of Functions*	34	4.4	76	9.7	396	50.8	274	35.1
Work with visual patterns	48	6.1	127	16.2	574	73.2	35	4.5
Encourage students to use different algebraic expressions to represent the same pattern / relationship	95	12.2	217	27.8	410	52.5	59	7.6
Encourage students to use alternative representations (e.g. verbal, tabular, graphical) before formal symbolic algebra	98	12.5	229	29.2	371	47.3	86	11.0
Embed algebra in real-life situations e.g. money box problems, growth of sunflowers	103	13.2	246	31.6	405	52.0	25	3.2
Link algebra to other areas of the mathematics curriculum e.g. co-ordinate geometry	261	33.3	293	37.4	223	28.4	7	0.9
Encourage students to practice skills and procedures ('drill and practice') e.g. simplifying, factoring, substituting etc.	437	55.8	244	31.2	96	12.3	6	0.8

Note. Missing by design: 11.4% (*n* = 109). Other missing cases ranged from 6.3% to 6.8% (*n* = 60 to *n* = 64).

Table A17 – Level of emphasis placed on different activities in Third Year mathematics classes

	None		Low		Medium		High	
	n	%	*n*	%	*n*	%	*n*	%
Whole-class teaching activities	2	0.3	48	7.8	193	31.2	375	60.7
Analysing and understanding students' mathematical errors or misconceptions	7	1.1	59	9.5	268	43.2	287	46.2
Keeping order in the classroom	63	10.2	132	21.4	173	28.0	250	40.5
Individual student learning activities	6	1.0	95	15.5	268	43.8	243	39.7
Reviewing homework assignments	6	1.0	90	14.6	292	47.3	229	37.1
Administrative tasks such as recording attendance	14	2.3	289	46.7	111	17.9	205	33.1
Promoting interest in mathematics as a discipline	16	2.6	144	23.3	276	44.7	181	29.3
Preparing students for the Junior Cycle Profile of Achievement	85	13.9	229	37.5	174	28.5	122	20.0
Student learning activities in small groups	33	5.4	238	38.6	236	38.3	109	17.7
Exploring how mathematics is used in various jobs or careers	67	10.8	300	48.5	194	31.4	57	9.2

Note. Missing by design: 14.9% (*n* = 142). Other missing cases ranged from 20.3% to 21.1% (*n* = 193 to *n* = 201).

Table A18 – Teachers' views about teaching mathematics at Senior Cycle level

	Strongly disagree		Disagree		Agree		Strongly agree	
	n	%	*n*	%	*n*	%	*n*	%
In recent years, more lower-achieving students are taking Higher Level mathematics than in previous years	6	0.9	55	7.8	317	45.0	326	46.3
The literacy level required for mathematics is a challenge for many students	9	1.2	80	10.8	349	46.9	306	41.1
Many students studying at Higher Level struggle with the Higher Level examination	8	1.3	69	10.8	304	47.5	259	40.5
In my classroom, the highest-achieving students generally feel challenged	4	0.5	49	6.6	413	55.9	273	36.9
I find it challenging to accommodate the various needs of students in my mathematics classroom	11	1.5	177	23.9	421	56.8	132	17.8
In my teaching, I place an emphasis on preparing students for the transition between Junior Cycle and Senior Cycle	18	2.6	135	19.1	431	61.0	123	17.4
I have adequate materials available to teach students of all abilities in my class	18	2.4	164	22.1	455	61.2	106	14.3
There is good continuity between the Junior Cycle and Senior Cycle Ordinary Level syllabus	125	17.2	226	31.2	310	42.8	64	8.8
There is good continuity between the Junior Cycle and Senior Cycle Higher Level syllabus	145	21.2	248	36.3	258	37.7	33	4.8
In my classroom, most students are able to follow the syllabus with relative ease	44	5.9	382	51.5	298	40.2	18	2.4

Note. Missing by design: 10.1% (*n* = 96). Other missing cases ranged from 11.8% to 22.6% (*n* = 113 to *n* = 216).

Table A19 – Teachers’ views on the purpose of Transition Year mathematics

	Strongly disagree		Disagree		Agree		Strongly agree	
	n	%	*n*	%	*n*	%	*n*	%
Improve students' confidence in mathematics	5	1.1	4	0.9	188	40.3	270	57.8
Bridge the gap between Junior Cycle and Senior Cycle mathematics courses	6	1.3	25	5.3	220	47.0	217	46.4
Deepen students' mathematics skills and understanding acquired in the Junior Cycle (e.g. solving real-life problems using mathematical concepts)	9	1.9	16	3.4	257	54.9	186	39.7
Prepare students for Leaving Certificate mathematics	15	3.2	49	10.5	278	59.8	123	26.5
Encourage students to take Leaving Certificate mathematics at Higher Level	17	3.6	122	26.1	236	50.4	93	19.9
Teach students about the role of mathematics in work and society	10	2.2	66	14.2	298	64.1	91	19.6
Introduce students to careers in mathematics	12	2.6	89	19.1	294	63.1	71	15.2
Familiarise students with the history of mathematics	74	15.9	178	38.3	189	40.7	24	5.2

Note. Missing by design: 35.6% (*n* = 339). Other missing cases ranged from 15.3% to 15.6% (*n* = 146 to *n* = 149).

Table A20 – Frequency of resources used by teachers to support teaching and learning in Junior Cycle mathematics classes

	At least once a week		A few times a month		A few times a term		Hardly ever/ never	
	n	%	*n*	%	*n*	%	*n*	%
Textbooks and e-books	738	93.1	37	4.7	9	1.1	9	1.1
Desktop computer, laptop or tablet	700	88.4	30	3.8	41	5.2	21	2.7
General software (e.g. Microsoft® PowerPoint™, Word™)	481	61.0	116	14.7	79	10.0	113	14.3
Internet websites	371	47.1	224	28.5	124	15.8	68	8.6
OneNote	243	31.1	56	7.2	58	7.4	425	54.4
Interactive whiteboard	217	28.0	23	3.0	23	3.0	511	66.0
Visualiser	174	22.3	63	8.1	92	11.8	453	57.9
Mathematics-specific software (e.g. GeoGebra)	152	19.3	235	29.8	240	30.5	161	20.4
Other	103	43.1	19	8.0	11	4.6	106	44.4
Spreadsheets (e.g. Microsoft® Excel™)	48	6.1	114	14.5	206	26.1	421	53.4

Note. Missing by design: 11.7% (*n* = 140). Other missing cases ranged from 2.2% to 4.1% (*n* = 21 to n = 39).

Table A21 – Frequency of resources used by students to support teaching and learning in Junior Cycle mathematics classes

	At least once a week		A few times a month		A few times a term		Hardly ever/ never	
	n	%	*n*	%	*n*	%	*n*	%
Desktop computer, laptop or tablet	315	39.4	91	11.4	151	18.9	243	30.4
OneNote	173	21.8	65	8.2	69	8.7	488	61.4
General software (e.g. Microsoft® PowerPoint™, Word™)	169	21.3	113	14.2	184	23.1	329	41.4
Internet websites	167	20.9	190	23.7	254	31.7	190	23.7
Other	90	27.5	25	7.7	15	4.6	197	60.2
Kahoot	44	5.5	173	21.6	334	41.8	249	31.1
Mathematics specific software (e.g. GeoGebra)	43	5.4	113	14.1	275	34.3	370	46.2
Schoology	22	2.8	4	0.5	15	1.9	749	94.8
Spreadsheets (e.g. Microsoft® Excel™)	14	1.8	41	5.2	138	17.4	602	75.7

Note. Missing by design: 14.7% (*n* = 140). Other missing cases ranged from 1.3% to 2.4% (*n* = 12 to *n* = 23).

Table A22 – Frequency of use for some websites and apps in Junior Cycle mathematics classes

	At least once a week		A few times a month		A few times a term		Hardly ever/ never	
	n	%	*n*	%	*n*	%	*n*	%
FolensOnline.ie	440	55.1	119	14.9	92	11.5	148	18.5
Studyclix.ie	367	45.5	285	35.3	105	13.0	50	6.2
Other	93	35.9	36	13.9	19	7.3	111	42.9
themathstutor.ie	92	11.5	180	22.5	229	28.6	299	37.4
Projectmaths.ie	89	11.1	211	26.2	298	37.1	206	25.6
TES.com	85	10.7	139	17.5	157	19.7	415	52.1
Kahoot.com	79	9.8	201	25.0	276	34.4	247	30.8
MathsIsFun.com	57	7.1	122	15.2	213	26.6	409	51.1
Khanacademy.org/math	50	6.2	145	18.1	250	31.2	356	44.4

Note. Missing by design: 14.7% (*n* = 140).
Other missing cases ranged from 0.6% to 1.8% (*n* = 6 to *n* = 17).

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