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Exploring Teachers' Perspectives on Mathematics Anxiety: Practices and Support Needs Across Europe

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Abstract: Mathematics anxiety (MA) is a widespread phenomenon that affects students' engagement, well-being, performance, and future careers. This study explores how primary and secondary school teachers across five European countries notice and respond to students' MA and are supported in this matter. Using a mixed-methods approach combining questionnaires and focus group interviews, data were collected from 154 teachers to explore teachers' noticing of mathematics anxiety, the strategies they use to address it, and the support they receive and need. A key contribution of the study is the identification of three converging patterns across the five country cases: teachers recognized MA in highly similar ways, relied largely on intuitive and experience-based strategies, and reported a shared lack of systematic school-level support. The findings point to the need for further research on how teachers manage MA in classroom practice, including collaboration with parents and specialized staff, and on how teaching cultures shape the identification and alleviation of MA across countries. Further, our findings suggest the need for a comprehensive and context-sensitive professional development that supports teachers in recognizing and addressing MA across educational systems. Suggestions for practice are made that policymakers can address by developing measures for schools, teacher education and teaching professional development programs to adopt.

Keywords: Cross-national study; Mathematics anxiety; Mixed-methods; Professional development; School-level support; Teacher strategies.
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Introduction

Mathematics anxiety (MA) is increasingly recognized as a domain-specific form of academic anxiety that interferes with students' learning, problem-solving, and sustained engagement with mathematics (Ahmmed et al., 2024; Kaushal et al., 2022). It is an emotional reaction characterized by feelings of fear, tension, and apprehension when engaging with mathematical tasks or situations, involving cognitive, emotional, physiological, and behavioural responses that can hinder mathematical performance and lead to avoidance of math-related activities (Huhtasalo et al., 2025). The prevalence of MA across educational systems is substantial. For example, recent large-scale studies estimate that approximately one in six students experience moderate to high levels of MA, with symptoms often appearing in primary education (Hill et al., 2016). Importantly, MA is not limited to low-achieving students; it has been consistently observed across the full range of achievement levels, also affecting students with adequate mathematical skills (Kaushal et al., 2022). Gender differences remain a recurring finding: compared to males, female students report significantly higher levels of anxiety despite comparable performance (Goetz et al., 2013; Zhang et al., 2024; Barroso et al, 2025).

The academic and societal consequences of MA are far-reaching. At the cognitive level, anxiety disrupts working memory and executive functions, reducing flexibility in problem-solving and fostering rigid perseverance with ineffective strategies (Justicia-Galiano et al., 2016; Jiang et al., 2021). Over time, students with heightened MA tend to achieve lower results, show diminished motivation, and avoid advanced mathematics courses, thereby limiting their opportunities for progression in STEM education and careers (Mammarella et al., 2023; Kaushal et al., 2022). The impact also extends beyond formal education: MA is linked to lower confidence and poorer financial knowledge in adults, and lower numeracy proficiency is associated with weaker financial decision-making and reduced participation in the labour market (Skagerlund et al. 2018; OECD, 2024). Collectively, these findings position MA not only as an educational barrier but also as a broader challenge for equity and participation in knowledge-based societies.

Differences among countries in students' MA levels and in the evolution of MA over the past two decades suggest that there is no one-size-fits-all solution applicable across contexts (Foley et al., 2017). PISA results reveal consistent cross-national differences in MA, highlighting the moderating role of cultural factors (e.g., Fan et al., 2019; Foley et al., 2017). Several cultural dimensions - including educational systems, gender stereotypes, expectations held by students, teachers, and parents, as well as school structures and support mechanisms - influence both the levels and distribution of MA within a given cultural context (Foley et al., 2017; Barroso et al., 2020). From this perspective, it can be assumed that the design of effective interventions to alleviate students' MA across countries must consider the multiple actors involved and their specific cultural contexts (Huang, 2025). One of these key actors is the teacher.

Teachers occupy a pivotal role in shaping students' experiences of mathematics. They are often the first to notice signs of anxiety in the classroom, and their knowledge, attitudes, and instructional practices can either mitigate or

exacerbate its effects (Barroso et al., 2020; Kinanda et al., 2024). Gaining insight into teachers' awareness of MA, as well as the strategies they use to identify and address it across countries, is therefore essential for both research and educational practice. Despite the recognition of teachers' central role in designing effective school-based interventions to address MA, research focusing on teachers remains limited. Compared to studies centered on students, relatively few studies examine teachers' perspectives (Barroso et al., 2020), and there is a notable lack of research conducted across diverse cultural and contextual settings (Foley et al., 2017). Furthermore, while many existing studies rely on quantitative methods, mixed-methods approaches are still scarce (Barroso et al., 2020). Consequently, an important research gap concerns how teachers conceptualize MA, which strategies they perceive as effective in reducing it, and the extent to which they feel supported in preventing and alleviating students' MA.

Using a mixed-methods approach, the present study addresses these questions by exploring teachers' experiences and strategies across five European country cases. Each country represents a distinct educational context within a broader European research initiative, the MathifyMe project, involving Finland, the Netherlands, Croatia, Malta, and Portugal. The project aims to equip teachers to help reduce MA among 7-16-year-old students through the development of a digital game and teacher professional development. The following research question guided the study:

- How do primary and secondary school teachers, across the five countries, recognize and understand MA in their classroom practice?
- Which strategies do teachers report as effective in identifying and alleviating MA among students?
- What school support do teachers report as available, and what support do they need to address MA in their practice?

Theoretical background

Mathematics anxiety and control-value theory

MA is not a single, uniform construct but has been defined in several complementary ways. Mammarella et al. (2023) describe it as a multifaceted emotional condition with intertwined cognitive, emotional, behavioral, and physiological dimensions that emerge during mathematical activity. In contrast, Ahmmed et al. (2024) emphasize its psychological core, describing MA as an adverse emotional reaction that disrupts learning and reasoning. From an educational perspective, Kaushal et al. (2022) highlight its practical implications, portraying MA as a context-dependent response that often leads to avoidance and lower achievement. Taken together, these perspectives converge on the view that MA represents a significant barrier to students' sustained engagement with mathematics.

Literature distinguishes between two main perspectives on MA: the trait perspective and the state perspective. The trait perspective views MA as a relatively stable individual difference, reflecting a consistent tendency to experience anxiety in mathematical contexts. Psychological factors, particularly self-efficacy - the belief in one's own mathematical ability - play a central role, with low self-efficacy making students more vulnerable to anxiety and its negative impact on performance. Cognitive and affective traits such as perfectionism and diminished self-confidence

further contribute to vulnerability (Huhtasalo et al., 2025). The state perspective, by contrast, emphasizes its situational nature, describing MA as a context-dependent emotional reaction that varies with task difficulty, assessment conditions, or social context. In this view external factors such as negative teacher feedback, parental pressure, and rigid, performance-oriented instruction emerge as critical environmental triggers (Kaushal et al., 2022; Jiang et al., 2021; Zhang, Li, & Chen, 2024) that can heighten stress, reduce students' sense of control, and ultimately intensify MA (Huhtasalo et al., 2025).

Control-Value Theory (CVT), a theory from cognitive psychology, provides a useful framework for explaining the mechanisms involved in MA (Pekrun, 2024). CVT conceptualizes achievement emotions as emerging from two central appraisal dimensions: perceived control and perceived value. Perceived control refers to learners' beliefs about their ability to influence learning outcomes, meet task demands, and cope effectively with achievement-related activities. Perceived value refers to the subjective significance attributed to an activity or its outcomes, including its importance, usefulness, interest, and perceived cost. According to CVT, specific patterns of control and value appraisals are associated with distinct achievement emotions. For example, high perceived control combined with positive value tends to foster enjoyment, whereas low perceived control in relation to highly valued outcomes may elicit anxiety. Low perceived value is likely to contribute to boredom, while appraisals of failure as uncontrollable may give rise to hopelessness. From this perspective, emotions are not direct responses to learning tasks themselves; rather, they arise from learners' interpretations of those tasks in terms of their manageability and personal significance.

In the present study, CVT provides a framework for exploring teachers' perspectives on the causes, manifestations, and classroom implications of MA. This aligns with a state perspective on MA, which emphasizes the dynamic role of the classroom environment. Together, these perspectives guide our focus on how teachers can recognize and alleviate students' anxiety in instructional settings, while acknowledging that students' personal characteristics and home circumstances shape their perceptions of control and task value in mathematics. Thus, we view MA as closely connected to classroom context, students' perceptions, and the broader learning environment, including teachers, peers, and guardians.

Teacher's influence on students' MA and their role in alleviating MA

Teachers' personal experiences with mathematics, including their own anxieties or gendered beliefs, affect their teaching approach and indirectly influence student MA. While teachers may not explicitly communicate these internal dispositions, their beliefs subtly shape their instructional behavior, emotional expression, and interactions with students, which in turn influence how students perceive and emotionally respond to mathematics (Caglar & Senol, 2021; Luttenberger et al., 2018). As O'Leary et al. (2017) point out, students often recall that their most anxiety-provoking mathematics experiences were associated with teachers who appeared uncomfortable with the content, who were quick to correct mistakes, or who lacked flexibility in their instruction. Polacco et al. (2023) support this perspective by reporting that negative teacher attitudes toward mathematics, including a lack of

confidence and rigid instructional approaches, are perceived by students as indicative of the subject's difficulty or exclusivity. This perception can lead students to believe that success in mathematics requires a special kind of talent, which intensifies their anxiety when they encounter challenges and reinforces students' own negative perceptions of mathematics.

Furthermore, teachers holding stereotypical views (e.g., "boys are better at mathematics") often set lower expectations for girls, reinforcing anxiety and disengagement (Evangelopoulou et al., 2023). Teacher aggressiveness and emotional volatility, such as scolding, shaming students or using high levels of punishment, are prominent triggers of MA (Kinanda et al. 2024; Westphal et al., 2018). Students in such environments tend to fear participation and associate mathematics with punishment.

Conversely, studies also show that supportive, encouraging, and emotionally intelligent teacher attitudes can significantly reduce MA. Teachers who foster trust, relevance, and self-efficacy reduce anxiety and enhance students' willingness to engage (Baas, 2020). Klee et al. (2021) suggest that teachers who promote autonomy, mastery goals, and emotional safety create learning environments where students are less anxious and more motivated. Teachers' emotional support is especially important, showing a stronger association with mathematics attitudes than parental support, assistance, or expectations (Davadas & Lay, 2017). Such support helps create a classroom climate that encourages positive emotions and reduces anxiety (Kinada et al., 2024; Li et al., 2021; Pekrun, 2024). Longitudinal findings suggest, however, that students' own attitudes and anxiety also shape how much support they feel they receive. Luo et al. (2023) reported that attitudes and anxiety predicted later perceptions of teacher support, while teacher support did not predict subsequent changes in attitudes or anxiety. These results point to the value of addressing students' attitudes and anxiety early, alongside strengthening teacher support, to foster a more positive learning environment.

In addition to emotional support, the redesign of instructional practices is important. The diagnostic skills of mathematics teachers are associated with lower average anxiety in the classroom, meaning that students experience less fear when teachers are better at recognizing their difficulties and adjusting the pace of instruction (Westphal et al., 2018). Timely and formative feedback from teachers can help students promptly adjust their understanding, which in turn can enhance their perceived control and reduce their MA (Fergus & Smith, 2022; Pekrun, 2024). Caglar and Senol (2021) report that teachers who employed real-world applications, game-based learning, and collaborative problem-solving created environments in which students were more willing to take risks and less likely to experience debilitating fear. Research also suggests that moderate amounts of mathematics homework are associated with optimal achievement, whereas excessive homework under pressure can increase MA, particularly among less motivated students (Qin & Wang, 2025). For instance, around 45 minutes of daily mathematics homework yields the best performance, whereas both very low and very high amounts are linked to poorer outcomes.

In line with these findings, Evangelopoulou et al. (2023) argue for systemic inclusion of MA content in teacher education programs. Increasing teachers' awareness of the cognitive, emotional, and physiological components of MA, together with training in scaffolded and individualized instruction, can help prevent the unintentional reinforcement of anxiety and foster more inclusive and emotionally responsive teaching practices.

Methodology

Research Design

This multiple case study design (Yin, 2003) employed a mixed-method approach to explore teachers' perceptions, experiences, strategies and perceived support regarding MA identification and alleviation. Specifically, we employed a cross-case analysis of teachers' perceptions in the five countries in which quantitative questionnaire data (N = 129 teachers) and qualitative group interview data (N = 6 groups, 25 teachers) were analysed separately and then integrated at the interpretation stage. A distribution of the participants among the qualitative and quantitative parts of the study and the countries are provided in Tables 1 and 2. The units of analysis were the teachers in the five countries. Within each of these five case studies, data on variables such as teachers' knowledge, teachers' practices and school support were used for our cross-case analysis. The samples are non-overlapping but drawn from the same population (primary and secondary teachers in Finland, the Netherlands, Malta, Croatia, and Portugal).

Quantitative methods of data collection were used to provide a broad overview of the actual state of teachers' views on these matters. Then qualitative methodology was applied, as it allows for in-depth exploration of teachers' lived experiences and provides rich insights into their understanding of MA within classroom contexts (Creswell & Poth, 2024). Both quantitative and qualitative approaches address the same overall phenomenon, from different perspectives and therefore were given approximately equal priority. A convergent mixed-methods design was employed, where quantitative survey results and qualitative interview narratives were woven together in the reporting of the results to provide a comprehensive and nuanced understanding of each theme.

Context, participants, and sampling procedures

Participants of both studies (questionnaire and group interview) were recruited through purposive sampling from the five countries involved in the project. This multi-country approach was chosen to capture diverse educational contexts and different countries' perspectives on MA. The recruitment and sampling procedures followed a similar procedure across countries to be comparable. Specifically, teachers participating in the online questionnaire were reached through a combination of local, regional, and national educational networks and channels. Participants in the qualitative study comprised teachers from partner schools involved in the project. Each partner country contacted the partner school, presented the project and the research, and asked whether teachers would be willing to participate in the focus group interviews.

Participants in both studies were all qualified teachers to teach at the level they were teaching, working in primary or secondary education, and having direct classroom experience with students who may experience MA.
Table 1 provides an overview of the number of teachers included in each study and country. Table 2 summarizes the number of teachers who completed the questionnaire and participated in interviews, organized by country and grade level. Many teachers who completed the questionnaire taught more than one grade; therefore, the frequencies shown in Table 2 do not refer to mutually exclusive groups of teachers.

Table 1

Number Of Teachers Who Participated In The Questionnaires Or Interviews

	Finland	**Netherlands**	**Croatia**	**Malta**	**Portugal**	**Total**
Questionnaire	17	22	49	28	13	129
Interviews	7*	7	5	2	4	25

Note: *Two groups of teachers

Table 2

Grade Levels Taught By Teachers Who Responded To The Questionnaire Or Interview

	Finland	**Netherlands**	**Croatia**	**Malta**	**Portugal**	**Total**
Questionnaire						
1st - 3rd grade	4	0	8	0	10	62
4th - 6th grade	7	0	23	2	0	70
7th - 9th grade	6	22	18	26	0	116
Interview						
1st - 3rd grade	4	0	0	0	4	8
4th - 6th grade	3	0	5	0	0	8
7th - 9th grade	0	7	0	2	0	9

Questionnaire

The online questionnaire (Appendix 1) consisted mainly of multiple-choice questions, with options for respondents to explain their answers. The questionnaire was developed by the authors in alignment with the research aims and questions and was based on a review of the existing literature, which formed the theoretical basis for the items. Prior to wider distribution, the questionnaire was piloted with four Finnish teachers, and minor modifications were made based on their feedback. To ensure linguistic and cultural equivalence across the multiple countries, the questionnaire was initially developed in Finnish and then translated into English. Following collaborative discussions among the international research team to refine the English version, researchers in each participating country translated the questions into their respective native languages.

The questionnaire was distributed in each country between April and May 2025. Of the teachers who responded to the questionnaire, 10,9 % had been teaching for less than five years, 15,5 % had been teaching for 5 -10 years, and the remaining 73,6 % had been teaching, for more than ten years. The high proportion of experienced teachers offered valuable insights, as these teachers were able to describe how they had experienced the phenomenon of MA developing in students over time. The questionnaire was answered by teachers who teach only mathematics and mathematics-related subjects (57,4%), as well as teachers who teach mathematics but also other subjects (42,6 %). From the perspective of the study, it was important that a large number of teachers of both types responded to the questionnaire.

Focus groups interviews

The interviews addressed the main research topics, including teachers' observations and experiences of MA, strategies for alleviating it, perceptions of school support, and professional development needs. Group interviews were chosen to encourage discussion amongst the teacher-participants of their classroom practices. The interviews were conducted in June 2025 in all five countries using a standardized semi-structured protocol to ensure consistency while allowing cultural and contextual adaptations. They were conducted in person in participants' native languages by two MathifyMe researchers in each country, with groups of two to seven teachers depending on availability (Tables 1 and 2). Interviews lasted approximately 45–60 minutes. One moderator led the interview, while the other recorded the discussion, took notes, and monitored time, although both contributed when appropriate. With participants' informed consent, the interviews were audio-recorded and transcribed for analysis. Participation in the questionnaire was not required for participation in the interviews.

Data analysis

Quantitative data such as the teachers' answers to the multiple-choice items and closed questions from the questionnaire were analyzed using descriptive statistics. The qualitative analysis to the open questions of the questionnaire and from the interviews employed a hybrid approach combining both inductive and deductive thematic analysis, as outlined by Braun and Clarke (2006). This approach allowed for the identification of themes emerging directly from the data whilst also enabling examination of concepts informed by existing theoretical frameworks on MA and teachers' practices.

The analysis began with repeated reading of the transcripts to become familiar with the data. Initial codes were generated inductively, capturing both semantic and latent meanings in teachers' responses. These codes were then organised into potential themes and refined iteratively. To enhance rigour, multiple researchers independently analysed parts of the data, and discrepancies were resolved through consensus. A deductive component was also included, guided by the research questions and existing literature on MA and teachers' practices. The first author led the final refinement to ensure that themes and categories were consistent and clearly defined. Finally, the quantitative and qualitative findings were compared, contrasted, and integrated.

To enhance context validity, the analysis of the data was conducted in the language of each country by the researchers of each country (also authors in this paper). The results were then translated into English, and the findings were synthesized using the English language. The final thematic structure of the qualitative data was developed collaboratively, ensuring that themes accurately represented the data whilst addressing the study's research objectives. In Appendix 2 we present an extended version of Table 3 with the categories and examples at the level of each country.

Table 3

Overview Of The Themes And Categories Identified In The Data Across Countries

Themes	Description	Categories
Teachers' views on MA		
MA as a multidimensional phenomenom	Physical, behavioural, and cognitive dimensions. Freezing, stuttering, withdrawing from interaction, repeatedly asking for confirmation are some common signs.	Symptoms of anxiety Terminology
Influence of early experiences and the environment	Emerges early, and it is shaped by personal and systemic factors (teachers, parents, stereotypes). It can change over time as feelings about mathematics are not fixed.	Sources of anxiety Evolution over time
Assessment is a triggering factor	Formal and informal assessments are major triggers of anxiety across ability levels.	Triggers of anxiety
MA impacts negatively students learning	Participation, social interaction, performance, engagement. Over time leads to knowledge gaps and learning deficits.	Impact on learning
Teachers' strategies to alleviate MA		
Positive feedback and encouragement	Positive feedback and encouraging students to try and persist.	Positive feedback Encouragement
Reduction of assessment pressure	Low-stakes testing and gradual progression to more difficult tasks	Adaptation of assessment
Repetition and practice	Frequent repetition	Repetition and practice
Individualization and differentiation	Tailoring tasks and pace to individual students	Individualization and differentiation
Creative adaptation of pedagogical strategies	Involves adaptation learning processes such as curriculum changes or using more student-centered approaches	Pedagogical approaches
Providing emotional support	Creating a safe and supportive environment during stressful moments and a sense of belonging.	Safe environment and breaks
Collaboration with parents	Family involvement in addressing MA	Collaboration with parents
Teachers' perceptions of support and their needs		
Systemic gaps	Lack of resources and structured support to help students and equip teachers to identify and address MA	Systemic gaps
Support needs	Forms of needed school support, resources and/or training to address MA	Support needs

Given the relatively small and uneven purposive samples, the resulting findings of this study should be interpreted as exploratory insights into teachers' practices across multiple European contexts, rather than as representative cross-country or cultural comparisons.

Results

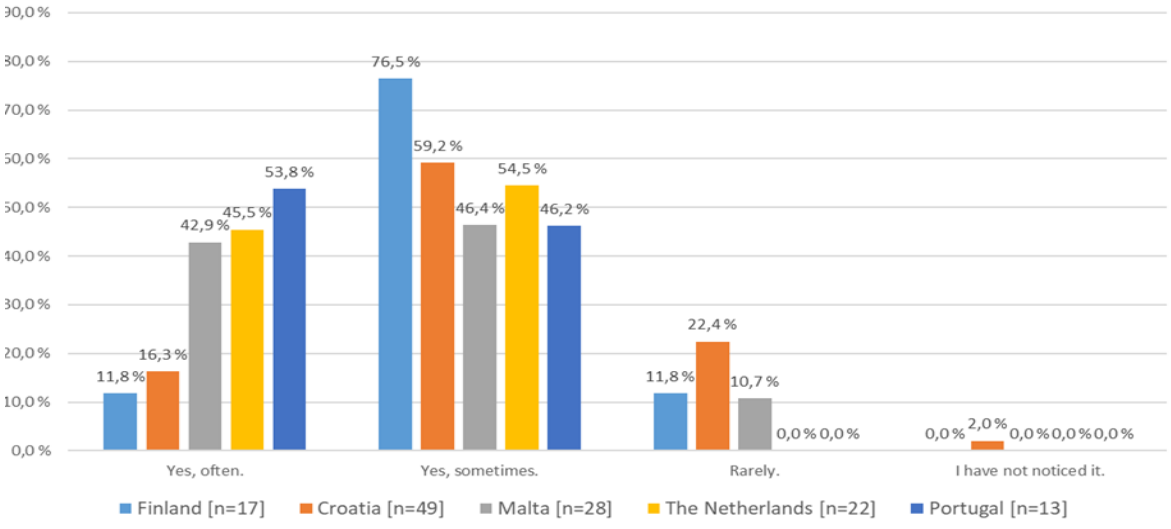
How do teachers recognize and understand MA in their classroom practice?

MA is a multidimensional and context-dependent phenomenon

Teachers across the five countries recognized MA as a common issue in mathematics classrooms, although their accounts show that it is not always easy to identify. Teachers referred to a range of emotional, cognitive, and behavioural responses. This was evident in the questionnaire results, where teachers reported noticing MA among students to varying degrees across countries (Figure 1), and was further elaborated in the interviews, where all teachers described encountering MA in some form in their classrooms. Teachers did not associate MA with a single, fixed student profile. Instead, they described it as something that may manifest differently depending on the student and the specific situation. This aligns with the view that MA is context-dependent (Kaushal et al., 2022). Some students withdraw, remain silent, or avoid mathematical tasks, while others show nervousness, lose concentration, freeze, or express negative emotions toward mathematics: "some freeze completely, while others try to distract themselves or their classmates. The reactions are very individual" (Croatia).

Figure 1

Teachers' Acknowledgment Of MA In Their Students

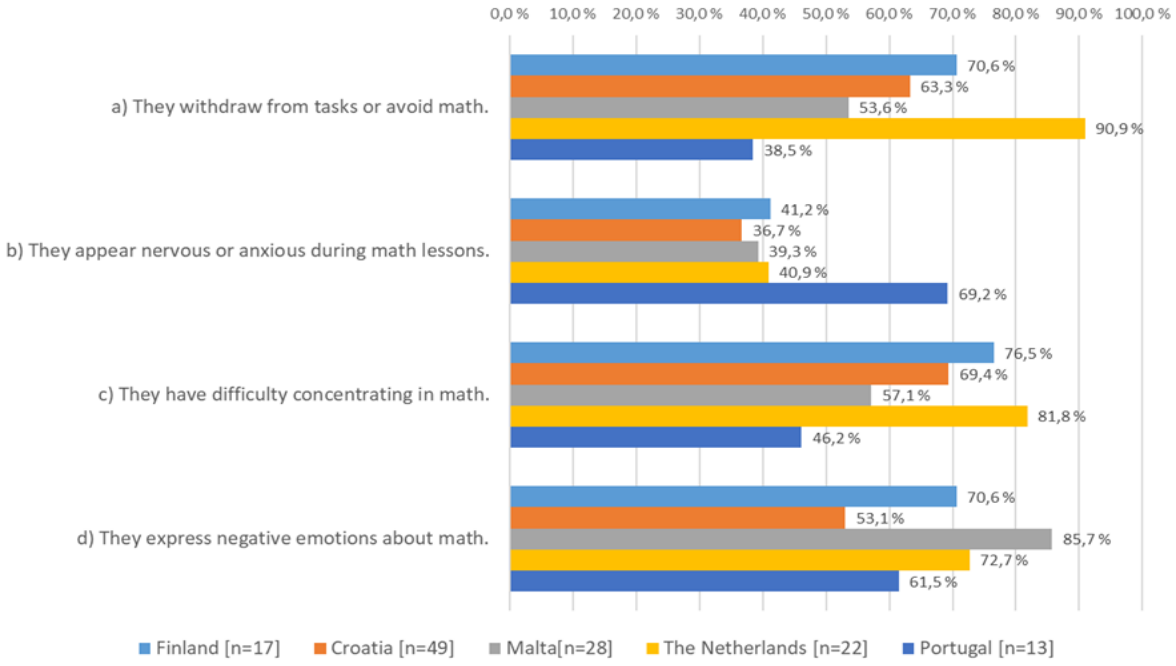


The questionnaire findings shown in Figure 2 also support this interpretation, as several indicators of MA were reported simultaneously across countries. Although the frequency of particular signs varied, teachers' views of how MA appears in students were broadly similar. Expressions of negative emotions toward mathematics were recognized by at least half of the teachers in all five countries. Withdrawal from tasks, avoidance of mathematics, and difficulties concentrating were also reported by at least half of the teachers in Finland, Croatia, Malta, and the Netherlands. In Portugal, teachers reported less withdrawal and task avoidance, but more visible nervousness or

anxiety during mathematics lessons. One possible reason for this difference may lie in differences in teachers' classroom practices. In Portugal, where classroom interaction and discussion are more common than independent work, students may be more likely to display nervousness or fear when asked to answer mathematical questions on the spot. This difference suggests that teachers' instructional practices may play a role in the identification of MA in classroom practice.

Figure 2

Teachers' Perceptions Of How Students Exhibit MA



Teachers also stressed that recognizing MA requires sensitivity to context. Withdrawal or silence, for example, was not always interpreted as evidence of MA: "It can be difficult to distinguish MA from other personality traits or social fears. Withdrawal or silence may not always be about mathematics" (Finland). The importance of context was also evident in the discrepancy between school and home. Some students appeared calm during mathematics lessons, while signs of distress became visible only outside the classroom: "There have been students who don't show any signs of anxiety at school, but then we get a message from home saying that they threw a book against the wall again" (Finland).

These examples show that teachers' recognition of MA depends not only on their observations of students in class, but also on their professional judgement and on their communication with parents. This is a critical finding because of its implications for practice.

MA is shaped by early experiences, family, social messages and assessment

Teachers also described MA as something that develops over time and is shaped by previous experiences, family messages, classroom situations, and broader social expectations. In the interviews, teachers across countries linked MA to early negative experiences with mathematics. One teacher in Portugal described her own experience of losing motivation in the first year of middle school after failing to grasp foundational concepts, which affected her performance for years. Such accounts show that teachers viewed MA as cumulative: early difficulties or negative experiences can gradually influence students' mathematical self-image and expectations of failure.

Teachers did not view MA as something fixed. Several teachers described students' feelings about mathematics as changeable and developmental: "there are also students who at first may find it [mathematics] rather difficult. But in the end, they pick it up, so it's nice that you see them develop in that. So, they still grow. So, it can. It's not always the case that it's suddenly gone, but you do see a development" (the Netherlands). This points to teachers' understanding of students' MA as dynamic. With appropriate support and positive experiences, students' relationship with mathematics can change over time.

Parents and family messages were also described as important influences. Teachers noted that students may internalize messages suggesting that mathematics is inherently difficult or that mathematical ability is fixed. One teacher in Finland observed that parental comments such as "I was never good at mathematics" or "no one in our family has ever been any good at math" can send students the message that mathematics is difficult, and that this message remains with them. Teachers also referred to gender-based stereotypes and social pressure, linking this to lack of confidence and social expectations: "The girls do suffer more with anxiety in mathematics" (Malta). Assessment emerged as a particularly strong trigger of MA. In teachers' accounts, assessment was more than a way of measuring performance, and it included other classroom activities that could trigger students' emotional responses to mathematics. Teachers described formal tests, surprise assessment tasks and even the language of assessment as situations that could activate anxiety: "if I use the word 'task,' or 'test,' or 'we're going to do an activity,' … that really starts to trigger the panic in students" (Croatia). Assessment-related pressure may therefore intensify MA even before students begin to engage with the mathematical content itself.

These accounts suggest that teachers were aware of the influence of early experiences, as well as wider cultural, parental, and social messages, in shaping students' beliefs about who is expected to succeed in mathematics and in the development of MA. Within these accounts, classroom situations that students perceived as forms of assessment emerged as particularly strong triggers of MA.

MA is a barrier to participation, self-confidence, and learning

Teachers described MA as a barrier to mathematical development that affects not only performance, but also participation, confidence, and learning. The questionnaire results showed that teachers associated MA with difficulty

focusing on tasks, lower-than-expected test performance, and avoidance of participation in mathematics lessons (Figure 3). The interview data helps explain how these effects are connected.

Teachers described anxiety as limiting students' willingness to take part publicly in mathematical activity. Anxious students may refrain from asking questions, avoid coming to the board, or withdraw from classroom interaction: "When a student is anxious, they withdraw. They stop asking questions, they avoid coming to the board, and eventually they fall behind because they're not engaging with the material" (Croatia). In this way, MA can reduce students' learning opportunities by preventing them from taking part in meaningful interactions that support mathematics understanding.

Teachers also emphasized that MA could prevent students from showing knowledge they already possess. A teacher noted, "the anxiety creates a barrier. Even if they understand the concept, they can't demonstrate it because the fear takes over" (Finland). Lower performance was therefore not always interpreted as a lack of knowledge, but as the result of anxiety interfering with students' ability to access and communicate what they know.
For the reasons outlined above, teachers' accounts position MA as an obstacle to mathematical development and classroom belonging. Over time, this may contribute to knowledge gaps, reduce students' self-confidence, and reinforce negative self-perceptions in mathematics.

Which strategies do teachers report as effective in identifying and alleviating MA among students?

Across all countries, at least two-thirds of teachers reported using positive encouragement and reducing assessment pressure to address MA in their classrooms (see Figure 4). At least half of the teachers in Finland, Croatia, Malta, and Portugal reported incorporating games and interactive learning methods in their practice. Conversely, very few teachers in the Netherlands reported using these activities. One possible explanation is that teachers in the Netherlands typically follow the textbook more closely and use fewer out-of-the-book activities. Discussing students' feelings about mathematics was used most frequently by teachers in the Netherlands and Croatia and less commonly in the other countries, whereas giving students extra time was more commonly reported by teachers in Finland, Malta, and Portugal. Fewer than 12% of teachers reported not consciously using specific strategies.

The interview data provided rich elaboration on these strategies and revealed additional ones. Seven main strategic approaches to intentionally alleviating MA emerged from the qualitative analysis. Some of these strategies built on those already mentioned in the questionnaire: *positive feedback and encouragement*, and the *reduction of assessment pressure.* Others extended questionnaire responses, such as *individualization and differentiation*, which expanded on the idea of giving students extra time; *creative pedagogical approaches*, which extended the use of games and interactive learning methods; and *emotional support,* which elaborated on the discussion of students' feelings. Two new strategies also emerged from the interview data*: repetition and practice*, and *collaboration with parents*.

Figure 3

Teachers' Perceptions Of The Effect Of MA On Their Students

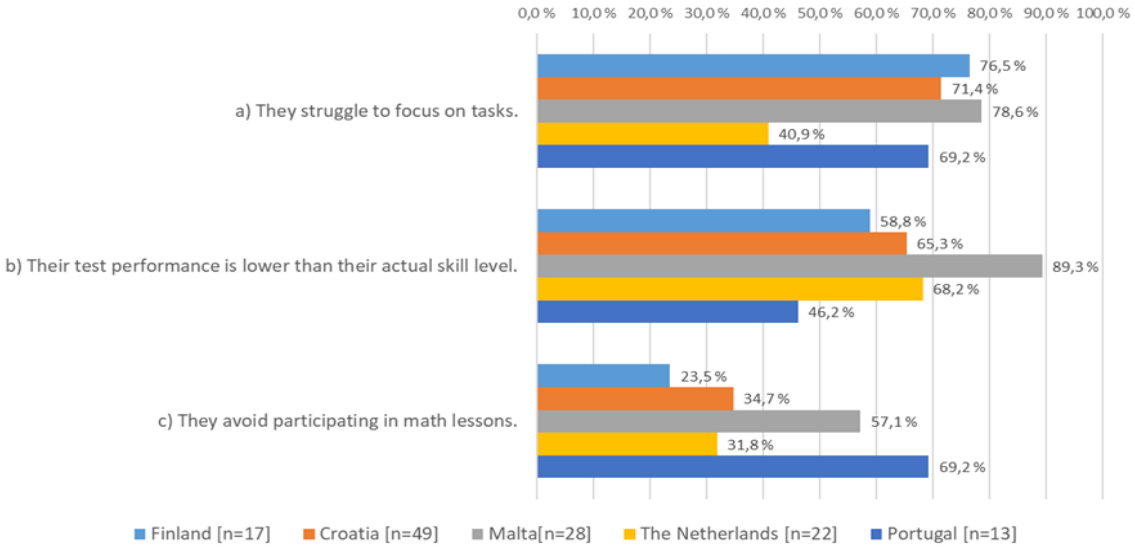
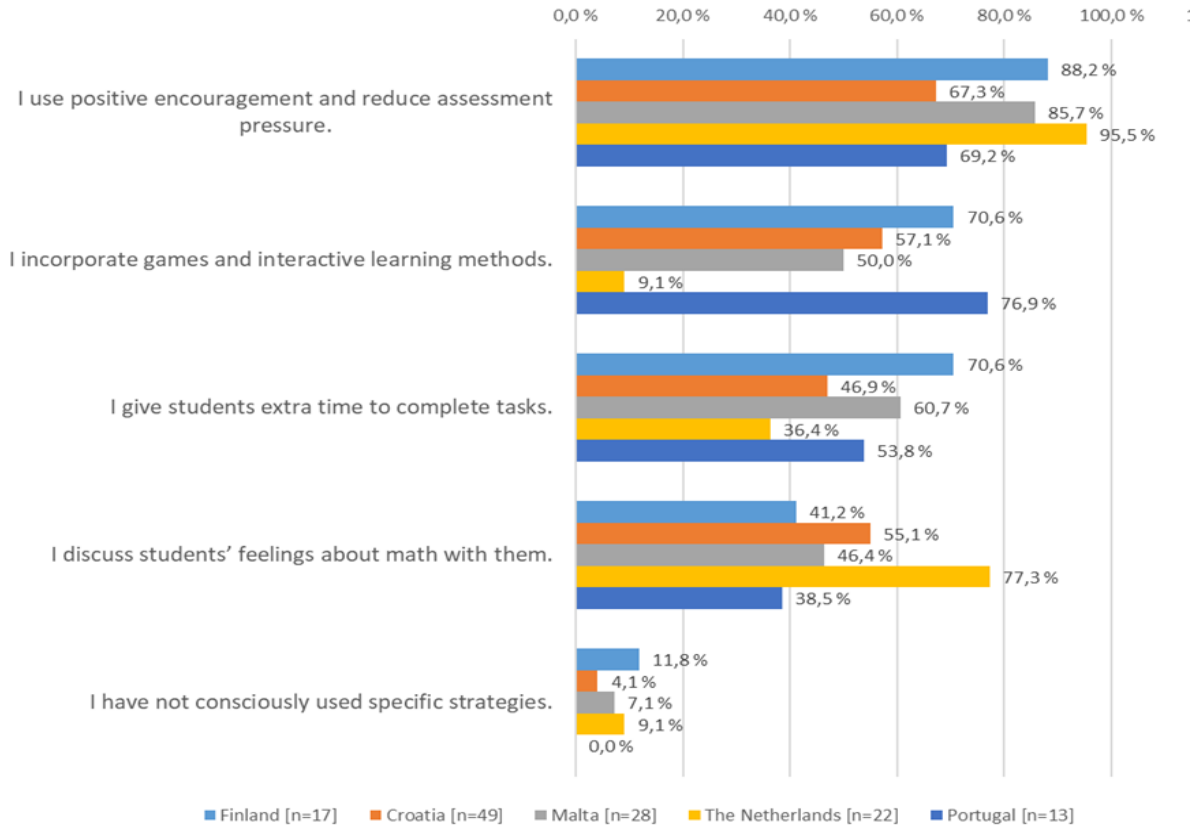


Figure 4

Teachers' Used Strategies To Reduce MA In Their Classroom



Positive feedback and encouragement

Teachers across countries emphasized the importance of highlighting positive aspects of students' work, praising effort rather than performance, and using encouraging language. As one teacher in Croatia explained: "I try to find something positive in every attempt, even if the answer is wrong. 'Good try,' 'You're thinking in the right direction'; these small words matter." A teacher in Finland similarly reported: "praising effort rather than just the correct answer helps them see that the process matters, not just getting it right." Teachers also reported encouraging risk-taking and explicitly normalized mistakes as a natural part of learning: "I encourage them not to be afraid of making mistakes, to dare to come to the board, to try, to talk, and even to make mistakes" (Malta).

Reduction of assessment pressure

Teachers reported that modifying assessment practices is a key strategy for reducing performance pressure and enabling students to demonstrate their true competence, which is in line with their view of MA as shaped by the classroom context and assessment situations. They described using low-stakes assessments and informal oral questioning to make evaluation less intimidating: "I give them the chance to show their knowledge orally" (Croatia); and offering retest possibilities to help students approach exams in a calmer state: "you'll take the test now, and if the grade isn't good enough, you can retake it… they take the test in a much more relaxed way" (the Netherlands). Teachers also avoid situations such as placing a student in a lower-level performance group or acknowledging that they are giving students a lower-level task: "I also think that makes the fear of failure worse. If I say, 'You can't do it,' they feel it" (the Netherlands).

Repetition and practice

Teachers frequently identified repetition and practice as essential for helping students internalize procedures, reduce uncertainty, and increase self-confidence: "repetition is key. When they've done something enough times, it becomes automatic, and the fear reduces" (Finland). Similarly, a teacher in Croatia observed: "practice doesn't just build skill; it builds familiarity, and familiarity reduces anxiety."

Individualization and differentiation

Other strategies mentioned by teachers in all countries that could increase students' participation and learning opportunities were related to adjusting the difficulty level, providing one-on-one support, and allowing students to work at their own pace. A teacher explained: "I try to give them tasks that match their level, not too hard, not too easy. And if they need me to explain it again in a different way, I do that" (the Netherlands). One teacher from Malta noted: "every child learns differently (…). I adjust my approach based on what I see working."

Creative pedagogical approaches

Teachers across all countries noted that variety in pedagogical approaches helps to keep students engaged, provides multiple entry points into the content, and creates opportunities for peer modelling and support. This variety aligns

with their view of MA as a multidimensional and context-dependent phenomenon. For instance, teachers described using visual aids to support students' understanding of abstract content, as illustrated by the comment: "I do a lot of drawings for them to understand" (Portugal). Other examples included task stations, partner work, and role-switching to renew students' interest and encourage collaboration (Finland), as well as playful activities in Portugal and the Netherlands to make learning less intimidating.

Providing emotional support

Emotional support emerged as a critical dimension of teachers' practice. Teachers consistently reported that establishing a safe and supportive classroom environment is essential for addressing MA. They described efforts to ensure that every student feels accepted and valued, regardless of achievement level: "The most important thing is that every child in class feels good, noticed, and successful, regardless of grades" (Croatia). Teachers highlighted the importance of acknowledging students' emotional experiences and discussing these emotions when necessary: "often students come to you after class. They are completely stressed or say that they are so afraid of the tests." (the Netherlands).

Teachers frequently emphasized the importance of allowing students time to reset when anxiety becomes overwhelming. For instance, by using short physical breaks, such as sending students for a walk or to drink water, to help them calm down and re-engage (Croatia), using "small hints or small breaks" to lower tension and gradually build confidence (Malta).

Collaboration with parents

Teachers highlighted the importance of engaging parents to address MA and improve students' progress in mathematics. This involves aligning school approaches with home approaches: "when a parent understands our approach and sees where the child is making mistakes, then together we can make progress" (Croatia). It also involves spending significant time explaining learning processes to parents to ensure that expectations are realistic and supportive: "we spend a lot of energy explaining to parents how children actually learn" (Malta). By engaging parents and addressing these messages, teachers aim to foster a more positive mathematical identity in students and to break cycles of intergenerational mathematics avoidance, which aligns with their view of MA as a context-related phenomenon and shaped by the family narrative and social expectations.

What school support do teachers report as available in their practice, and what support do they need?

Teachers' perceived support to address MA in practice

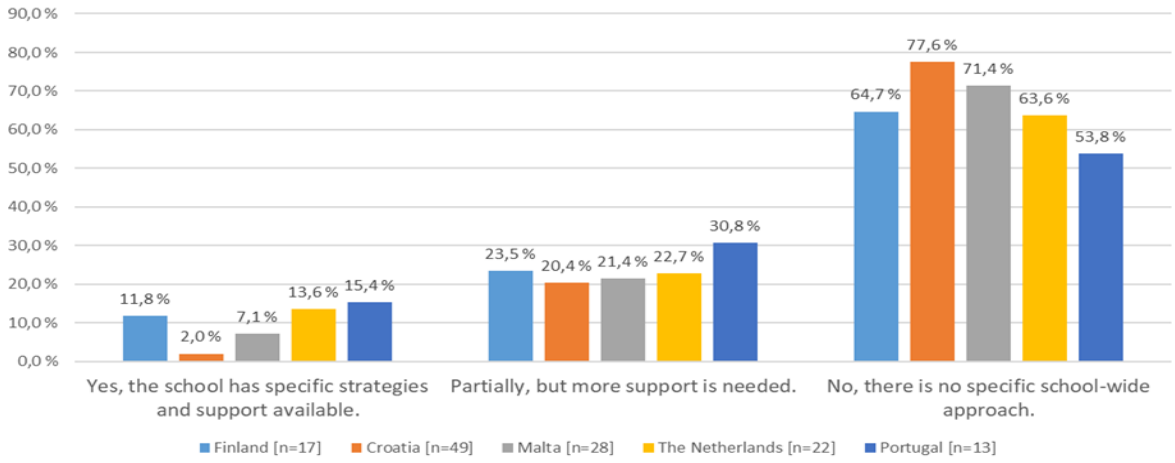
Although there were differences in teachers' practices across countries, teachers' perceptions of school support were quite similar (see Figure 5). More than half of the teachers in all countries reported the absence of a specific school-wide approach, and about one quarter reported that support was partially available, but that additional support was needed. In only a few cases did schools have specific strategies and support available (less than 15%).

This finding aligns closely with insights from the interview data, which revealed significant systemic gaps. Teachers pointed the absence of structured programmes and formal protocols and that they must improvise when addressing MA: “There are no written, applicable protocols… everything relies on our own judgment.” (Croatia), “we don’t really [have practices]. Everyone must fend for themselves.” (Malta). In addition, teachers are aware that the support they give to students offers a solution in the short term but that the problem runs deeper:

“So if you actually want to know that they have the right answer to it, you hope to increase self-confidence in this way. That’s actually a snapshot. Because it doesn’t take away the mathematics fear that runs deeper, does it? So it is a moment of success for the students, but it is not a lasting effect” (the Netherlands).

Figure 5

Teachers' Perception Of School Support To Reduce MA



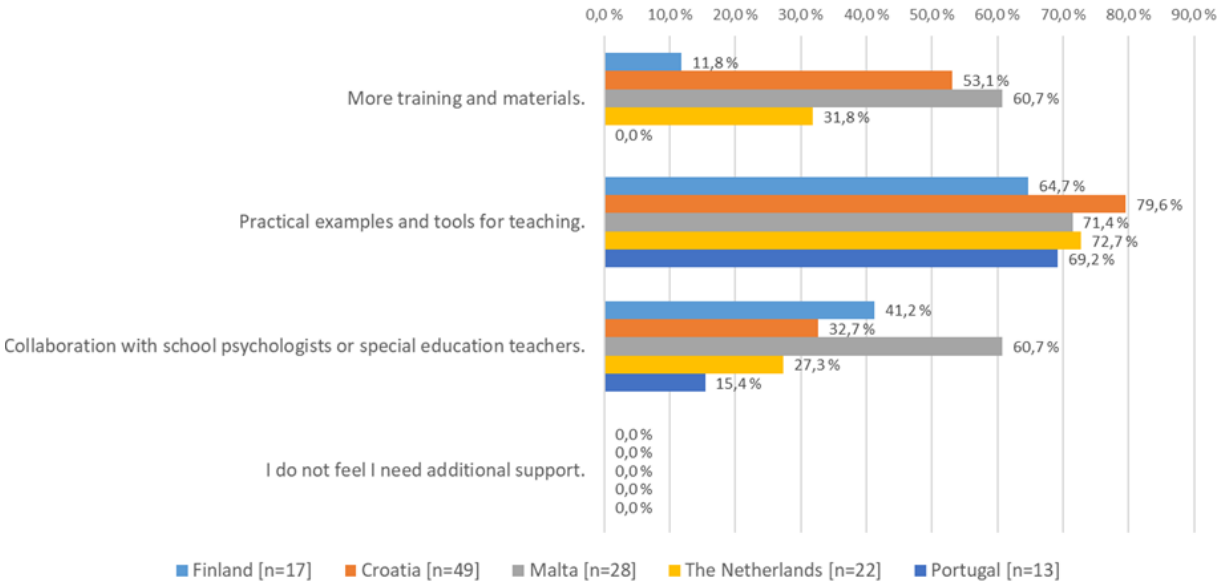
Teachers’ needs and preferences for support to address MA in practice

Teachers were also asked about the types of support they would like to receive to help address MA (see Figure 6). At least two out of every three teachers in all countries expressed a preference for practical examples and teaching tools, making this by far the preferred form of support. Additional professional development opportunities and instructional materials were preferred by at least half of the teachers in Malta and Croatia, but much less so by teachers in Finland and the Netherlands, and by no teachers in Portugal. Collaboration with school psychologists or special education teachers was preferred by fewer than half of the teachers in all countries, except for teachers in Malta. No teacher reported not needing support.

These preferences were echoed and elaborated on in the interviews. Teachers valued the provision of practical knowledge: “I would need practical examples that have also been proven effective” (the Netherlands). They also expressed interest in collaboration with special education: “[special education teacher] could take one group, for example, or work with the teacher, providing support and additional assistance,” which were aspects pointed to in the quantitative results.

Figure 6

Teachers' Perception Of Needed Support To Manage MA



Teachers also pointed to structural conditions that affect their ability to address MA in practice such as the challenge of large class sizes: “If you have a smaller group, then it’s possible. But if you have such a child in a large group… Imagine you help them for 10 minutes, then again a quarter of an hour later, and maybe once more near the end. These are many moments. It just isn’t possible.” (the Netherlands). Teachers noted the importance of having more time to support the students: “If we had six lessons instead of five, and the sixth lesson would be a tutorial… where you actually help the kids” (Malta). The need for more information about their students and collaboration with parents was also highlighted.

Discussion

A central contribution of this study is the identification of three converging patterns across five European country cases. Despite differences in national educational context, teachers recognized MA in highly similar ways, reported using mainly intuitive and experience-based strategies to support students, and consistently described a lack of structured school-level support. These findings are particularly noteworthy because they suggest that MA is not only an individual student-level issue, but also a pedagogical and systemic challenge requiring support at teacher, school, and policy levels.

Teachers’ views and understanding of MA

The first research question regarded the way primary and secondary school teachers, across the five countries recognize and understand MA in their classroom practice. Based on the findings we can state that teachers in the five

countries recognized MA in highly similar ways. They view MA as a multidimensional and context-dependent phenomenon that is revealed in many forms. The view of MA as a multidimensional phenomenon resonates with the view of MA as a multifaceted and emotional condition (Mammarella et al., 2023). The importance of the context, avoidance behaviour and lower achievement were also reported by Kaushal et al. (2022). The high reported noticing of MA in all countries; independent of the country, supports evidence from research that MA is a worldwide phenomenon affecting children from all countries (e.g., OECD 2023). Our findings confirm not only the prevalence of MA across different educational systems and countries, as it shows that teachers recognize its multifaceted and contextual nature.

Further, teachers view MA as a phenomenon shaped by early experiences, assessment, and parental and social messages. They identified both formal and informal assessments as primary triggers of anxiety. From a CVT perspective (Pekrun, 2024), assessment situations may reduce students' perceived control, especially when they are unexpected, thereby increasing anxiety. The combination of different factors may further intensify state anxiety. For instance, parental pressure can inflate the perceived value of assessment, making failure feel more consequential.

Reflecting on the few differences found in teachers' perceptions of MA across countries, we suggest that these differences may be partly explained by cross-country variation in instructional practices. Previous research shows that teachers' instructional behaviour is related to how students perceive and emotionally respond to mathematics (Caglar & Senol, 2021; Luttenberger et al., 2018). It is therefore plausible that students' signs of MA are shaped, at least in part, by the instructional practices commonly used in their classrooms. For example, in countries where independent work is more common, such as the Netherlands, Malta and Finland, students with MA may be more likely to show withdrawal or difficulties concentrating during mathematical tasks. In contrast, in countries where classroom interaction and discussion are more common, such as Portugal, students may be more likely to display nervousness or fear when asked to answer mathematical questions on the spot, as they may experience less control over the situation (Pekrun, 2024). This finding highlights the need for future research on how different instructional practices shape the behavioural expression and identification of MA.

Teaching strategies for addressing MA

The second research question regarded the strategies that teachers considered effective in identifying and alleviating MA among students. Our findings showed that teachers in all countries reported using mainly intuitive and experience-based strategies to support students. We identified seven main strategies that teachers used simultaneously and that were consistently supported by both the quantitative and qualitative results. Interestingly, very few teachers reported not using any strategies, suggesting that, although teachers may not be formally prepared to alleviate MA, they often address it instinctively in their classroom practice.

The seven strategies used by teachers shared a consistent pedagogical focus on promoting positive learning experiences. These strategies were intended to increase students' participation, expand learning opportunities, enhance

self-confidence, and mitigate MA. From the perspective of CVT, strategies as positive encouragement, individualization, differentiation, and emotional support can be understood as mechanisms for strengthening students' perceived control over mathematical tasks or situations. Teachers also reported using strategies aimed at reducing assessment pressure such as low-stakes testing, retest options, and informal oral questioning. These approaches may reduce the perceived threat or stakes associated with assessment, thereby lowering anxiety while maintaining students' engagement.

The use of creative pedagogical approaches that provide multiple entry points into mathematical content, while also offering social support, can be understood from a CVT perspective as supporting both students' perceived task value and sense of control. Our findings also illustrate teachers' awareness that a psychologically safe environment is a prerequisite for students' willingness to participate and persist in mathematics learning. In terms of CVT, such features of the learning environment may strengthen students' perceived control. In addition, collaboration with parents may enhance both perceived control and task value by creating more consistent support across home and school contexts.

Teachers in our study were aware that they cannot solve the problem of MA on their own. Because they recognized that parents have a strong influence on students' experiences with mathematics, collaboration with parents emerged as a critical strategy to address MA in practice. Parents could provide additional perspectives and information about students that might not be visible at school. At the same time, teachers believed that parents could also contribute to, or even trigger, students' MA. Students do not enter mathematics instruction from a common starting point. In some families, strong academic support fosters confidence and persistence, as parents provide encouragement and practical help. In others, such resources may be limited, particularly when parents themselves struggle with mathematics or experience anxiety that is, consciously or unconsciously, transmitted to their children (Rada & Lucietto, 2022). In households where high academic success is strongly emphasized, children may instead face performance pressures that heighten their vulnerability to MA (Kaushal et al., 2022). Furthermore, recent findings suggest that home learning environments and parental expectations can contribute to gendered experiences of MA, with female students often reporting higher levels of anxiety despite performing at comparable levels to their male peers (Levy et al., 2021; Zhang, Liu, & Wang, 2024). For these reasons, collaboration between teachers and parents is essential for developing a more complete understanding of students' MA and for creating consistent support across home and school contexts.

However, some strategies used by teachers may not always be effective for students with MA. For instance, in the interviews, teachers frequently identified repetition as one of the most effective ways to consolidate knowledge and reduce MA. However, rigid instructional approaches may be interpreted negatively by students and may increase their MA (Polacco et al., 2023). The CVT perspective helps explain students' potentially negative reactions to repetition. In principle, repetition can strengthen students' sense of control by increasing familiarity with mathematical content. However, when task value is low, repeated tasks may be experienced as boring or meaningless, leading to negative emotional responses. Moreover, if repetition involves tasks that are too difficult, it may reduce students' perceived control and increase mathematics anxiety.

Taken together, the interviews made clear that teachers were not fully familiar with the topic of MA, had not received specific professional development on it during their education or professional careers, and were aware of the influence of context and past experiences, they lacked structured and systematic strategies to address the problem in a sustainable way. Teachers tended to rely on intuition and personal impressions rather than formal knowledge. When confronted with signs of MA in their classrooms, they often used short-term strategies, such as the seven ones described above, rather than addressing the deeper causes of students' anxiety.

Availability of school support and teacher's need for support

The third research question regarded the available school support and their needs or preferences for support to be able to address MA. Our findings showed that teachers consistently described a lack of structured school-level support. Our findings also point to the need for greater teachers' awareness and professional development so teachers can move beyond intuitive reactions toward more sustainable strategies for supporting students. Teachers in all countries expressed a desire to receive some form of support for addressing MA. The most preferred form of professional development involved practical examples and materials directly connecting with their context. This is a significant result, considering that research findings suggest that teachers are often one of the barriers to the implementation of MA interventions in practice. This points to the need for further research into the kind of teaching practices and tools that are effective for teachers to navigate through the wide spectrum of students' needs and experiences in order to recognize and alleviate MA effectively.

Moreover, our findings reveal systematic gaps in teachers' support for managing MA such as the absence of structured school support, lack of collaboration with specialized staff and parents and lack of facilitating structures (time, small classes, information about students). This can be a problem for teachers, as the broader teaching environment (such as the school system and workload) also influences how they can respond to MA.

Conclusion and implications

How schools across Europe can support teachers and students in alleviating MA remains an open question. Psychology offers many insights into MA, however these insights are not easily translated into practice. Teachers occupy a pivotal role in implementing many of these insights and in shaping students' experiences of mathematics. Teachers' personal beliefs and past experiences with mathematics affect how students experience mathematical learning and, consequently, their levels of MA (Polacco et al., 2023; Schaeffer et al., 2021). Teachers can alleviate MA in the classroom by providing emotional support (Davadas & Lay, 2017) and redesigning their instructional practices (Westphal et al., 2018). For this to occur, teachers need to receive targeted professional development and support. Responding to this need requires a deep understanding of teachers' actual views and ways of dealing with MA in practice. The present study investigated these issues from teachers' perspectives across five European countries, adding new knowledge about teachers' actual practices and support needs. We found it particularly

revealing that there were so many similarities across countries regarding the identification of MA, the strategies used by teachers, and the lack of support available to them. We also found teachers' reliance on intuitive support to be an especially significant finding. It highlights that, while teachers possess strong pedagogical instincts, they are frequently operating without the backing of formal training or evidence-based protocols. Further, the few cross-country differences observed in our study suggest that teaching cultures (and consequently teachers' instructional practices) may influence both the identification of MA and the strategies teachers use to alleviate it. These insights can be used by policymakers, educational organizations, and researchers in several ways. We suggest some possibilities next.

Implications for practice

Given that educational systems differ across countries, any solution to support teachers and students in alleviating MA must be adaptable to both national and local contexts (context-sensitive). Our findings show that teachers across countries are already attempting to respond to MA, but often without formal preparation, shared tools, or institutional support. This cross-national convergence strengthens the need for practical professional development and more systematic school-level approaches. Therefore, one important implication of this study concerns teacher professional development. We suggest that a comprehensive approach is needed, involving individual awareness, teacher-level practices, and school-level support. This support should be available through teacher education and professional development programs focused on MA and on school-level initiatives. Another implication of this study is related to the identification of systematic gaps - such as the lack of school-level support - that policymakers can address by developing measures for schools to adopt.

Further research

We have identified several areas related to MA that warrant further investigation. First, more research is needed on the role of teachers in managing MA in classroom practice, including collaboration with parents and specialized staff. Second, the cross-country differences observed in our study suggest that teaching cultures may influence both the identification of MA and the strategies teachers use to alleviate it. We hypothesize that countries that place greater emphasis on independent learning in the classroom may conceptualize MA differently from countries that do not. Similarly, teachers in countries where the use of prescribed school methods is strongly emphasized may rely less on creative pedagogical approaches than teachers in other contexts. Further research could examine these assumptions. Third, it would be valuable to investigate how teachers' beliefs about mathematics and their past experiences with the subject influence students' MA, as these factors shape teaching practices and, consequently, students' experiences of mathematics (Polacco et al., 2023; Schaefer et al., 2021). Fourth, additional research is needed on the development and implementation of teacher professional development programs aimed at addressing MA. Finally, while this exploratory study compared five European countries, future research could extend this work by investigating these questions more systematically and in other European contexts.

Limitations

Several limitations should be acknowledged. Our resulting findings should be interpreted as exploratory insights into teacher practices across multiple European contexts, rather than as representative cross-country comparisons. The relatively small sample size and purposive sampling approach limit the generalization of findings. A further limitation is the uneven distribution of teachers across grade levels in the different countries. For instance, participants in Finland and Portugal predominantly taught primary education, from 1st to 6th grade, whereas those in the Netherlands and Malta taught secondary education, from 7th to 9th grade. Consequently, some of the cross-national variations observed may be partially conflated with age-related developmental differences in how students express MA.

Additionally, the self-reported nature of the data may be subject to social desirability bias, as teachers may have presented their practices in more favourable terms. For instance, no teachers referred to triggers such as negative teacher feedback, teacher own anxiety, or rigid teaching practices, although these are some triggers of MA described in the literature. Also, the use of focus group interviews involves desirability bias because the social setting may increase participants' tendency to provide socially desirable responses and to refrain from reporting more negative or stereotypical views of students, as well as negative practices such as punishment, scolding, or shaming. These practices have been identified in the literature as triggers of MA (Evangelopoulou et al, 2023; Kinanda et al., 2024).

Another limitation concerns the possibility of self-selection bias. Participation in both the questionnaire and focus group interviews was voluntary, and teachers who were already interested in MA, more aware of students' emotional challenges, or more motivated to reflect on their classroom practices may have been more likely to participate. This may have contributed to the high level of reported noticing of MA and to the wide range of strategies described by teachers. In addition, the sample included a high proportion of experienced teachers, which may have shaped the perspectives reported in the study.

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Appendix 1: Teachers' Questionnaire

In this research, we see mathematics anxiety as an emotional reaction characterized by feelings of fear, tension, and apprehension when engaging with mathematical tasks or situations. It involves cognitive, emotional, physiological, and behavioral responses that can impair mathematical performance.

Questions	**Options**
Q1. At which grade levels do you teach mathematics? (You may select multiple options.)	1st grade, 2nd grade, etc.… up to 9th grade
Q2. How many years have you been teaching mathematics? (Choose one answer.)	Less than 5 years. 5–10 years. More than 10 years.
Q3. What subjects do you teach?	- Only mathematics and mathematics related subjects.

	- Multiple subjects, including mathematics.
Q4. Have you noticed mathematics anxiety in your students? (Choose one answer.)	Yes, often. Yes, sometimes Rarely I have not noticed it
Q5. What signs have you observed in students who experience mathematics anxiety? (You may select multiple options and you can also write your own thoughts in the "other" section.)	- They withdraw from tasks or avoid math. - They appear nervous or anxious during math lessons. - They have difficulty concentrating in math. - They express negative emotions about math. - Other
Q6. How do you think mathematics anxiety affects students' learning and participation? (You may select multiple options and you can also write your own thoughts in the "other" section.)	- They struggle to focus on tasks. - Their test performance is lower than their actual skill level. - They avoid participating in math lessons. - Other
Q7. What strategies do you use to reduce mathematics anxiety in your classroom? (You may select multiple options and you can also write your own thoughts in the "other" section.)	- I incorporate games and interactive learning methods. - I give students extra time to complete tasks. - I discuss students' feelings about math with them. - I have not consciously used specific strategies. - Other
Q8. Does your school have support systems or strategies in place to reduce mathematics anxiety? (Choose one answer.)	- Yes, the school has specific strategies and support available. - Partially, but more support is needed. - No, there is no specific school-wide approach.
Q9. What kind of support would you like as a teacher to manage mathematics anxiety? (You may select multiple options and you can also write your own thoughts in the "other" section.)	- More training and materials. - Practical examples and tools for teaching. - Collaboration with school psychologists or special education teachers. - I do not feel I need additional support. - Other
Q10. What kind of support do you think your students need, related to mathematics anxiety? (Open)	
Q11*. What kind of games do you use to support your teaching? (You can also answer "I don't use.") (Open)	
Q12*. How could a digital learning game help reduce mathematics anxiety? (Open-ended question)	

***** *Results from Q11 and Q12 were not taken in this study*

Appendix 2 categories and examples at country level

Category	Malta	Croatia	Portugal	the Netherlands	Finland
Symptoms of anxiety	Panic, freezing, sweating, shutdown, physical signs (e.g. fidgeting, fits), avoiding eye contact, reluctance to answer, Giving up/withdrawal *"the moment they see the question, they panic"*	Fear, anxiety and blockage; Physical symptoms; Giving up/withdrawal; Negative emotions during exams *"I see physical symptoms: stomach-aches, headaches, even feigning sickness."*	Verbal refusal ("I can't," "I don't know"), cognitive blocking/freezing, crying, anger/frustration, physical signs (fidgeting), avoidance/rushing to finish, withdrawal/giving up. *[student who would]"draw until he tore the paper",*	student withdraws/ shuts down; often asks for confirmation; negative self-image; frequent mistakes; negative emotions during tests (cry) symptoms are hard to separate from traits or social fear *"especially that they withdraw, avoid the math"*	students' speech; physical reactions (tapping with a pencil); resistance, avoidance, and emotional discomfort; harder to identify in older students *"I can't do math, and do I have to, and I don't want to."* Terminology: "math anxiety" too strong for younger students; alternatives: rejection, nervousness, uncertainty.
Sources of anxiety	Teachers' attitude, early negative experiences, learned helplessness, gender stereotypes, social comparison, inherited "all of them referred further back to when they had these teachers who somehow made them feel bad for making a mistake in class"	"We have parents convinced their children understand everything at home, but homework proves otherwise."	Societal perception of math as "difficult", early negative experiences leading to knowledge gaps, and lack of foundational concepts. [teachers acknowledged a pervasive societal view that] "maths is difficult", which students internalize.	starts in primary school, past failures, parents are afraid of math, math is difficult, fear of peers: "they're told at home that it's a very important subject. That also creates some extra pressure"	Social comparison and shame (e.g. some students avoid joining small groups or sitting at the front because they fear being labelled); Social comparison with fast-working peers, especially during tests. "In an exam situation, you easily get stuck thinking, "
Evolution over time				Math anxiety as a state "Some students can transcend it. But it may also be that it will arise more with some students just during his school …."	MA evolves over time Negative feelings don't appear immediately but build up as topics become more difficult

Category	Malta	Croatia	Portugal	Nederland	Finland
Triggers of anxiety	Assessment tasks, surprise activities, unfamiliarity, word problems, parental pressure, lack of support "If I use the word 'task,' or 'test,' or 'we're going to do an activity,'... that's when you see those kids who are more anxious become tense"	Internal insecurity; parental pressure; lack of basic concepts; social values "We always notice increased anxiety among all pupils during tests."	Unfamiliarity with new concepts parental pressure, binary nature of answers (right/wrong), formal paper-based tasks versus games. [one teacher noted that a student] "was capable in games, and then on paper, no, he wasn't able".	Shows up differently across activities, parental pressure; test anxiety. "During the tests that students are just so insecure that they just get a blackout faster"	Topic difficulty matters; Assessment; Test settings; family attitudes such as "no one in our family is good at math" "I got a six, so I'm not even going to do anything anymore"
Impact on learning	Reduced participation, memory impairment, lower achievement, loss of confidence, self-labelling as "bad at maths". "When there's anxiety, it affects the working capacity of their memory. So that impacts performance from that angle too"	Decreased motivation, withdrawal from tasks, low self-efficacy, social withdrawal and isolation. "One pupil was completely blocked."	Reduced participation and disengagement, development of real knowledge deficits over time, lowered self-esteem, and motivation. "Won't be capable" [before even trying]	Reduced participation, withdrawal; negative self-image, lower performance in test settings "That whole exam was just very easy and she made a lot of mistakes there"	Passivity, slow progress; lower students' self-esteem and motivation; "Another reaction I sometimes notice is that they start chatting with the person next to them, disturbing others."
Multiple strategies	Prompting, scaffolding, reassuring language, peer work, step-by-step questioning, low stakes testing "At first, I keep giving the same questions until they're confident, then change them bit by bit" Drill work, meaningful contexts, cross-subject integration, concrete-pictorial-abstract, project-based tasks "Putting significance in everything we do – whether concrete, pictorial, then moving to abstract… so at least they can see it's not beyond them".	Small groups work, encouragement, continuous explanation individualized approach; oral examination; "in stressful situations teachers switch to "oral questioning, without emphasizing that it counts as grading" Collaboration with parents, professional staff. "When a parent understands our approach and realizes where the child is making mistakes, then Emotional security, Sense of belonging, "I encourage them not to fear mistakes, to dare come to the board, to try, talk,	Positive reinforcement, using visual aids (drawings), explaining concepts in multiple ways, encouraging/light-hearted language, peer collaboration for new ideas. "I do a lot of drawings for them to understand" Playful/game-based learning, project-based tasks, demonstrating real-world applicability, individualized student approaches. [make learning more playful and less intimidating by using]"ludic approach"	Positive feedback, start simple, positive experiences, discuss easy assignments, avoid placing students at a lower level, repetition, retest option, "positive feedback. That really works very well." Individual explanation, learning path options supported by the textbook(...) in the school method the students can choose their own learning route" (…) Sometimes you need more repetition and then you don't make that most difficult task" mistakes are allowed; acknowledging feelings	Encouragement, creating experiences of success, "The longer you can keep them feeling that they are capable, skilled, and talented, the longer it will last. Their self-esteem will gradually improve. Small group work, pace, slowing down the pace, clear lesson structures, task differentiation, homework at school "here (at school) we decided that the child could stay after school to do their homework, so that they wouldn't have to go home" Small classroom design "After completing one or two tasks, you can go to

		even fail. It's important they support each other." "I send the child for a walk or to drink water."		"I also say in class: just make mistakes, because you're still learning."	the hallway to do the exercise circuit."
Systemic gaps	Lack of school policies, limited awareness, few structured interventions, dependency on individual teachers "We don't really [have practices]. Everyone must fend for themselves"."	Lack of formal education/training, absence of written protocols, changes/turnover in professional staff "informally, in passing, in the staffroom"	Lack of formal school policies or practices, dependency on individual teacher intuition and initiative, reliance on informal peer support rather than structured interventions. [professionals like psychologists are reserved for]"something very excessive"	school tutoring; no specific support; no teachers' support; no collaboration with special teachers "I haven't learned strategies or anything either. We never took a course or anything."	Support is often informal and situational. School psychologists and counselors are available but focus more on general well-being than math-specific anxiety; large classes "group sizes should be small, because even though there are all kinds of math tools available, they don't help much
Support needs	Time, smaller classes, LSE collaboration, professional development, cross-subject links, resources for differentiation "If we had six lessons instead of five, and the sixth lesson would be a tutorial… where you actually help the kids".	Professional staff, individualized approach, change of value system	Access to diverse resources and materials for differentiation, collaboration with colleagues for pedagogical strategies, professional development (psychologist) only in extreme cases.	knowledge about math anxiety; evidence based; practical knowledge; student info; smaller classes; time "I would need practical examples that have also been proven effective."	collegial sharing, smaller class sizes, more time; collaboration with special education teachers and school psychologists; "And there would also be support from a [special education teacher] could take one group, for example, or work with the teacher, providing support and additional assistance"

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