Research Study[1]

What perceptions do individuals, involved in mathematics teaching and learning, hold of the use of mathematics specialist teachers in Grades 6-8?

Kathleen T. Nolan, Ph.D.

Associate Professor, Faculty of Education, University of Regina, SK, Canada

General Information

This research study, taking place in the province of Saskatchewan (Canada), was conducted with five different stakeholder groups: 1) elementary (K-8) school administrators, 2) Grade 6-8 teachers, 3) Grade 6-8 students, 4) their parents, and 5) university pre-service middle years teachers. Since these five groups of individuals are connected with mathematics education at the middle years/intermediate level, they each offer important perspectives on the benefits (perceived and/or observed) of educating mathematics specialist teachers for Saskatchewan elementary schools, specifically at the Grade 6-8 level. The research study was funded by a *Social Sciences and Humanities Research Council of Canada* (SSHRC) Insight Grant and was approved on ethical grounds by the University of Regina Research Ethics Board (REB). In addition, each of the four Saskatchewan school divisions involved in the study granted approval for schools within the division to participate in the research study.

Report on

Grade 6-8 CLASSROOM TEACHER QUESTIONNAIRES

The key aim of this part of the research study is to understand school teachers' experiences of, and perceptions on, the role of mathematics specialist teachers in grades 6-8 classrooms. This report represents a summary of responses to select questions from completed teacher questionnaires returned by mail to the researcher (Dr. Kathleen Nolan). In total, approximately 59 questionnaires were distributed to Grade 6-8 classroom teachers in 15 schools across 4 Saskatchewan school divisions. Teachers were asked to complete the questionnaire and return it by mail in the postage paid envelope provided. **Twelve (12) teacher questionnaires were returned** (approximately a 20% response rate).

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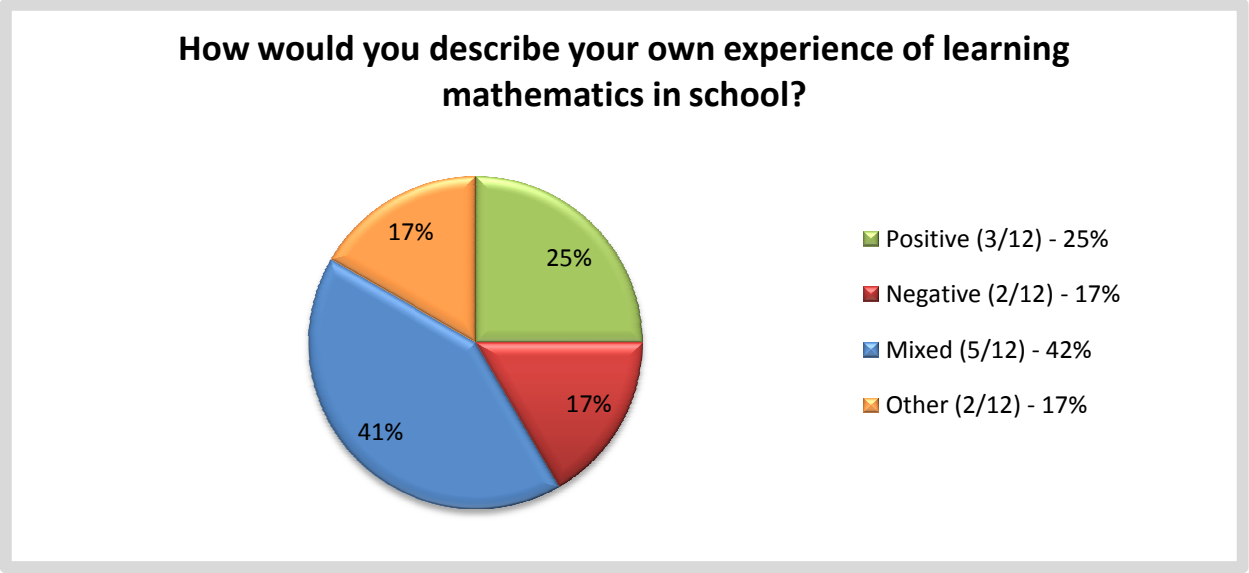
PART A: Current Attitudes and Practices

1. Overall, would you describe your own experience of learning mathematics in school as positive, negative, or somewhat mixed? Please explain.



The 'Other' category reflects responses that do not appear to answer the question about the teacher's own experience of learning mathematics in school.

Experience	Questionnaire Responses
Positive (3/12) – 25%	**Positive—math came easy to me. However, now as a math teacher myself I wish I would have been taught differently as a student—I only was good at the steps & memorizing.** **Very positive! I was fortunate to have teachers that were both knowledgeable and passionate about math. They in turn fueled my love of math!** **Positive. I enjoyed math. I like problem solving. I liked the order & logic of math.**
Negative (2/12) – 17%	**Negative, drill/practice without any explanation of why were learning what we did. Simply copy out how to do this and do 30 questions.** **Negative. The teacher gravitated towards helping students who understood vs. those that did not.**
Mixed (5/12) – 42%	**Somewhat mixed. I was good enough at math that I didn't always need to apply myself therefore I sometimes missed crucial instruction and had a hard time catching up.**

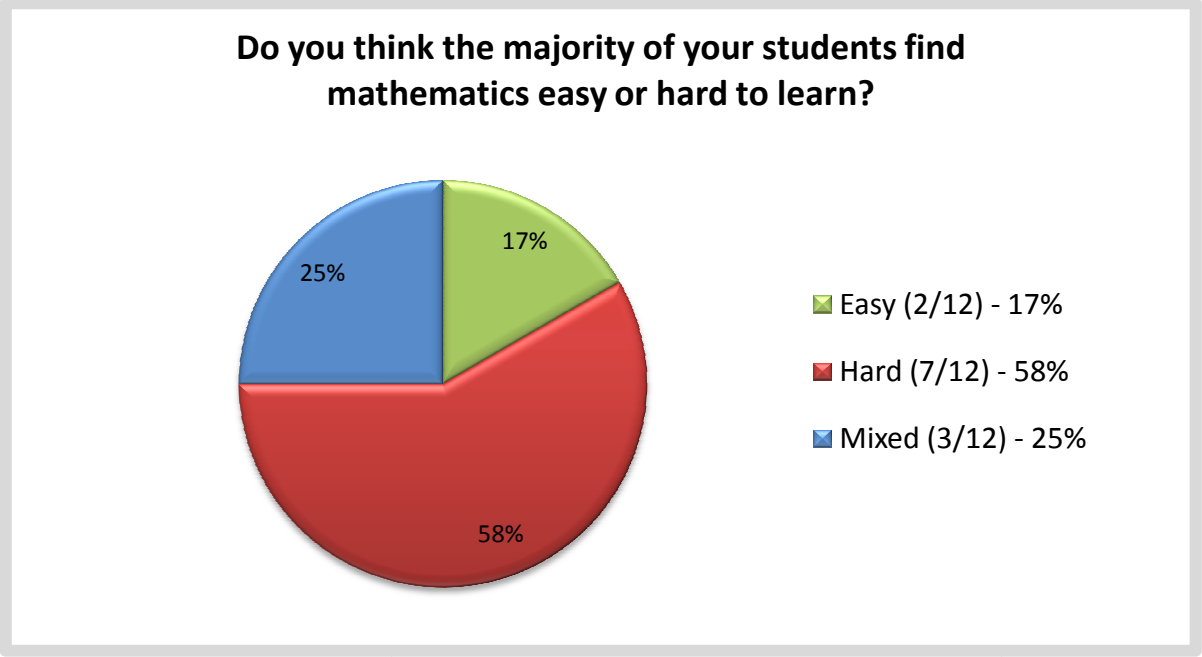
Experience	Questionnaire Responses
Mixed (5/12) – 42% continued	**Mixed, in elementary school it was fun and I seemed more engaged. In high school I can remember being much more disinterested.** **My learning experience was very mixed. It depended on the teacher and how they portrayed the information. If one example was given followed by many drill and practice questions, it was very difficult. Those who took time to really explain made life easier.** **Somewhat mixed. I had positive experiences with concepts I quickly understood and negative with concepts I had difficulty with. I often times struggled with concepts I did not immediately understand and would give up rather than try to figure it out.** **Somewhat mixed. I had teachers who did not have time for kids who were not superstars.**
Other (2/12) – 17%	**I love teaching math but this year was forced to teach math simultaneously to 2 grades. Very difficult.** **Positive, I enjoy teaching math and I teach it in many different ways so students can understand. Somewhat mixed, when students lack basic skills (mult/division) so I am reteaching basic skills.**

2. Do you find mathematics easier or harder to teach than other subjects? Why?

Question 2 has not been analysed at this time.

3. Do you think the majority of your students find mathematics easy to learn or hard to learn? Why?

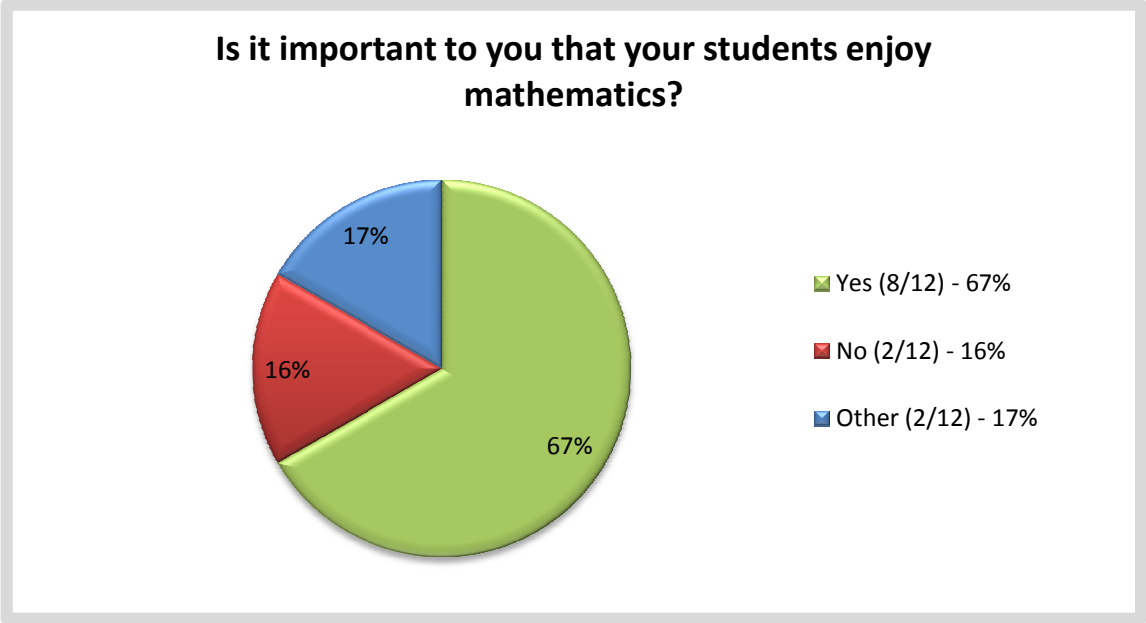
See results next page.



Mathematics Learning	Questionnaire Responses
Easy (2/12) – 17%	Easy to learn. I try to make it fun. Those who find it difficult tend to be apathetic. Easy. They are receiving A & B in this subject area.
Hard (7/12) – 58%	Many find the vocabulary extensive, especially English as second language. At the higher levels the students seem to struggle more. I think that it is due to needing to learn so many different rules. The majority find it hard. I believe the difficulty for most students is they have a preconceived notion math is boring or too hard. Hard—pre-conceived ideas that math is complicated & hard to do. Hard. Different levels so hard to find a balance. I would have to say hard because doing math means having to think, and so many students do not want to think, they want to be given the answers. Skills are definitely getting much, much weaker. No one has basic skills of times tables. Work ethic very low.

Mathematics Learning	Questionnaire Responses
Mixed (3/12) – 25%	**Hard to say—I think it is a good mix. Some kids math just comes easier to where some kids don't understand the abstract concepts in mathematics. Complete mix. Some come into the class with a much higher level of competency and some are far below. [sic]** **Mixed—those with solid # facts tend to be more successful, those with gaps or limited # facts struggle.**

4. Is it important to you that your students enjoy mathematics?



Enjoy Mathematics	Questionnaire Responses
Yes (8/12) – 67%	**Yes, it is a necessary skill.** **Yes, as these are life skills.** **Yes! I find if they enjoy math they apply math and are more willing to use math and take risks.** **I don't think I have reached the level of making it enjoyable everyday. I'm working on it as I do believe it is important.**

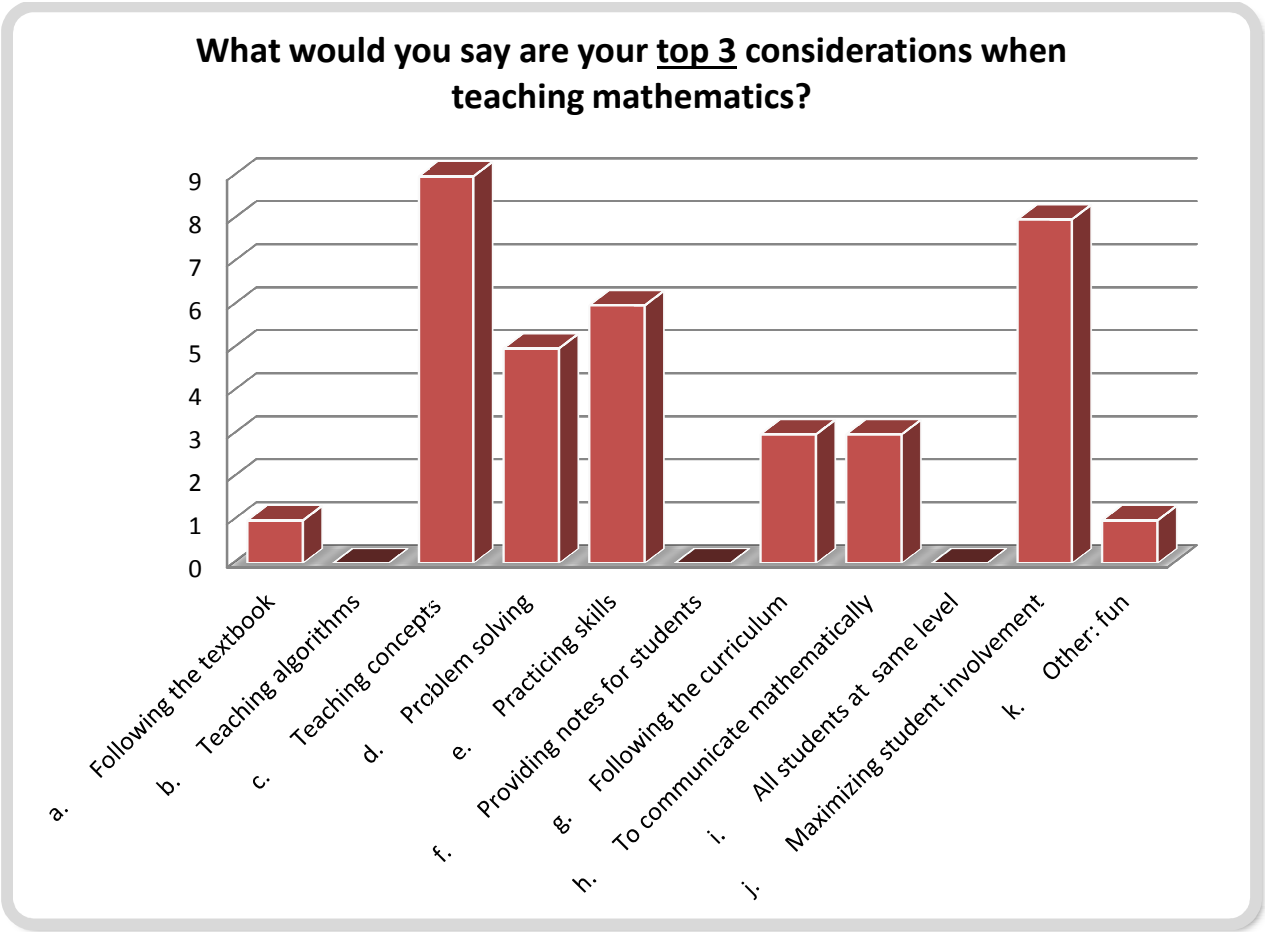
Enjoy Mathematics	Questionnaire Responses
Yes (8/12) – 67% continued	**Yes.** **Very! The more they enjoy it, the easier they'll find it.** **Yes** **Yes. When we enjoy the activities we learn more and retain more.**
No (2/12) – 16%	**No.** **Enjoy?... No. See it as necessary... Yes.**
Other (2/12) – 17%	**Students learn better if they enjoy something but I know that not everyone enjoys the same things.** **Somewhat.**

5. Of the following areas of focus, what would you say are your top 3 considerations when teaching mathematics? [Circle the letters]

    a. Following the textbook
    b. Teaching algorithms
    c. Teaching concepts
    d. Problem solving
    e. Practicing skills
    f. Providing notes for students
    g. Following the curriculum
    h. Being able to communicate mathematically
    i. Having all students at the same level
    j. Maximizing student involvement
    k. Other (please specify): _____

There were 36 responses in total (3 each survey). It is interesting to note that the most common combination of 3 areas of focus selected was: **c**. teaching concepts, **e**. practicing skills and **j**. maximizing student involvement. This combination was selected by 4 of the 12 respondents.

See graph of results next page.



6. How important is it to you to "stay with" your plan for a lesson?
    a. Not at all
    b. Somewhat
    c. Very

Question 6 has not been analysed at this time.

7. How would you handle a situation in which it becomes clear that you cannot proceed with your planned lesson, but instead need to adapt it to accommodate struggling or advanced learners?

Question 7 has not been analysed at this time.

8. How often do you assign mathematics homework?

    a. Never

    b. Sometimes

    c. Most school days

Question 8 has not been analysed at this time.

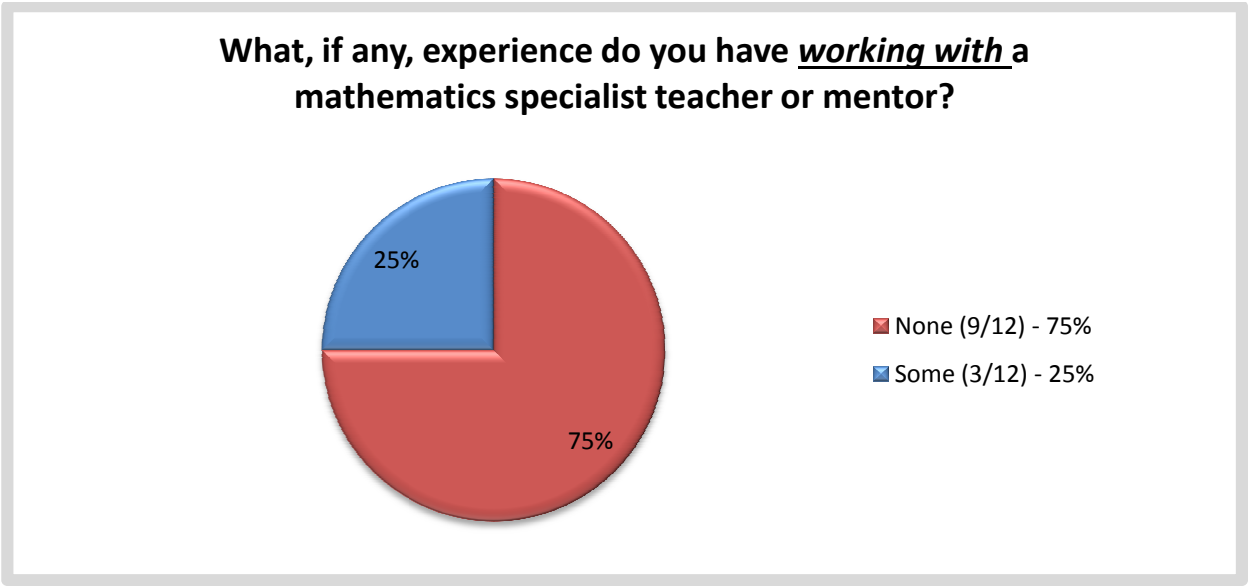
9. What is your main goal when assigning mathematics homework?

Question 9 has not been analysed at this time.

PART B: Mathematics Teaching Specialists

A mathematics specialist teacher is one who acts as a catalyst for promoting and supporting good attitudes and good pedagogical practices in mathematics classrooms in schools and in school divisions. Mathematics specialists may act as mentors or coaches to their colleagues, or they may take on the exclusive role of mathematics teacher in many classrooms, while other teachers take on the responsibility for teaching other subjects.

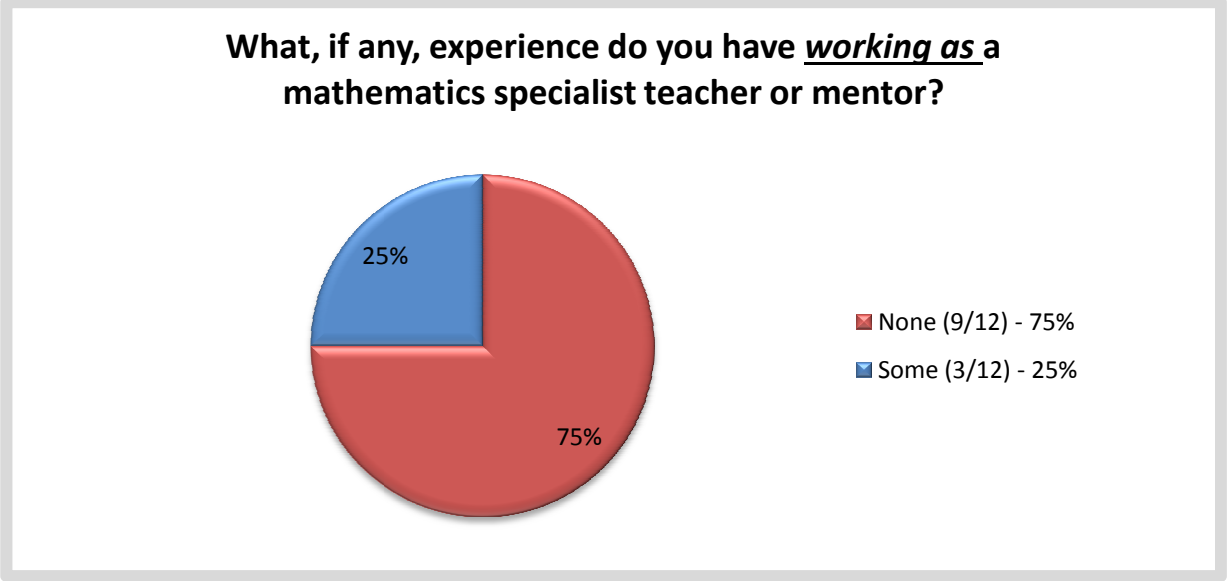
1. What, if any, experience do you have *working with* a mathematics specialist teacher or mentor?



All 12 respondents indicated no experience *working with* a mathematics specialist teacher. However, 3/12 respondents considered that their school division's mathematics consultant serves in the role of mathematics mentor and thus indicated some experience working with this consultant in their classroom.

3/12 respondents indicated some experience *working with* a mathematics consultant, but not with a mathematics specialist teacher. Qualifying supplementary responses were:
I have worked with our division Math consultant in my classroom and during a math PLC (5 division teachers are part of a math PLC that the ministry puts on.
Limited experience with our system consultant
Consultant

2. What, if any, experience do you have *working as* a mathematics specialist teacher or mentor?



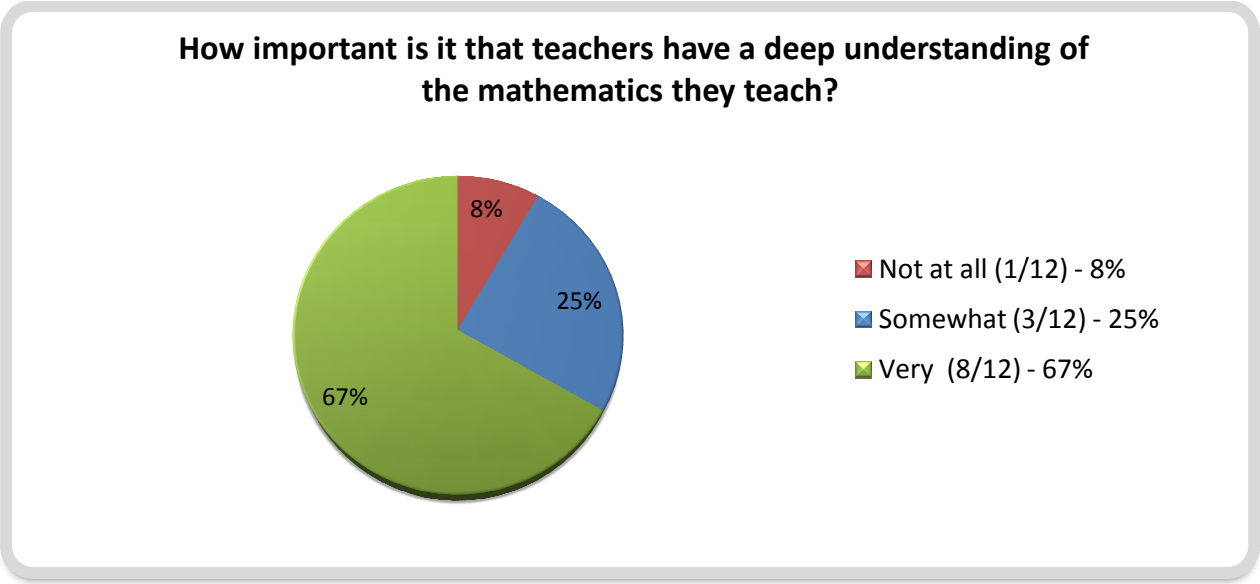
3/12 respondents indicated some experience *working as* a mathematics specialist teacher. Qualifying supplementary responses were:
Some experience as I have taught our Grade 7 and Grade 8 math classes.
I was also in charge of our school-based math PLC and book club. I also was in charge of doing math intervention from gr. 1-8.
Limited—now PLC type situations

3. How important is it that teachers have a deep understanding of the mathematics they teach?

    a. Not at all

    b. Somewhat

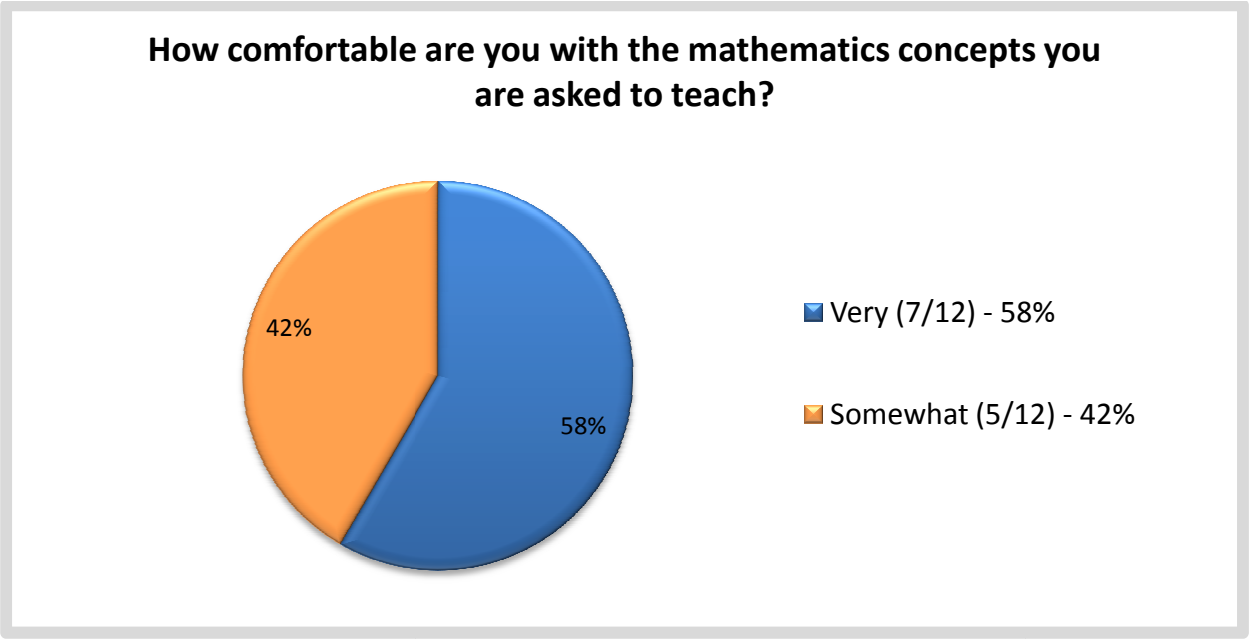
    c. Very



It is worth noting that two respondents qualified their selection to this question with supplementary comments.

Qualifying supplementary responses:	
'somewhat'	**You need to be confident and know it without an answer key.**
'not at all'	**I believe the best math teachers are people who struggle with math and have experiential understanding of the challenges students face.**

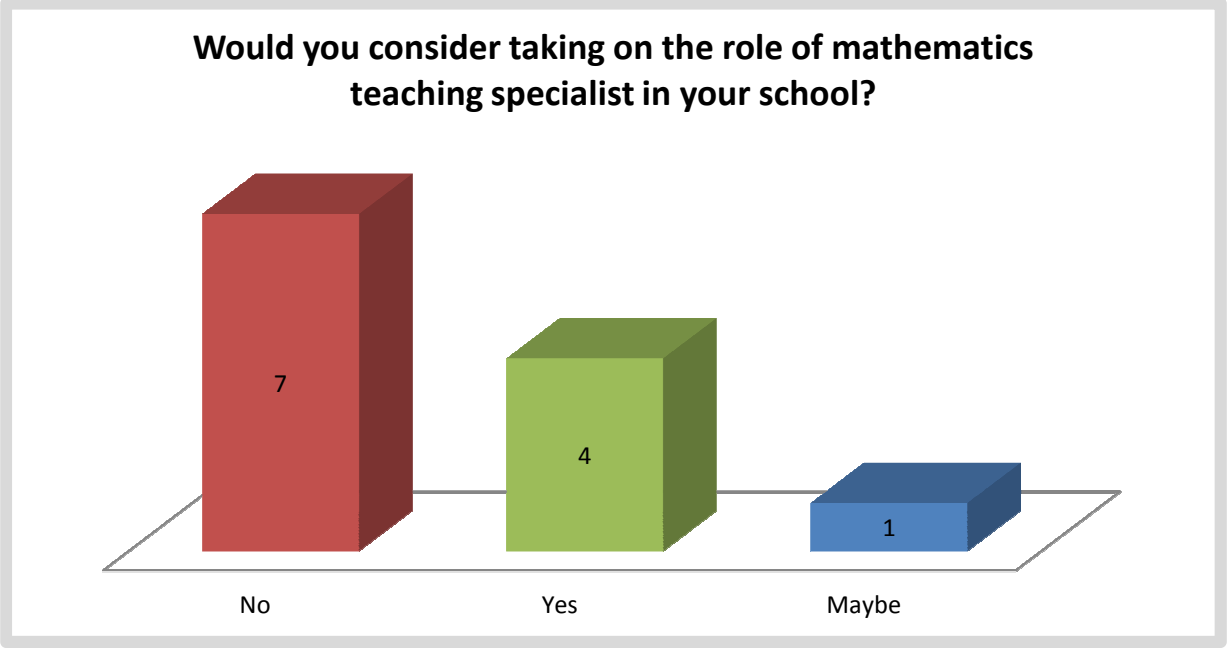
4. How comfortable are you with the mathematics concepts you are asked to teach?



Note: 7/12 teachers replied that they were “very” or “very comfortable” with the mathematics concepts they are asked to teach.

5/12 respondents indicated they were somewhat comfortable with the mathematics concepts they are asked to teach. Qualifying supplementary responses were:
Somewhat comfortable—large portion of my preparation goes to math.
It depends on the level.
It varies from strand to strand. I am confident in my ability to teach in all of the strands, but less comfortable in some than others.
Fairly—but I also review and practice if unsure
Somewhat

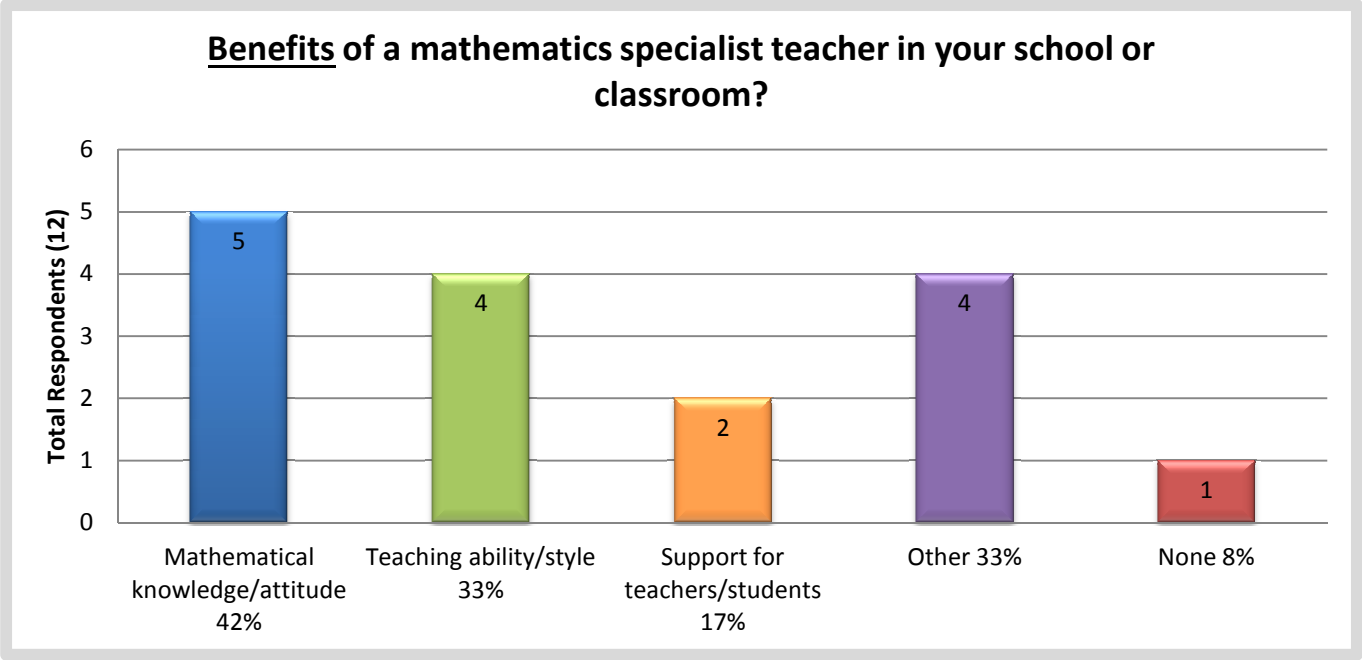
5. Would you consider taking on the role of mathematics teaching specialist in your school? Why or why not?



Response Types	Questionnaire Responses
No (7/12) – 58%	**No. It is a heavy subject to teach & to correct tests.** **No. Not my interest.** **No, I am not strong enough in all math areas to be a specialist.** **No- too much time out of class—students are more successful with fewer teacher changes—more changes = greater range of expectations which is difficult sometimes.** **No. I enjoy it, but it is not my passion.** **I am retiring so no!!** **No**
Yes (4/12) – 33%	**Yes, because I enjoy teaching Math as it can be a creative outlet that still has measurable outcomes.**

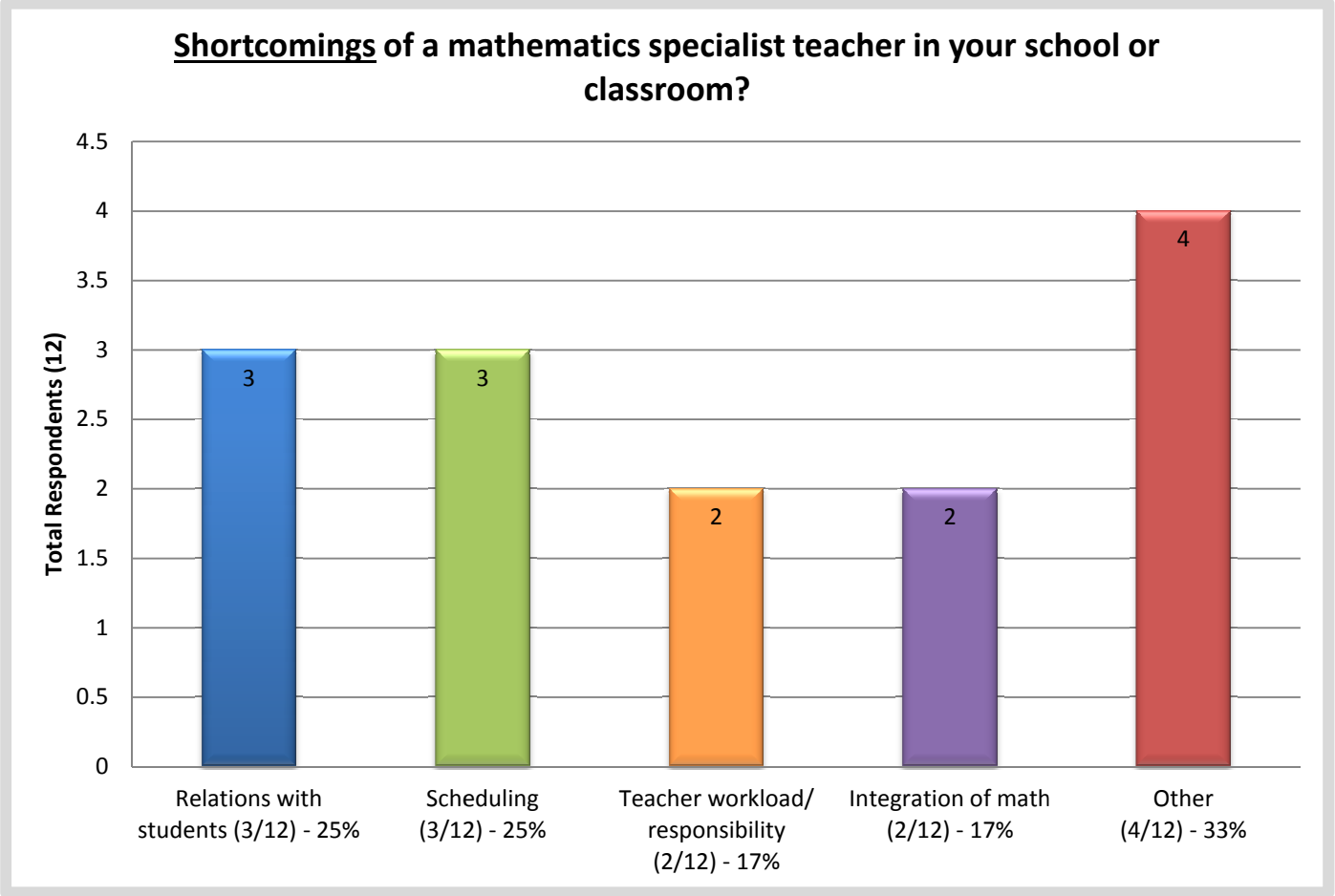
Response Types	Questionnaire Responses
Yes (4/12) – 33% continued	Yes, I'm passionate about math Absolutely! My dream job! Yes
Maybe (1/12) – 8%	Possibly. I enjoy teaching math; however it is difficult to form a bond with students when you are a specialist

6. What would you consider to be the benefits of a mathematics specialist teacher in your school? Or in your classroom?



Benefits	Questionnaire Responses
Mathematical knowledge/attitude (5/12) - 42%	Knowing subject matter. A person with specific knowledge and understanding in an area More knowledge/skill It would provide the students with a teacher that has a passion for math Teacher knowing what exactly was taught the previous years
Teaching ability/style (4/12) – 33%	Ability and experience to recognize difficulties and adapt to individual needs. Students can get used to a teacher's teaching style Consistency from unit to unit, concept to concept, year to year A desire to make math easier for students to understand.
Support for teachers/students (2/12) – 17%	It would allow for improved collaboration and support for teachers. provides additional support and expertise.
Other (4/12) – 33%	More to offer students. For sure. Having a math mentor would have been fabulous. Not sure Several benefits. Especially for students.
None (1/12) – 8%	No.

7. What would you consider to be the shortcomings of a mathematics specialist teacher in your school? Or in your classroom?



Shortcomings	Questionnaire Responses
Relations with students (3/12) – 25%	**I know the students very well & a math specialist wouldn't.** **Developing a deep relationship with students** **I believe students have more learning success with a consistent presence in the classroom. Dividing their day into specialists adds additional routines, etc. that can take away from student learning. I also believe, as I wrote in #3, a person who struggles with math understands the students' difficulties in a more productive way.**

Shortcomings	Questionnaire Responses
Scheduling (3/12) – 25%	Scheduling Presents some difficulties with scheduling. No shortcomings other than scheduling issues.
Teacher workload/responsibility (2/12) – 17%	They may also be good at teaching other subjects The teacher may get bored A lot of responsibility on one person A lot of work for one person (prep, correcting, etc) At this school it would add extra workload to a teacher when there is no funding available to have a teacher lower the rest of their teaching load to take on the responsibility
Integration of math (2/12) – 17%	Its good to work Math "Language" and practices into other subject areas Integrating math & other subjects
Other (4/12) – 33%	? Never had one. Not sure. None No reply - (blank)

8. Do you have any additional thoughts or comments to offer on the topic of mathematics teaching and mathematics teaching specialists?

5/12 respondents had additional thoughts or comments to offer on the topic of mathematics teaching and mathematics teaching specialists:
I think if you take on this subject area, it is something you should be confident with & enjoy. I have a repoire [sic] with the students & can communicate well.

5/12 respondents had additional thoughts or comments to offer on the topic of mathematics teaching and mathematics teaching specialists:
There is “too much” in the Math Curriculum if parental support or self motivation is missing. This puts Math teachers in a position of having to make “choices” when it comes to Curriculum Concepts.
I would have all teachers teach in their specialist area starting at grade 5 if they could.
Teaching split class math slow learners has been a huge challenge for me. Two grades with multiple learning levels very big challenge.
Better teacher training for all. Current math program has moved too far away from some basic required skills students need.