

INTERSECTION POINTS

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The Research Council on Mathematics Learning seeks to stimulate, generate, coordinate, and disseminate research efforts designed to understand and/or influence factors that affect mathematics learning.

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Contents:

- 1. President's Column
- 2. Connection Points
- 3. Letter from the Editor
- 4. RCML Officers

Presidents Column



Daniel Brahier RCML President

It was 28 years ago that I first read the groundbreaking book *On the Shoulders of Giants: New Approaches to Numeracy*, edited by Lynn Steen. That book got me thinking about how everything we do in our careers is little more than a continuation of work that someone else did ahead of us. The longer I am in this profession (now in my 38th year of teaching), the more I realize that there are very few "new" ideas under the sun – just recycled, refined, and re-named terms that were invented by the great minds that preceded us. It was their forward thinking "ahead of their time" that enabled us to do our work today.

In RCML, we have a rich tradition of standing on those "shoulders" of mathematics educators who set the tone for the rest of us. One of them is Dr. William (Bill) Speer – a founding member of RCML and my own mathematics methods instructor from college days. At this year's annual conference of the National Council of Teachers of Mathematics, Bill was given a Lifetime Achievement Award for the incredible contributions he has made to the profession for more than four decades.

Bill has been a professor, dean, mentor, author, consultant, officer, and inspiration, in addition to being a loving husband and father. His name is synonymous with RCML, and he is still the "go to" person we all contact whenever we have questions about the history or focus of the organization. Along with others, from Jim Heddens to Bob Ashlock, John Wilson, and Tom Romberg, the founding members had the vision to build a community of educators who would look critically at research data and join forces to improve mathematics education for all students.

Beginning with conferences at Kent State in Ohio back in 1974, 1975, and 1976, the founding members set the tone for the rest of us, and as we rapidly approach 50 years of being a professional organization, we are all indebted to people like Bill Speer for inspiring us to conduct our research, to publish our work, and to meet annually to make presentations that share our experiences with peers. In his acceptance speech in Washington, Bill noted that we only stand on the shoulders of giants because someone helped us up on their backs – that we can't do it alone and depend on our teachers and mentors. He added that "even on our worst day" we may be the "best hope" of some of our students. His speech inspired several thousand who were in attendance that night and, once more, showed us how deserving his is of this prestigious honor.

I am proud to extend the legacy by serving as President of RCML but, more importantly, I am excited to congratulate Bill on his lifetime service to NCTM and to the profession. As we go about our daily work, I am reminded of a slogan of another hero of mine who encouraged people around him to "be more" – not to work harder, to accomplish more, or to earn more income, but simply to "be" more. It is my hope that, in the years to come, we will continue to look back at our history and appreciate the work that was done by our mentors – we truly do stand on the shoulders of those giants!

Connection Points



Samuel Otten, University of Missouri Sean Yee, University of South Carolina Megan Taylor, Trellis Education

What Do In-Service Teachers Recommend for Secondary Mathematics Teaching Methods Courses?

In a recent issue of RCML's *Investigations in Mathematics Learning*, we reported on a nationwide survey of teacher educators where we asked them what was vital for inclusion in secondary mathematics teaching methods courses (Yee, Otten, & Taylor, 2017). This study was rooted in the observations that (A) there is a great deal our field wishes we could include in methods courses (see, for example, the recent standards from the Association of Mathematics Teacher Educators, 2017), (B) we do not have enough time to cover everything we want nor to the depth that we desire, and (C) there is a lack of systematization in secondary mathematics methods courses nationwide. Our survey results largely confirmed (A) and (B) and there were some indirect indications of (C), which has also been found in past studies (e.g., Taylor & Ronau, 2006).

In reflecting on this research, however, we realized that we might have been drawing upon too limited a population. After all, instructors of methods courses are not the only ones who have insight or a stake in what should be included. Thus, in a follow-up survey, we turned to *in-service teachers* as an additional population whose collective voice should be considered with regard to what topics and experiences are most valuable for secondary mathematics teaching methods courses. We were also curious about the degree to which in-service teachers' responses would align with teacher educators'.

In total, 130 secondary mathematics teachers (mean experience level 11 years; median 7 years; 28 teachers completed post-baccalaureate certification and 6 were alternatively certified) from across the country responded to the survey. The main question was phrased as follows: "Please tell us how important you feel it is for each of the following content items to be valued and addressed by secondary mathematics methods courses for preservice teachers." There were 41 options provided with a five-point Likert scale from "Not Important" to "Very Important" (see Yee, Otten, & Taylor, 2017, for details) and also an open-ended opportunity for teachers to suggest other topics.

Survey Results: Similarities and Differences

The teacher educators and the in-service teachers were similar in that they both generally valued the methods topics that we included on the survey. The average rating for the teacher educators was 4.1 out of 5.0 (standard deviation = 0.44) and for the inservice teachers it was 4.0 (standard deviation = 0.43). To put it another way, the teacher educators overall only rated one topic at or below "Neutral" in terms of importance ("do educational research (e.g., Action Research)") and the in-service teachers only rated two topics at or below "Neutral" ("do educational research (e.g., Action Research)") and the in-service teachers only rated two topics at or below "Neutral" ("do educational research (e.g., Action Research)" and "history and nature of mathematics"). The two groups were also similar with regard to some of the topics rated as most important. In Table 1, for instance, you can see that they agreed on three of the five highest-rated topics.

Table 1

According to Teacher Educators	М	SD	According to In-Service Teachers		SD
Mathematical knowledge for teaching	4.68	0.58	Mathematical knowledge for teaching	4.62	0.57
Multiple representations of mathematical ideas	4.68	0.64	Multiple representations of mathematical ideas	4.52	0.65
Attending to student thinking and using student ideas to push understandings forward	4.68	0.57	Attending to student thinking and using student ideas to push understandings forward	4.44	0.69
Understanding of practice / process standards (e.g., CCSS, NCTM, NRC)	4.71	0.56	Motivating students to persevere and take risks	4.58	0.59
Adapting, choosing, and generating mathematical tasks	4.61	0.59	Positive classroom culture	4.47	0.60

Top five most-valued topics for secondary mathematics teaching methods courses

There were also some notable differences between the groups. In-service teachers rated "motivating students to persevere and take risks" and "positive classroom culture" in their top five (Table 1), whereas these were not as high, relatively speaking, for teacher educators. Conversely, teacher educators rated "understanding of practice/process standards" as the most important topic, but this was just slightly above-average in importance according to in-service teachers (M=4.29, SD=0.88). With regard to statistical significance (p=0.01), Table 2 shows the topics that were rated differently.

Table 2

	Teacher	In-Service	E Value	Sig.	
Торіс	Educators (M)	Teachers (M)	r-value		
classroom management that supports cultural and learning goals	3.77	4.39	33.64	0.000	
productive classroom discourse	4.59	4.24	16.19	0.000	
enacting mathematical tasks	4.55	4.25	10.94	0.001	
mathematical content knowledge	4.13	4.43	8.05	0.005	

Topics with statistically-significant differences in rated value

You are welcome to contact the authors for more detail about the survey results.

Discussion

One of the reasons we undertook this survey-based research was to see if there were some collectively-identified core topics for secondary mathematics teaching methods courses that might serve as a guide for instructors designing the courses. We did not, however, want to restrict respondent's answers to just the 5 or 10 most vital topics—instead, we were genuinely curious about everything they viewed as important for these methods courses. The result is that many topics seem to be important—too many, in fact, given the realities of time constraints and other demands on preservice teacher preparation programs. So how do we move forward?

Happily, there is some strong agreement from teacher educators and in-service teachers about the value of mathematical knowledge for teaching, multiple representations, and attending to student thinking. These broad topics are somewhat coherent in terms of building upon mathematical ideas and moving in the direction of teaching and learning and so could form a basis for a secondary methods curriculum. Beyond that, however, the question remains about whether to take the teacher educator suggestions, with an implied emphasis on ambitious teaching practices such as cognitively-demanding task enactments, discourse-rich instruction, and robust mathematical practices, or take the in-service teacher suggestions, with their down-to-earth focus on motivation, classroom management, and mathematical knowledge. Although a compromise of "all of the above" may seem appealing, it is not especially realistic given the time constraints previously mentioned. Thus, to navigate this dilemma of what to emphasize in secondary methods, we need additional conversations across programs and additional empirical evidence about what is the most beneficial for preservice teachers as they enter their first years of teaching. Some promising work has been undertaken by Jansen, Berk, and Meikle (2017) at the elementary level, following preservice teachers beyond graduation, but similar efforts are needed at the secondary level.

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Letter from the Editor



Bill McGalliard Intersection Points Editor

At our last annual meeting all the membership in attendance were asked to take a survey about which parts of Intersection Points they found both interesting and motivating. With this feedback in mind the the president, RCML board, and myself have decided to make some format and delivery changes starting with this issue to both modernize and streamline the information delivery process. In the past Intersection Points came out quarterly and was delivered as a word document for each of you to read through. Intersection Points will now come out on a monthly basis, with no issues for the months of June, July, and August, and instead of including a President's Column, Connection Points, Signal and Noise, Conference information and Highlights in each issue these components will be spread out over the course of the year in the monthly issues. We hope that this will make it both easier and more convenient for each of you to take in the information about RCML.

It is also my pleasure to announce our new Social Media Coordinator, Natalia Bailey. Natalia is an Assistant Professor of Mathematics Education at University of Central Missouri. She has been actively posting on Facebook and sending out informative Tweets via Twitter. If you are not following us on Social Media I encourage you to so by clicking on the links you will find at the end of this newsletter. Doing so will provide you excellent up to date information on our organization as well giving you some indications on where the field of mathematics education currently stands.

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