



Research to Practice Article***Development of the Mathematics Teachers' Beliefs about English Language Learners Survey (MTBELL): Research to Practice***

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Development and Validation of the Mathematics Teachers' Beliefs about English Language Learners Survey

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Overview

Current issues in secondary mathematics education involve a focused effort to improve instructional and cultural responsiveness in classrooms with diverse populations of students. One critical area deals with meeting the academic and language needs of the rapidly growing Latino(a) English Language Learner (ELL) population. Research shows that Latino(a) students encounter challenges such as educational achievement gaps and lack of access to differentiated pedagogical approaches (Contreras, 2011). Factors that contribute to these challenges include the beliefs, attitudes, and assumptions that teachers exhibit regarding the teaching and learning of ELL students. These considerations are important because they influence teachers' day-to-day choices that ultimately impact opportunities for ELLs. In essence, investigating questions that center on equitable practices for ELLs in secondary mathematics education is critically needed.

This paper discusses the ideas presented in Gann, Bonner, and Moseley's study, which employed a social learning lens to examine secondary mathematics educators' beliefs, attitudes, knowledge

base, and instructional approaches in relation to meeting the academic and language needs of a rapidly growing ELL student population. The goal of the study was twofold: 1) to develop and pilot an instrument, the Mathematics Teachers' Beliefs about English Language Learners (MTBELL) survey, that measures secondary mathematics teachers' beliefs, attitudes, knowledge base, and instructional practices relative to ELLs' academic and language needs; and 2) to implement a valid and reliable MTBELL survey among mainstream secondary mathematics teachers to further understand the relationships between the mentioned factors.

While other studies have examined the associations between teacher beliefs and instructional practices with diverse populations of learners, the investigators claim the following under-researched sectors: a) the secondary mathematics classroom setting; b) the population of mainstream secondary mathematics classroom teachers; and c) teacher beliefs in relation to the cultural context of an ELL population. Thus, the study not only sought to consider these educational gaps, but also added to the field by offering an applicable and valid tool to measure secondary teachers' mathematical

conceptions related to the teaching and learning of ELLs.

Development and Implementation of the MTBELL Survey

The authors' first goal was to create a reliable and valid survey through the process of piloting. A series of theoretical constructs were developed based on emerging research related to teaching ideologies. After revisions, the five final constructs were: a) Culturally Responsive Teaching (CRT) Beliefs and Practices; b) Subtractive Affects Against CRT; c) ELLs Learning Mathematics and Language; d) Challenges to ELLs Learning Mathematics and Language; and e) Teacher Support needed to integrate CRT practices. Survey questions within these constructs were formed by extracting items from other valid and existing surveys with the exception of two open-ended questions developed by the researchers. The MTBELL was piloted through a series of panels, and results from the pilot phase were used to revise the MTBELL survey and therefore establish the validity and reliability of the tool.

The second goal of the study was to utilize the MTBELL online survey in order to understand secondary mathematics teachers' conceptions in relation to ELLs' academic and language needs. Accordingly, the researchers surveyed 283 mainstream secondary mathematics teacher participants from a large school district in the Southwestern region of the United States (53% middle and 47% high school teachers). The district was reflective of the ethnic diversity of the state and offered dual language programs at two middle schools and ESL at all campuses.

Discussion of Findings

Two overarching themes emerged from the data analysis. These were teacher perceived beliefs towards *opportunities* and *barriers for culturally responsive teaching* and were utilized to explain teacher beliefs, attitudes, and knowledge base of working with ELL students. The central conclusion in the study suggests that "secondary math teachers were knowledgeable about culturally responsive beliefs and practices to meet the needs of ELL's, but

were hindered by perceived barriers over which they may or may not have control" (Gann, Bonner, and Moseley, in press). The barriers included issues of time and negative tensions, which teachers believed added to their existing challenges (e.g. more workload). Opportunities referenced positive assets such as teacher support in training and development when working with ELLs.

Thus, an important take-away from this study is that mainstream secondary mathematics teachers are constantly involved in a balancing act between their perceived beliefs, related to teaching and learning barriers and opportunities, of the ELL population. The researchers presented the MTBELL survey as a unique instrument that tapped into teacher conceptions, provided a space for self-reflection, and resulted in data applicable to the further development of professional learning opportunities for teachers working with the ELL population.

Implications for Practice

While the findings of this study brings a closer understanding of the socially constructed conceptions of this particular group of teachers, it is important to reflect on the researchers' claims and how they align to the implications of our own educational practices. Thus, how do we as educators come to understand our ELL student population and our instructional approaches in this realm? More importantly, how do we react in culturally responsive ways to increase our ELL students' access to educational opportunities in meaningful ways? In this sense, notions such as equity, access, and culturally responsive teaching need to be considered. The following section succinctly presents key ideas from the study that applies to our own mathematical conceptions regarding the teaching and learning of ELLs. In turn, they form points of discussion and self-reflection that help to beneficially influence our classroom practices.

One principal idea is that culture and language cannot be detached from teaching and learning (Gay, 2009). In this sense, a starting point is for teachers to reflect on their own beliefs and understandings of the cultures and languages of ELL

students. While the MTBELL survey provides this opportunity, it is what we do with the results that count. Thus, when our own constructed beliefs about *barriers* and *opportunities* arise, we must acknowledge that these beliefs impact our instructional approaches when working with diverse populations and find collaborative ways to apply culturally responsive practices in our classrooms. These decisions need to align to student, and not teacher, needs.

A second idea is that mathematics is socially constructed and some learners are “more privileged and others more marginalized and disadvantaged” (Gay, 2009, p. 198). This notion addresses a need for mainstream secondary mathematics teachers to place inclusiveness as a priority when making educational decisions. We as educators need to understand that injustices exist and therefore seek culturally responsive approaches to lessen the equitable access gap. Some important factors include seeing language as a tool for learning, establishing a classroom culture of respect, encouraging open communication, and changing the curriculum to meet all students’ needs. Accordingly, the MTBELL survey provides a way for teachers, schools, and districts to determine baselines for culturally responsive teaching that can assist in tailoring professional development experiences that enhance our culturally responsive knowledge and practice.

Finally, we must think about the research that claims that “many teacher still struggle with creating a workable balance between cultural diversity and cultural unity among the diverse learners in classrooms” (Gay, 2009, p. 201). We know that secondary mathematics teachers make choices everyday, but they must consider the opportunities and restraints that they place on the accessibility of educational opportunities for our diverse learners. Again, reflection, acknowledgment, and use of culturally responsive teaching practices are necessary to lessen educational gaps with diverse learners.

Tools such as the MTBELL provide ways in which secondary mathematics educators can reflect upon their socially constructed beliefs and

understandings regarding their ELL student population. Additionally, it creates opportunities to recognize how these ideas impact culturally responsive teaching and decision-making practices. Furthermore, educators such as district administrators and curriculum specialists can use measures like the MTBELL to provide professional growth opportunities to secondary mathematics teachers in this area.

Further Reading

Although there is still a dearth of research regarding secondary mathematics teachers’ beliefs and practices in relation to ELLs, there exist two recent research studies that indicate similar ideas with varying groups of teachers but from different perspectives. Song and Samimy’s (2015) work of “What contributes to the changes in teachers’ beliefs?” would be beneficial when coupling with this research to design future professional development for teachers of ELLs. Ottmar, Rimm-Kaufman, Larsen, and Berry (2015) offer an opportunity to extend their findings regarding a “responsive classroom” with third-grade teachers to culturally responsive classroom for ELLS with secondary mathematics teachers.

References

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