

Factors influencing middle school mathematics teachers’ Beliefs about ELLs in mainstream classrooms

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Abstract

The purpose of this study was to explore the factors influencing the beliefs middle school mathematics teachers have about English Language Learners (ELLs) in mainstream classrooms. One hundred forty-nine middle school mathematics teachers from 11 school systems in Georgia completed the “Middle School Mathematics Teachers’ Beliefs about English Language Learners Questionnaire.” Teachers who had received training felt significantly more prepared to teach ELLs and to help them understand class materials than did teachers who had not received training. In addition, females believed significantly more than males that teachers should modify assignments for ELLs. Teachers need more training in ELL pedagogy to successfully meet the needs of the ELLs they are likely to encounter.

Introduction

There are over five million English Language Learners (ELLs) in schools in the United States, and in the last ten years this population has grown 65% (National Clearinghouse for English Language Acquisition [NCELA], 2004). ELLs are estimated to be increasing at two and a half times the rate of the general student population (Marx, 2000; NCELA, 2006). According to the NCELA (2006), ELLs are students whose first language is not English and who are in the process of learning English. The National Council of Teachers of English (NCTE, 2006) reported that the diversity of these students “continues to challenge teachers and schools” (p. 1). With increasing numbers of ELLs in schools, student demographics are changing. Teachers need to be primed for this new challenge.

Purpose

The purpose of this study was to explore the factors influencing the beliefs middle school mathematics teachers have about the ELLs in their classrooms. The research reported here is based on one research question from a larger, mixed-method study involving the beliefs of middle school mathematics teachers, what strategies they use with ELLS, what support they need, and the experiences of the ELLs in their classrooms.

Review of the Related Literature

Youngs and Youngs (2001) found mainstream teachers who had lived outside the United States were significantly more positive about teaching ELLs. Similarly, Gandara, Rumberger, Maxwell-Jolly, and Callahan (2005) observed that teachers who had more ELLs in their classrooms felt more competent to teach these students and that the more years teachers worked with ELLs, the more highly they rated their ability to teach these

students. However, the results of Garcia-Nevarez, Stafford, and Arias (2005) showed “the more years a teacher taught, the more his or her attitude became negative toward his or her students’ native language” (p. 295). If teachers were fluent in another language, they were found to be more likely to implement practices that encouraged and affirmed students’ home language (Lee & Oxelson, 2006; Youngs & Youngs, 2001). Although age did not make a significant difference, Youngs and Youngs found females had more positive attitudes toward ELLs than males.

Teacher training seems to be the most notable predictor of beliefs concerning ELLs. Youngs and Youngs (2001) found that teachers who had some type of English to Speakers of Other Languages (ESOL) training were significantly more positive about teaching ELLs than those teachers who had not had these experiences. ESOL is defined as an educational approach in which English language learners are instructed in the use of the English language (NCELA). It is possible to be an ELL without being an ESOL student, but all ESOL students are ELLs. Gandara et al. (2005) also found “greater preparation for teaching English learners equaled greater teacher confidence in their skills for working with these students successfully” (p. 12). According to Lee and Oxelson (2006), the teachers with ESOL training “agreed with the idea that the maintenance and proficiency in the heritage language positively affect linguistic minority students’ academic endeavors” (Lee & Oxelson, p. 461). On the other hand, the teachers without ESOL training believed their foremost priority is to teach English.

Method

The “Mathematics Teachers’ Beliefs about English Language Learner Questionnaire” was distributed to 439 middle school mathematics teachers in 11 school systems in Georgia. The questionnaire results were analyzed using Statistical Package for the Social Sciences (SPSS). The response rate was 36 percent with 149 responses. Mathematics teachers were chosen to survey because ELLs generally achieve poorly in mathematics (Abedi & Lord, 2001; Herman & Abedi, 2004). “The myth that mathematics is ‘culture-free’ or a ‘shared language’ obscures the reality that learning mathematics in a second language requires linguistic, cultural, and content development” (English, 2007). Students need language skills, as well as cultural knowledge to perform well in mathematics.

Results

Crosstabs, correlations, and one-way ANOVAs were used to determine the factors influencing participants’ beliefs. In the ANOVA tables, the means are from Likert items in which strongly disagree was coded as “1”, disagree was coded as “2”, neither agree nor disagree was “3”, agree was “4”, and strongly agree was “5.”

Two factors made a significant difference on teachers’ beliefs. The most notable differences were between those who had received training in teaching ELLs and those who had not. Those who had training believed they were significantly more prepared to teach ELLs and felt they were good at helping ELLs understand the material in their classes significantly more than the teachers who had not received training. In addition, females believed significantly more than males that teachers should modify assignments for ELLs.

Analyses of variance indicated that teachers who had received training in teaching ELLs were significantly different from those who had not on four teacher belief variables (see Table 1). Specifically, teachers who had received training felt significantly more prepared to teach ELLs and to help them understand class materials than did teachers who had not received training. In addition, teachers who received training were significantly less likely to agree that if students can speak English fluently with their friends, they should be able to understand the mathematics content as well as others. Likewise, the teachers with training were significantly less likely to agree that students should be able to acquire English within 2 years of enrolling in U.S. schools.

Table 1
Means of Teacher Belief Variables against Training Received

Questionnaire Items Related to Teacher Beliefs	Training Received ^a	Training Not Received ^b	<i>p</i> value	Eta squared
I am well prepared to teach the ESOL students in my classes.	3.04	2.40	.001	.101
I am good at helping ESOL students understand the material in my classes.	3.69	3.20	.006	.076
If students can speak English fluently with their friends, they should be able to understand the mathematics content as well as other students.	2.56	3.02	.036	.043
ESOL students should be able to acquire English within two years of enrolling in U.S. schools.	2.75	3.20	.018	.055

Note. N ranged from 90 to 103.

^a*n* ranged from 45 to 48. ^b*n* ranged from 45 to 55.

Having received training is significantly related to three of the teacher belief variables (see Table 2). Specifically, having received adequate training to work with ELLs was significantly related to feeling good about being able to help ELLs understand the mathematics material, feeling well prepared to teach ELLs, and being able to adapt instruction to meet the needs of ELLs.

Table 2
Correlations with Likert Item: I Have Adequate Training to Work with ESOL Students

Questionnaire Items Related to Teacher Strategies	Pearson Correlation
I am good at helping ESOL students understand the material in my classes.	.47**
I am well prepared to teach the ESOL students in my classes.	.64**
I can adapt my instruction so that even those students with limited English proficiency can master the material in mathematics.	.33**
The ESOL students in my class hinder the learning of the other students in the class. (reverse coded)	.11
I welcome the inclusion of ESOL students in my class.	.15
I am not responsible for the mathematics achievement of ESOL students. (reverse coded)	.16
If students can speak English fluently with their friends, they should be able to understand the mathematics content as well as other students.	-.07
All things considered, I would rather not have ESOL students in my classes (reverse coded).	.07
It is my responsibility to bring ESOL students up to the same level as other students mathematically.	-.08

Note. N ranged from 87 to 90.

** $p < .01$.

Females were significantly more likely than males to agree that teachers should modify assignments for ELLs (see Table 3). However, gender was not significantly related to the frequency with which teachers reported that they actually did modify their assignments.

Table 3
Means of Teacher Belief Variables against Gender

Questionnaire Items Related to Teacher Beliefs	Male ^a	Female ^b	<i>p</i> value	Eta squared
Teachers should modify assignments for ESOL students in regular education classes.	3.41	3.85	.041	.044
I would rather not have ESOL students in my classes. (reverse coded)	3.67	3.87	> .05	
I welcome the inclusion of ESOL students in my class.	4.28	4.40	> .05	
The ESOL students in my class hinder the learning of the other students in the class. (reverse coded)	3.94	3.83	> .05	

Note. N ranged from 96 to 104.
^an ranged from 17 to 18. ^bn ranged from 79 to 86.

Crosstab analysis indicated that teaching experience is not related to the frequency with which teachers modify assignments for ELLs. Additionally, one-way ANOVA indicated that the number of years a teacher had completed as a school teacher did not make a significant difference on any of the Likert items on teacher beliefs.

Having lived in a non-English speaking country was not significantly related to the frequency with which teachers modified assignments. Additionally, teachers who had lived in a non-English speaking country were not significantly different from the teachers who had not on any of the teacher belief variables.

Teachers who speak another language did not differ significantly from teachers who do not speak another language on any of the teacher belief variables or the frequency with which they modified their assignments. This contradicts previous research that found teachers to have more positive attitudes about ELLs when they were proficient in another language (Lee & Oxelson, 2006; Youngs & Youngs, 2001).

Additionally, the number of times a teacher had traveled to a non-English speaking country was not significantly related to any of the teacher belief variables.

The percentage of ELLs that teachers taught was calculated by dividing the total number of ELLs taught by the total number of students taught. The percentage of ELLs in a teacher's classroom was not significantly related to any of the teacher belief variables (all $ps > .05$).

Discussion

Many teachers are graduating from their certification programs without the training they need in second language acquisition required to be successful in teaching ELLs. Pettit (2011) posits there is a "poverty of language learning" in U.S. teacher education that needs to be rectified by teaching the five "beliefs for the successful inclusion of ELLs: (1) high expectations for ELLs, (2) accepting responsibility for ELLs, (3) encouraging native language use both at home and in the classroom, (4) an awareness of the time it takes ELLs to learn academic English, and (5) a desire for professional development in relation to ELLs when needed" (in press). Through this study, middle school mathematics teachers, in particular, were found to need training in ESOL pedagogy.

Having training was found to be effective in influencing teachers' beliefs in a positive way toward ELLs. Future research should be conducted to uncover additional factors influencing teachers' beliefs. Only two factors (i.e., training received and gender) were identified through this study. It is important to know why teachers believe they way they do before attempting to change their beliefs.

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