

4-1-2013

Teachers' and Students' Beliefs about ELLs in Mainstream Mathematics Classrooms

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Recommended Citation

Pettit, Stacie K. (2013) "Teachers' and Students' Beliefs about ELLs in Mainstream Mathematics Classrooms," *Journal of Contemporary Research in Education*: Vol. 1 : No. 3 , Article 5.
Available at: <https://egrove.olemiss.edu/jcre/vol1/iss3/5>

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Abstract

The purpose of this study was to explore the beliefs middle school mathematics teachers have about ELLs, to identify the strategies used to help ELLs, to explore the support teachers need to teach ELLs, and understand some of the experiences of ELLs in mainstream mathematics classrooms. In addition to student and teacher interviews, 106 middle school mathematics teachers from 11 school systems completed a questionnaire. The qualitative portion of the data is presented here.

“When I first came here, I feel nervous and scared because I didn’t understand any English.”

–Trong, 8th grader from Vietnam

By the year 2030, approximately 40% of the school population in the United States will speak English as a second language (U.S. Department of Education, 2003). In order for English Language Learners (ELLs) to become academically successful, teachers must hold positive beliefs and high expectations for them. The beliefs and attitudes of teachers, perhaps as much as qualifications, can affect what children learn in their classroom. Teacher beliefs and attitudes, which are formed by the values they hold, play an important role in student performance (Freeman & Freeman, 1994; Moore, 1999). Thompson (1992) emphasizes that “to understand teaching from teachers’ perspectives we have to understand the beliefs with which they define their work” (p. 129).

Not only do teachers’ beliefs affect the expectations they hold of students, but their actions in the classroom also reflect their beliefs. The study of beliefs is a crucial element in teacher education because beliefs “drive classroom actions and influence the teacher change process” (Richardson, 1996, p. 102). Therefore, it is necessary to learn about the beliefs of teachers before trying to change their practices. According to Peregoy and Boyle (1997), if teachers have unexamined negative

beliefs toward ELLs, even well meaning teachers might discriminate without realizing it.

Purpose

The purpose of this study was to explore the beliefs middle school mathematics teachers have about the ELLs in their classrooms, to identify the strategies these mathematics teachers use to help the ELLs in their classrooms, and to explore the support teachers need to teach the ELLs in their classrooms. Finally, I hoped to learn how ELLs feel in their mainstream mathematics classrooms.

Review of the Related Literature

“I like barely came to school. We went to school in the class and she told me to go to the board and when I still haven’t read the question, so I just had to guess.”

–Alicia, 6th grader from Mexico

Similar to Ladson Billings’s (2004) discussion of the problem of “the poverty of culture” in teacher education, Pettit (2011) believes there is a “poverty of language learning” in U. S. teacher education. She claims that many teachers who have completed their degrees have an overwhelming lack of knowledge of second language acquisition

(SLA), multicultural education, and English to Speakers of Other Languages (ESOL) pedagogy. Research has shown that teachers' beliefs influence their classroom behavior (Pajares, 1992; Rueda & Garcia, 1996). According to Harklau (2000), the actions of teachers of ELLs "not only serve to teach language but also serve to shape students' attitudes toward schooling and their very sense of self" (p. 64).

Research has shown that many mainstream teachers believe ESOL students are primarily the responsibility of the ESOL teacher (Harklau, 2000). This is both impractical and incorrect. As Yoon (2008) states, "Teaching ELLs is not a responsibility of only ESL teachers but also of classroom teachers" (p. 516). Pettit (2011) identified a set of beliefs for successful inclusion of ELLs that include (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.

Method

"When I was new, I was, like, nervous, not talking to people because you don't know no one and sad because the teacher asks something and you don't know but some people tell you but you still don't know if they tell you exactly what she says."

--Alicia, 6th grader from Mexico

Both qualitative and quantitative data were gathered for the study. Specifically, data came from three sources: a web-based teacher questionnaire, student interviews, and teacher interviews. Middle school mathematics teachers of ELLs completed the "Mathematics Teachers' Beliefs about English Language Learners Questionnaire." The questionnaire was distributed to 439 teachers in 11 school systems. Due to space limitations, only the qualitative data is discussed here.

Mathematics Teachers' Beliefs about English Language Learners Questionnaire

The qualitative portion of the questionnaire includes five open-ended items to give respondents an opportunity to either add more detail or say something that was not brought up through the other types of items. The open-ended items are (1) What are some of the challenges you face with the ESOL students in your classes?, (2) What do you like about teaching ESOL students in your mathematics classes?, (3) Please describe any strategies you use to help ESOL students in your classes., (4) In what ways do you feel the ESOL students in your classroom do or do not have an equal opportunity to learn the material in your mathematics class?, and (5) Please write any additional comments you have about this questionnaire or about the inclusion of ESOL students in mainstream classrooms.

Student Interviews

I interviewed four ELLs to provide student perspectives on being in mainstream classrooms. The interviews lasted approximately one half to 1 hour each. The interviews were conducted in the schools of the students. I tape recorded and later transcribed the interviews.

Table 1

ELL Interviewee Demographics

Student	Language	Grade	Gender
Alicia	Spanish	6 th	Female
Carlos	Spanish	6 th	Male
Diego	Spanish	8 th	Male
Trong	Vietnamese	8 th	Male

Note. All names are pseudonyms.

Teacher Interviews

In order to provide a more in-depth description of the teachers’ beliefs than could be attained just through the questionnaire, I interviewed five teachers. Table 2 provides demographic information on the 5 teachers I interviewed. They were all female.

The interviews took place in the schools where the teachers worked and lasted approximately 1 to 2 hours each. A Teacher Interview Protocol served as a guide for the interviews; the guide was semi-structured and was driven by questions that emerged from the questionnaire data. I tape recorded and transcribed the interviews.

Table 2

Teacher Interviewee Demographics

Teacher	Grade Level	% ELL in County	ELL Program Type
Ana	6th	0.4%	Pull-out
Colleen	6 th	10.4%	Inclusion/co-taught with ESOL teacher
Diane	7th	3.8%	International Center for recent immigrants
Hannah	8th	10.4%	Inclusion/co-taught with ESOL teacher
Linda	8th	0.4%	Pull-out

Note. All names are pseudonyms.

Analyses

I used a mixed research design of survey research followed by qualitative interviews. Qualitative analysis of coding and categorization of interview data provided a deeper understanding of middle school mathematics teachers’ beliefs about ELLs as well as information about the experiences of ELLs in mathematics classrooms.

Results

“Math is hard because I don’t understand so much English, and that makes it hard.”

--Diego, 8th grader from Mexico

I analyzed the five open-ended questionnaire items and the interview data qualitatively. Initially, I used Strauss and Corbin’s (1990) open coding system to write down any of my thoughts as I read the interview transcripts and open-ended responses. From there, codes were applied that resulted in categories, then themes (see Table 3). I used a combination of content and thematic analysis (Ezzy, 2002) because at times the categories were predetermined, yet other categories emerged from the data. Results of the analyses for each research question follow.

Table 3

Examples of Categories and Themes in Qualitative Analyses

Category Examples	Predetermined?	Research Question
Advantages	Yes	1
Challenges	Yes	1
Placement in mainstream classroom	Yes	1
Native language	Yes	1
Teachers’ beliefs about assessment with ELLs	Yes	1
Teaching experience, lived in a non-English speaking country, training received, gender, languages spoken, travel experience, ELL percentages	Yes	2

Modifications: differentiation, collaborative learning	Yes	3
Strategies: ESOL teacher, games, bilingual resources	No	3
Professional development	Yes	4
ESOL teacher collaboration	Yes	4
Students' opinions about assessment in mathematics	No	5
Students' experiences with teacher strategies used	Yes	5
Students' opinions about materials in mathematics: tests, textbooks, worksheets	No	5

Theme Examples	Research Question
ELLs motivation to learn	1
Lack of time	1
Reading in math	1
Vocabulary in math	1
Language learning in math	1
Responsibility for ELLs	1
Parental and home support	1
Bilingual textbooks and resources	3
Lack of collaboration	3
Mathematics/ESOL teacher tension	4
Words in mathematics	5
Writing in mathematics	5
Inconsistency in assessment	5
Bilingual resources desired	5

Note. No themes were predetermined, but were created based on participant responses to open-ended items and comments during interviews.

Research Question 1

What are the beliefs of middle school mathematics teachers about ELLs in mainstream classrooms?

Teachers' beliefs about the advantages of teaching ELLs. On the open-ended questionnaire items, teachers made many positive comments about ELLs. For example, 8 teachers mentioned ELLs being hard working or trying very hard; 7 teachers felt that ELLs were eager to learn or had a desire to learn. The most frequent comment, made by 10 teachers, was that they liked the diversity ELLs bring. For example, some teachers said they enjoyed learning about different cultures, backgrounds, and viewpoints from the ELLs in their classes.

One teacher I interviewed said that it helps broaden the thinking of the native English speaking students to have ELLs in their classes. This teacher also said the having more ELLs in class will “make you become more patient.” Similarly, another teacher I interviewed said that the native English speakers benefited from seeing someone who did not speak English struggle through that process. When asked about the effects of ELLs on the other students in the class, another teacher I interviewed said, “I am a firm believer that difference helps everybody.”

Teachers' beliefs about the challenges of teaching ELLs. In one open-ended item, teachers reported the challenges they face; Table 4 summarizes the most frequent responses. In response to an open-ended item, one teacher said, “There just isn't adequate time to assess their needs in a classroom with other students who speak English.” Related comments included, “I often do not have the time to teach all of the skills needed for their grade level” and “There is not enough time to cater to all students.” A common concern seems to be meeting the needs of the English-speaking students in a class with ELLs. For example, an open-ended item response read, “I understand

what I am supposed to do for my students. But when I have an ESOL class, no ESOL co-teacher, and little training, I simply cannot sit down and modify 28 different lessons. It's not feasible." Similarly, a teacher reported during an interview, "When I didn't have an ESOL teacher in the classroom, I just struggled, and it was all by myself. The native speaking English students were put on hold." Additionally, two out of the five teachers I interviewed said that the native-English speakers suffered academically by having ELLs in their classrooms.

Table 4

Challenges Faced by Teachers of ELLs in Mainstream Mathematics Classes

Challenge	Frequency
Language Barrier	9
Time (for planning, in the classroom)	6
Communication with parents	4
Communication with students	3
Word problems/vocabulary	2
"Some students are making no effort to become proficient in English"	1
"Students can and do exhibit racism"	1
Kids speaking their native languages	1
Impossible to "catch them up" in a classroom of 28	1
Lack of parent involvement	1

Teachers' beliefs about placement of ELLs in mainstream classrooms. A teacher responded to an open-ended item, "Students need to have at least some English proficiency to be placed in a regular math class." Another open-ended response read, "I think ESOL kids need basic language skills prior to going into any mainstream classroom ... for their benefit and mine and the other kids."

Similarly, one teacher I interviewed said, "I think all students, especially if they

come to us non-English speaking, need a beginning class, or to go to a school that's just for first year, beginning students, so they can at least have some acclimation when I say put your name on your paper, you understand what to do." According to another teacher I interviewed, ELLs are not even able to learn mathematics when they first arrive: "Can they learn the content? Not when they're first here, I mean, they've got so many other things to learn, just the behavior, the standard procedures, this school may be very different from where they came from. They may not have went to school, formal school, and so there are so many factors."

On the other hand, two comments were made in the open-ended section of the questionnaire indicating teachers' support for inclusion of ELLs in mainstream classrooms. One comment read, "I think inclusion is the best way if the teacher is equipped with the tools that will help these students." Similarly, a questionnaire respondent stated, "The inclusion of ESOL allows students to experience a diverse atmosphere which is relative to the global society."

Teachers' beliefs about reading in mathematics. Reading skills are important for success in mathematics (Grimm, 2008). According to Muth (1993), reading, particularly in word problems, plays an important role in mathematics learning. Although not addressed through any of the quantitative data, the open-ended questionnaire data and interviews indicated that regarding the success of ELLs in their classrooms, word problems and the amount of reading in the mathematics curriculum concern teachers. On an open-ended response, one teacher wrote, "So much now is reliant on reading. It's not just numbers in mathematics, and with the new standards it's even more so. When they have to read, they can't solve the problem." Other open-ended responses were "verbal expressions and word problems are very hard for them" and "when problem-solving, they don't have an equal opportunity to master the content because of the reading that's required." During an interview, one teacher gave a specific example about a difficult word problem. She said, "From the CRCT Coach books, probability

problems, if they are sitting there trying to figure out about the marbles in the bag, and then you do this, and you put the marble back after a draw, that falls back to English.” Another teacher I interviewed commented, “Reading is an issue.”

Many participants on the open-ended items and during interviews reported specifically about the emphasis on word problems in the Georgia Performance Standards (GPS). For example, open-ended item responses read, “It has been more difficult since GPS” and “ESOL students often have difficulty with the heavily-worded mathematics problems of Georgia’s new curriculum.” Similarly, a teacher I interviewed said, “There’s an awful lot more vocab in mathematics than people realize, with GPS especially!”

Teachers’ beliefs about vocabulary in mathematics. The topic of vocabulary in mathematics was not explicitly addressed in the quantitative sections of the questionnaire. However, the open-ended items and interview data indicated that teachers believed that even if ELLs can read the word problems and directions, the vocabulary of mathematics can be difficult for them. For example, teachers wrote on open-ended item responses that “the vocab is hard to understand,” “language is an issue with terminology,” “vocabulary plays such a big part in math,” and “when teaching math, there is a lot of vocabulary.” During interviews, other teachers gave specific examples of terms that have proven to be difficult for ELLs. For example, one teacher commented that the term “reciprocal” was confusing until she told them to flip the fraction. Another teacher I interviewed said that when she was teaching probability, one direction read “draw a tile out of a bag.” This teacher pointed out that to an ELL, “draw” means to create a picture. Similarly, another teacher I interviewed gave the following example:

We had a cylinder of beans, and we’re talking about the volume, and if we scooped out a cup, how much was left, ESOL students don’t understand “scooped out.” Some of the phrases that

are being used in our assessment still need some work because our ESOL students don’t know what some of those little short phrases were.

Teachers’ beliefs about the language barrier in mathematics. Trying to communicate with ELLs is challenging for many teachers. According to one teacher’s response to an open-ended item, “Language learning gets in the way of math learning.” Another participant responded to an open-ended item by commenting, “While numbers are a universal language, mathematics is not. It requires a great deal of language if taught correctly.” Others voiced their frustrations on the questionnaire in the following ways:

- How can I possibly teach complicated concepts to someone who speaks no English?
- If you cannot speak or understand the language, then how can you understand the directions or examples?
- ESOL students will always miss out on the classroom discussions because they cannot access the language.

Similarly, during an interview, one teacher commented that language is an issue and then later stated, “Language is a barrier in the mathematics classroom, a huge barrier.” Additionally, another teacher I interviewed said, “I just get frustrated if I can’t hold a conversation with them. It’s just so frustrating, but I’m sure it’s frustrating for them.” Moreover, a teacher confessed during an interview, “If they don’t understand me, and I can’t understand them, I don’t know how to teach them.”

Teachers’ beliefs about students’ use of their native language. For example, during an interview, one teacher told me she thought it was good for the other students to hear different languages spoken. Other teachers interviewed mentioned that using a native language is appropriate sometimes, but they still had their reservations. For example, one teacher I interviewed made the following comment:

I don’t want them using it as a crutch, but if we can use it to do the English and

their native language and parallel and start drawing some similarities to help bridge the gap, I don't see a problem with it.

Similarly, a different teacher said during an interview:

I think that your culture should always stay with you, and you should not be deprived just because you are going in another setting. Now I'm not saying use it all the time. But your culture is your culture, and that's something that's God given, and therefore you should be proud of it. But as far as trying to communicate with people when they're NOT of that language, then no.

On the other hand, other teachers indicated opposition to students' use of their native language in the classroom. For example, a teacher responded to the open-ended item asking "What are some of the challenges you face with the ELLs in your classes?" with, "The kids speaking their native language when talking with other students." Additionally, another teacher responded to this open-ended item by stating, "The challenge comes in when they begin to speak in Spanish and you aren't sure if they are staying on task." Similarly, one teacher I interviewed expressed her disapproval in this way:

In every class they love to speak Spanish, and I'll say ENGLISH, ENGLISH, ENGLISH. If you've had three years of English, speak it! Speak the language of English, not Spanish! If I've been taught Spanish for two years, my third year, I would be expected to be able to speak Spanish. WE need to start expecting that of our Spanish students speaking English.

Nevertheless, one student interviewed said, "When I don't know something, I talk to my friends in Spanish and they explain."

Teachers' beliefs about their responsibility for ELLs. For example, one teacher I interviewed said, "If there is just no

attempt made, then it's not my responsibility. You just can't be all to everybody all the time." Moreover, two out of the five teachers interviewed made references to "our kids" when referring to native English speakers. The open-ended questionnaire data provided no additional information concerning this belief.

Teachers' beliefs about assessing ELLs. Respondents to the open-ended items and the teachers I interviewed reported strong feelings on the topic of assessing ELLs. For example, an open-ended comment read, "Our performance standards don't take ESOL students into consideration. Similarly, one participant indicated an administrator was not holding ELLs to a high standard. The open-ended response read, "Some of the ones I have know that they will pass and do nothing in my classes. We are told to just give them a 70. That is not fair."

One teacher I interviewed said, "Most of our assessments are performance based now, and it's the language that always bogs down the ESOL students. How can we use the EXACT same assessment and expect the SAME thing from our non-English speakers?" Another teacher I interviewed also felt ELLs should be assessed differently than other students:

If they can't do basic computation, then they should fail, but if you are struggling with the language, but you can just put the mathematics down, show me this, I don't see where failing a student would be a benefit.

Similarly, another teacher I interviewed said, "If it's a language barrier, I don't believe you should grade them, but if it's a skill barrier, you need to grade them."

The results of the five interviews suggest that teachers' concerns about assessing ELLs go beyond the classroom to include standardized tests as well. For example, one teacher I interviewed said, "If they don't give them the CRCT in Spanish, it's just totally unfair. They don't even stand a good chance." Another teacher described her opposition to giving a recent immigrant a test in English. She said during an interview, "He was exempt from

CRCT, but I'm pretty sure he took the mathematics, and I'm like I don't understand. I just don't think it's fair. You aren't really able to assess their abilities."

Teachers' beliefs about parents of ELLs. Although I did not ask specifically about parents speaking English, a few teachers commented that not speaking English at home was an indication of a lack of support for school. One teacher stated during an interview that "when the parents aren't trying to speak English, it's almost like the parents aren't supportive of what you are trying to do at school." Similarly, another teacher I interviewed said:

We're just really bending over backwards when this is the country they've decided to move to. What don't you speak more English? Why are you speaking Spanish all the time and teaching your children *only* [italics added] Spanish, it's not helping them, and it's not helping the parents either. We'd like to see parents care as much as the teachers do in every way.

Teachers' beliefs about ELLs' home support. The idea that ELLs do not have the support they need from home was frequently mentioned as a challenge to teachers. For example, an open-ended response read, "Going home and not having very much support is a huge issue! It's not so much parents don't care, rather they *cannot* [italics added] really help them with most assignments!" Similarly, a teacher reported in an interview that "the parent support is just not there, so unless they get it in the classroom, don't expect them to get it at home." And according to another teacher I interviewed, "The support at home makes all the difference in the success you see in the classroom." Another interview participant divulged, "I don't think they are real strict about making them go to school down there. You can quit school when you are like 9 or something."

One teacher placed the responsibility of success at school back on the ELL. For example, an open-ended item response read, "Some use the language barrier as an excuse not to do

anything! Some have already shut down or just don't care. They may not have the support at home, but are not trying to get out of the rut."

Having lived in a non-English speaking country. When analyzing the open-ended questionnaire items, I found that the teachers who had lived in another country included the use of a native language as a strategy to help meet the needs of ELLs far more often than those who had not lived in another country.

Travel experience. The qualitative analysis of the open-ended responses on the questionnaire indicated that 24% ($n = 4$) of the teachers who had traveled to a non-English speaking country listed use of a native language as a strategy, while only 19% ($n = 7$) of teachers who had not listed it as a strategy. For example, one teacher who had traveled to a non-English speaking country reported, "I do translate some of the math vocabulary into Spanish (or their native language)." On the other hand, one teacher who had never traveled to a non-English speaking country reported on an open-ended item that he or she makes ELLs say the mathematics rules in English to help them remember them.

The qualitative data indicated that some teachers believed having more ELLs together in a classroom would make meeting their needs more manageable. For example, one teacher I interviewed commented, "It would be incredibly difficult if we had like a handful of ESOL kids. How are you going to have a student interpret for you? I would prefer to have one class with a significant amount rather than having them spread out over four classes." Similarly, another teacher I interviewed mentioned that she thought it is easier to teach ELLs when there are more of them. In analyzing the open-ended responses from the questionnaire, I found that the teachers with more ELLs were more likely to list group work as a strategy to help the ELLs in their classes understand the mathematics material than teachers who had fewer ELLs in their classrooms. Many of the teachers who had over 30% ELLs in their classrooms reported in the open-ended items that they need more help to meet the needs of these students.

Research Question 3

What strategies, if any, do teachers use to help ELLs succeed?

The questionnaire and the teacher and student interviews provided data to answer this question. I looked at the open-ended item “Please describe any strategies you use to help ESOL students in your classes.” I also asked the students during their interviews what types of things teachers do to help them learn math better.

On the open-ended items and in the interviews, many teachers expressed the idea that modifications were not necessary. For example, one teacher admitted that he or she was not meeting the needs of ELLs. The open-ended comment read, “ESOL students do not have an equal opportunity to learn the material in my mathematics class because I normally teach as though they do not have an Individualized Education Plan.” Additionally, one teacher I interviewed said, “They’re no different from the other kids.” Similarly, during an interview, another teacher said, “Once I’m teaching the mathematics, I don’t see it [being an ELL] as a benefit or disadvantage. They are another student in the class.” Another teacher made the following comment during an interview, suggesting that she was against modifications in her mainstream classroom:

I don’t modify assignments. When we get them, they go first to the international center, and then they come here and there is an ESOL person that works with them, and they are taken out. That’s a class like any other class, so when they come into *my* [italics added] classroom, there’s nothing there for modification.

However, on the open-ended questionnaire items, teachers reported using a variety of strategies other than modification to meet the needs of the ELLs in their classrooms. The most frequently named strategy was to provide ELLs with a peer tutor or peer buddy. Table 5 shows the frequency with which the strategies were listed. In addition to the

strategies listed in the Table 5, the following strategies were listed once: multicultural activities, repeat instructions slowly, play games, have students play teacher and work at the board, and have students keep vocabulary dictionaries.

Table 5

Strategies Teachers Used to Help ELLs

Strategy	Frequency
Peer Buddy	25
Adjusted/modified assignments	14
Small group	13
Visual representations/pictures	10
Individualized Instruction	6
Hands-on activities/manipulatives	5
Assignments in Spanish	5
Collaboration with ESOL teacher	3
Technology	3
Pointing and gesturing	3
Use of their native language	3
Extended time	2
Differentiation	2
Read work for them	2
Spanish glossary	2
After school or morning tutoring	2

The student interviews also provided qualitative data about the strategies teachers use to help ELLs. When asked, “What would help you understand math better?,” students provided a variety of suggestions (see Table 6).

Even though students mentioned bilingual resources as an effective strategy to help them understand mathematics better (see Table 6), sometimes translating material

into students’ native language is not adequate. For example, I asked the Vietnamese student to tell me about a time he couldn’t understand something in math. He responded, “Last year we had to use all the words of geometry and present. I don’t even know it in

Table 6

Quotes From Students in Response to the Question “What Would Help You Understand Math Better?”

Strategies	Quotes	
Collaborative Learning	Working with partners. Helps more when American.	
	I think working with friends.	
	Group work.	
Providing Examples	Give more examples. I would like more examples. Could give more example.	
	Games	With games. It’s better playing games in math. I had fun when playing a game.
	Bilingual Resources	Spanish book and English book so you can see Spanish and English. More Spanish things.

Individual Help	Come and help me individual.
Ask ESOL Teacher	When I don’t know something, I ask my ESOL teacher, and she tells to me things.

Vietnamese because in sixth grades I don’t know those things, so if you translate, I still don’t know.”

In summary, teachers believed it is important to use different strategies and modifications to help the ELLs in their classrooms to be successful. However, teachers were divided on whether they actually put these beliefs into practice. Student interview participants provided additional suggestions for teachers to use.

Research Question 4

What types of support are teachers receiving, and what additional resources could they use to meet the needs of ELLs?

When asked on the open-ended item about the challenges they face with ELLs, several teachers mentioned not having the proper resources and needing translators. For example, one teacher wrote on an open-ended item, “I need a Para or a co-teacher to help with differentiation of instruction.” Similarly, a teacher I interviewed commented, “I don’t have resources. If they had translators ... something they could put the English word in like evaluate and it would mean this is their language and they can see the association and hear it.” During another interview, a teacher suggested a phone translation service she had used in a previous job at a hospital. Another teacher I interviewed said, “I wish I had more help. More than a few of my 28 ESOL kids have fallen through the cracks because of class size, lack of time, and lack of knowledge.”

A few teachers wrote specifically about textbooks. The following comments were made:

(1) “Textbooks are just not well adapted to ESOL students,” (2) “I do not have a text with Spanish support – this is to their disadvantage,” and (3) “ESOL students would benefit most from a parallel language textbook.” Similarly, many teachers reported that they would like more materials in the native language of their students, primarily Spanish. Challenges reported on the questionnaire included not having materials with

Spanish directions or a glossary in the students’ native languages. One teacher brought it closer to home—“you can find books that have things written in Spanish and English, but *our* [italics added] standards need to be in 2 languages.”

On the open-ended items and during the interviews, the teachers made a number of suggestions about how professional development would help them teach the ELLs in their classrooms. For example, five teachers on either the open-ended items or during an interview professed a desire to learn or become more proficient in Spanish. Table 7 lists the other comments the teachers made on open-ended items and during interviews about wanting professional development to help teach the ELLs in their classrooms.

Table 7

Comments Made by Teachers to the Open-ended Questions and During Interviews about Wanting Professional Development

Teachers need intensive training on how to teach ESOL students all throughout the year. A one hour inservice at the beginning of the year is not sufficient.	It’s the training, any types of methodology that would be useful. I absolutely want professional development.
I would like to have more professional development on teaching ESOL students.	I do not have the training or resources to do these students justice.
The ESOL students are missing out on a	I would say that after this many years, I still

lot, and I think we need proper training. don’t know how to modify.

And again maybe I can learn something different through some kind of training or something. I just don’t know how to break that barrier right now. It was useful when our ESOL teacher went to Mexico and saw the schools and brought that info back. It helps when I understand the culture, understand where they are coming from.

The interviews with the teachers indicated that more collaboration and communication is needed between mainstream mathematics teachers and ESOL teachers. For example, four of the teachers interviewed suggested they need more help from the ESOL teacher. Specifically, one teacher commented, “I would like help from the ESOL teacher with the terminology, test taking skills, instructions on tests. I don’t like that the international center does their job, the ESOL person does theirs, and we do ours. There is no collaboration there.” Similarly, when asked what more the ESOL teacher could do to help her, another teacher said, “What can I do? What can I expect? Help me personally, know what the bar is. Modify tests, what’s their culture, if I needed them to finish something, they could always do that with her.”

The teacher interviews also suggested that the relationships between the mathematics teachers and ESOL teachers appear strained. For example, during the interviews, teachers made the following comments:

- I would LOVE to have help with grading the assessments. I watch the ESOL teacher be able to shut her notebook and go, and say see you tomorrow!
- The situation is me chasing her down, and her not telling me. I do collaborative (with special ed) and I know how that relationship works, and that relationship should be the same with the ESOL teacher. I feel like tell me something. I

would like her to modify tests if she were able to. Let me know, this child has no chance of doing this right now, you know, this is what she can do, this is what she can't do. It's a guessing game.

- I think I have one (an ESOL student) in here now, see the thing of it is, when they come in, they don't let us know, we don't get anything on the kids once they come in, we have to as a teacher find out all that for ourselves. Our schedules are not the same. More communication would be helpful.

Two of the teachers I interviewed suggested that students need more ESOL instruction. For example, a teacher at a school who did not have a formal ESOL program commented, "I think each school should have at least one ESOL class." Another teacher I interviewed said, "I think some of them need more one-on-one structured instruction than one hour a day."

Research Question 5

What are the experiences of ELLs in middle school mathematics classrooms?

Despite the common assumption that mathematics is a relatively easy subject for ELLs, after talking with students, I found the opposite to be true. Two of the students even said mathematics was their hardest subject to understand. When asked about the difficulties the students face in math class, they all made some reference to "the words." When asked to recall a time when something was easy in math and why, Diego, an eighth grade native Spanish speaker, said, "Because I understand the words."

The four students I interviewed agreed with the teachers I interviewed that reading, and more particularly writing, make mathematics difficult for them. When asked what they do not like about mathematics or what was hard for them, two students answered, "the writing." For example, one student said, "We have to write letters, like words, like three thousand," and another student said, "They write the numbers in

words, and sometimes I cannot read the numbers." When I asked for some examples of how writing was difficult, one student said, "Find the volume, the area, the length, and y." Another student said "Mathematics with a lot of words" was hard, and another said, "word problems hard." These answers continue to point to language comprehension. When I asked one student to remember a time when he could not do something in math class and why, he said, "Because I didn't understand the words."

These students had different experiences with assessment in their mathematics classrooms. Trong, an eighth grader from Vietnam, recalled when he first came to the United States in sixth grade. He said he had a hard time understanding the teacher, so he did not really know what was going on. On the tests, the teacher gave him a "special test." He said, "If there were a lot of words, she just give me math problems." However, he told me he got A's because "if I make bad, she don't count it." Two other students reported going to their ESOL teacher for help with assessments. During the interviews, two out of the four students mentioned the standardized test given in the state being hard to understand and having a lot of word problems.

All of the students expressed a desire to have more materials in their native language. They also believed they learn best when working in groups or with a friend. The students also reported that it would be helpful to have extra time with assignments, but they usually did not get it. Two students talked about how they were sometimes confused because their teacher worked out the problems differently than how they had learned the process in Mexico. Three of the students said there was not anyone at home who could help them with their math.

"It's hard because math has a lot of words."

--Carlos, 6th grader from Mexico

Summary and Discussion

Through open-ended item responses on the questionnaire, the teachers reported that they believed ELLs have difficulties with the amount

of reading, word problems, and specialized vocabulary in mathematics classrooms. Teachers also reported a lack of time as being a challenge to meeting the needs of ELLs. Additionally, through interviews, the teachers reported that ELLs do not have support from home when it comes to school work.

The students interviewed reported having difficulties in mathematics class because of the number of word problems and words they could not understand. These students wished they had more materials in their native language and more time to complete assignments. In addition, they felt they learn best when working in a group.

In the words of one teacher I interviewed, “One thing I like about mathematics is that mathematics is a link. You need to know one thing before going to the other thing. I think education is the same way. And I think our education working with these kids the link should be even tighter there, and that’s *not* [italics added] happening.” I believe collaboration must be practiced and discussed for mainstream teachers to be aware of the ESOL teachers’ responsibilities versus their responsibilities in the classroom. Teachers also need to overcome the poverty of language learning through professional development. For example, despite many teachers’ beliefs, proficiency in a native language facilitates English acquisition and leads to higher academic achievement (Lee, 2002), so students should be encouraged to speak their native language at home.

Teachers in this study reported wanting more effective resources, particularly in students’ native languages and geared toward the state curriculum. The Principles and Standards for School Mathematics (National Council of Teachers of Mathematics [NCTM], 2000) included equity as the first principle for reform of mathematics education. According to NCTM, excellence in mathematics education requires “raising expectations for students’ learning, developing effective methods of supporting the learning of mathematics by all students, and providing students and teachers

with the resources they need” (p. 12). Mainstream mathematics teachers must to apply this principal on a daily basis to the ELLs they teach.

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