A Survey of English Language Learners’ Perceptions of Characteristics of Quality High School Math Teachers

Tiffany A. Martinez, Shannon O. Sampson and Kelly D. Bradley

University of Kentucky
Abstract

Recent federal legislation has led to increased interest in teacher quality, including attempts to understand students’ perceptions of quality teaching. With a substantial increase in English language learners (ELLs) in U.S. schools during the past ten years, it is important to find out what these students believe constitutes a quality teacher in order to help teachers educate these students more effectively and efficiently. The current study uses the Mathematics Student Survey, which was constructed by the research team, to survey ELLs on their perceptions of the qualities of the best High School math teachers. Participants for this study were approximately 50 students classified as ELLs from one public high school in a southeastern state.
A Survey of English Language Learners’ Perceptions of Characteristics of

Quality High School Math Teachers

The No Child Left Behind (NCLB) Act of 2001 and the reauthorization of the Individuals with Disabilities Education Improvement Act of 2004 (IDEA) have increased the accountability of schools for students’ progress in mathematics and for placing highly qualified teachers in the classroom (Individuals with Disabilities Education Improvement Act, 2004; No Child Left Behind Act, 2002). According to NCLB, all teachers in core academic areas, including mathematics, must be highly qualified by the end of the 2005-2006 school year. A “highly qualified teacher” is a teacher with full certification, a bachelor’s degree, and demonstrated competence in subject knowledge and teaching (Smith, Desimone, & Ueno, 2005). IDEA 2004 affirmed the need for teachers of students with disabilities to have content preparation in the academic subjects they teach. These heightened standards and sanctions for not meeting those standards have led to increased interest in teacher quality (Brekelmans, Wubbels, & Creton, 1990); this study explores the extent to which NCLB’s definition of teacher quality agrees with ELL students’ perceptions of teacher quality.

During the 2003-2004 school year U. S. school districts reported an enrollment of 5,127,034 English Language Learners (ELLs), accounting for 10.3% of the total reported public school enrollment. This is an increase of 43.9% over the reported ELL public school enrollment in 1993-1994 school year (Padolsky, 2005). There are over 400 languages spoken by ELLs nationwide, but the great majority of ELLs (79%) claim Spanish as their native language (Padolsky, 2002). This substantial increase in ELLs over a period of ten years has led to recent federal legislation which indicates the importance of educating these students. In fact NCLB requires that all children, including ELLs, demonstrate proficiency in English language arts and
mathematics by 2014 (No Child Left Behind Act, 2002). Because of the high expectations for these students and the emphasis on teacher quality, it is very important that research attempts to understand what ELLs feel are the characteristics of quality teachers.

What is teacher quality?

There have been many studies searching for the essence of quality teaching and the results have varied depending on the group surveyed. Research on teacher quality and effectiveness has primarily focused on in-service and pre-service teachers’ beliefs about good or effective teaching and the characteristics of quality teachers. Some research has focused on student perceptions of teacher quality, but none has specifically focused on ELLs perceptions of teacher quality.

In-service and pre-service teachers have frequently been utilized to examine characteristics of quality teachers. Pre-service teachers have identified the following general qualities of effective teachers: student centered, effective classroom-and-behavior manager, competent instructor, ethical, enthusiastic about teaching, knowledgeable about the subject, and professional (Minor, Onwuegbuzie, Witcher, & James, 2002). Effective or good teachers have also been shown to be caring, patient, polite, not boring, and organized (Murphy, Delli, & Edwards, 2004).

Effective mathematics teachers have been described in the literature as knowledgeable in the mathematics they teach, enjoying teaching, able to clearly explain mathematics, able to use manipulatives and concrete objects to help students understand math, and able to work with all students to help them achieve their potential (Strickland & Page, 1991). Evertson, Emmer, and Brophy (1980) compared the practices of effective and ineffective mathematics teachers. They found that more-effective mathematics teachers used substantially more class time to present
content and discuss the content with students, manifested behaviors indicative of higher expectations for their students, and exhibited stronger management skills (e.g. enforced rules to a greater degree, accepted less disturbance, had more effective transitions, and monitored pupils better). They also found that more effective mathematics teachers exhibited less anxiety, more confidence, greater task orientation, and more enthusiasm. Pre-service teachers’ perceptions of their effectiveness as mathematics teachers have also been shown to be influenced by past experiences with mathematics (Swarz, 2005).

Teachers’ views of effective teaching have been demonstrated to change over time. Wilson and Cameron (1996) examine perceptions of effective teaching in pre-service teachers. They found that over the course of the teacher education program, students developed from a ‘teacher centered’ to a ‘pupil centered’ view of effective teaching, moving from an emphasis on smooth lessons to an emphasis on students attaining higher level cognitive outcomes.

The existing literature on students’ perceptions of good teachers is highly varied. Palmer (1999) conducted a study designed to identify the attributes of high quality science teachers at the junior high school level, from the perspective of students who had recently finished a given class. Results indicated that students placed a high value on hands-on activities, the creation of interesting lessons using engaging instructional strategies, the ability to clearly explain lessons, enthusiasm for science, a sense of humor, friendliness, and approachability.

Beishuizen, Hof, van Putten, Bouwmeester, and Asscher (2001) asked students from four age groups (7, 10, 13, and 16) and teachers from primary and secondary schools to write an essay on what it means to be a good teacher. Primary school students described good teachers as competent instructors (focusing on transfer of knowledge and skills) and secondary school students emphasized relational aspects of good teachers. Teachers also felt it was important for
good teachers to establish personal relationships with their students. Therefore, older students’ views of quality teaching were more similar to teachers’ views of quality teaching than were younger students’ views.

Murphy, Delli, and Edwards (2004) found a similar progression of views in their study that examined second grade students’, pre-service teachers’, and in-service teachers’ views of the good teachers and good teaching. Caring, patience, not being boring and politeness were characteristics that the three groups agreed were qualities of a good teacher. The results seemed to show a progression in which people gradually acquire similar beliefs about the characteristics of good teachers. The authors felt this suggested the beliefs of the individual groups progressed in sophistication from second graders to in-service teachers.

Although there has been much research examining teacher quality, relatively little research has examined students’ perceptions of teacher quality, especially ELLs’ perceptions of teacher quality. However, given the recent emphasis on teacher quality and student achievement in mathematics, particularly ELLs’ achievement in mathematics, it is important to find out what ELLs believe constitutes a quality mathematics teacher. Understanding these perceptions will assist teachers with their classroom practices and help them understand how to better educate these students.

The purpose of the current study was to corroborate and expand the teacher quality literature by examining high school ELLs’ perceptions of the characteristics of high quality mathematics teachers. It is part of a larger study of teacher and student perceptions of quality of instruction and the relationship between classroom practices and assessment outcomes in the
content area of algebra funded by Western Kentucky University through a Kentucky Educational Professional Standards Board grant.1

Methods

Participants

Participants for this study were 52 students classified as English Language Learners (ELLs) from one public high school in a southeastern state. For the purposes of this study, ELLs are defined as students for whom a language other than English is his/her first language and who receive English as a Second Language (ESL) services in school. ELLs in mathematics classes of participating teachers were the target population for this survey. All mathematics teachers in the high school were approached and asked to indicate their willingness to participate in a larger study in which mathematics teachers and students responded to a survey of their perceptions of mathematics teacher quality. Approximately 750 students responded to the survey, 51 of whom were ELL students. Of the ELL students, there were 29 males and 22 females.

Instrument

The Mathematics Student Survey is a selected response, pencil-and-paper survey, developed by two of the co-authors after a thorough review of the literature. It was used to survey participants on the qualities of the best math teachers they know. The survey consisted of 32 qualities of the best teachers. Some examples of items include: The best math teachers I know have high expectations for students, and The best math teachers I know emphasize learning the facts/rules. Students were asked to use a four point Likert-type scale (strongly disagree, disagree, agree, strongly agree) to rate their agreement level with each statement. The Mathematics Student Survey also included open-ended questions asking students to list the two qualities they

1 Western Kentucky University; KY EPSB ; K. D. Bradley (P.I.), Pilot Study: Assessing Quality- A Macro versus Micro Approach to High School Mathematics Education. ($36,452); 7/1/04 – 6/30/05.
feel are most important and how they would describe the best math teachers they know. Students were asked several demographic questions, including information about their current grade level, grades they typically receive in math classes, if they are currently taking an English as a Second Language (ESL) class, and information about their current math class.

Procedures and Data Analysis

The survey was distributed to students in participating math classes in the target high school as part of a larger study Assessing quality of high school mathematics instruction. Students completed a mathematics assessment as part of the larger study and then completed the Mathematics Student Survey. Two of the researchers assisted in the administration of the survey in a class with many Spanish speaking ELL students to serve as English-Spanish translators. Spanish speaking students were given the option of answering the open-response questions in Spanish. Questions from other students were answered in English as thoroughly as possible.

Data were collected and entered into e-Listen software utilizing the data pump option. Surveys were deemed usable if 70% of the survey was completed. Given this is a perception survey instrument; missing data were treated as missing as it is reasonable for the students not to respond to every question.

Data from the e-Listen software were entered into Minitab software, version 14, software for analysis. Descriptive statistics were run for each item, including the item’s mean and standard deviation. These descriptive statistics were used to rank order the items by mean. Correlations were run between all items. Two-sample t-tests were run between all items and gender, all items and whether or not the student liked math, and all items and whether or not the student felt like they learned from their math class. The data were then split into three groups: 1) those students who felt they learned from their math class, 2) those who felt they did not learn from their math
class, and 3) those who did not answer that item. Descriptive statistics, including mean and standard deviation were then run on two of the groups (those students who felt they learned from their math class and those who felt they did not learn from their math class).

Results

The rankings of the thirty-two items with their means and standard deviations are reported in Table 1. The five most highly rated items are The best math teachers I know... 1) are knowledgeable in math, 2) recognize every student has the right to be educated, 3) provide a safe atmosphere for students. 4) have the ability to communicate to all students regardless of ethnicity or heritage, and 5) have a neat and organized classroom. The five lowest ranked items are The best math teachers I know... 32) use student results on state assessments to guide planning and instruction, 31) are flexible, 29) use student results on classroom assessments to guide planning and instruction, 29) individualize instruction, and 28) incorporate technology in their instruction on a regular basis.

Correlations were estimated between all items. The highest correlation was $r=0.756$ between the items The best math teachers I know use student results on classroom assessments to guide planning and instruction and The best math teachers I know use student results on state assessments to guide planning and instruction. All other correlations fell below this level. This correlation between items that are logically related indicates that the students did seem to be reading and thinking about the survey as they participated in it.

Two-sample t-tests between all items and gender did not yield any significant findings. Two-sample t-tests between all items and whether or not students like mathematics, however, did yield some significant findings. Students who like math (n=40) were more likely to agree that the best math teachers emphasize multiple ways of solving problems, $p=0.056$, and were more likely
to agree that *The best math teachers I know are patient*, \( p=0.039 \). Two-sample t-tests between all items and whether or not the students felt they learned what they needed to in their math classes also yielded some significant findings. Students who felt they learned what they needed to in their math classes \( (n=38) \) were more likely to agree that *The best math teachers I know have high expectations for students*, \( p=0.057 \), *have the ability to communicate with all students regardless of ethnicity or heritage*, \( p=0.062 \), *communicate daily objectives to the students*, \( p=0.016 \), *motivate students to become actively involved in the learning process*, \( p=0.006 \), *teach according to a task oriented plan*, \( p=0.003 \), and *use student results on classroom assessments to guide planning and instruction*, \( p=0.046 \).

After the responses were split into three groups (students who felt they learned what they needed to learn in their math classes, students who felt they did not learn what they needed to learn in their math classes, and students who did not answer that item) the items were then ranked. Item rankings with their means and standard deviations for the students who felt they learned what they needed to learn in their math classes \( (n=38) \) and those who felt they did not learn what they needed to learn in their math classes \( (n=13) \) are presented in Table 2 and Table 3, respectively.

The five most highly rated items for both students who feel they have and have not learned what they needed to learn in their math classes are the same items in different orders as when the two groups were combined (*are knowledgeable in math, recognize every student has the right to be educated, provide a safe atmosphere for students, have the ability to communicate to all students regardless of ethnicity or heritage, and have a neat and organized classroom*). The five lowest rated items for students who feel they learned what they needed to learn in their math classes are *The best math teachers I know...* 32) are flexible, 31) use student results on state
assessments to guide planning and instruction, 30) incorporate technology in their instruction on a regular basis, 29) individualize instruction, and 28) use student results on classroom assessments to guide planning and instruction. The five lowest rated items for students who did not feel they learned what they needed to learn in their math classes are: The best math teachers I know 32) use student results on classroom assessments to guide planning and instruction, 29) individualize instruction, 29) use student results on state assessments to guide planning and instruction, 29) teach according to a task-oriented plan, and 28) have a quiet classroom.

Discussion

The present study surveyed 51 students classified as English Language Learners in order to corroborate and expand the teacher quality literature by examining high school ELLs’ perceptions of the characteristics of high quality mathematics teachers. The results of this study seem to support what previous research has found related to characteristics of teacher quality.

The five most highly rated items are The best math teachers I know 1) are knowledgeable in math, 2) recognize every student has the right to be educated, 3) provide a safe atmosphere for students, 4) have the ability to communicate to all students regardless of ethnicity or heritage, and 5) have a neat and organized classroom. These characteristics are similar to the themes identified by Minor, Onwuegbuzie, Witcher, and James (2002): student centered, effective classroom and behavior management, competent instructor, ethical, enthusiastic about teaching, knowledgeable about the subject, and professional. The ratings from the current study seem to favor the student-centered theme most heavily. The items recognize every student has the right to be educated, provides a safe atmosphere for students, and has the ability to communicate to all students regardless of ethnicity or heritage seem to fall into the student-centered theme. The item is knowledgeable in math falls into the theme of knowledgeable about
the subject, and the item *have a neat and organized classroom* falls into the effective classroom and behavior management theme. Open-ended responses from the students supported these three themes. Some examples of responses include: “Someone who teaches strictly according to her plan, gives homework everyday, and has strong communication skills;” “They are patient, have strong communication, help you all the time, and have a good sense of humor;” and “very kind and patient. She will always help you when you need it. She’s flexible, but has a schedule planned everyday.”

Many ELLs are immigrants that bring certain challenges for teachers working with them. Holman (1997) states that in order for Hispanic immigrants to be successful in the classroom, it is important for teachers to lessen the intimidation factor and remove the language barrier among other things. The students in this study, many of whom are Hispanic immigrants, seem to support these statements. The item *The best math teachers I know provide a safe atmosphere for students*, ranked third overall, would suggest that students do not like to feel intimidated in the classroom and feel intimidation hinders their ability to learn. The item, *The best math teachers I know have the ability to communicate to all students regardless of ethnicity or heritage*, ranked fourth overall, would suggest how important it is for teachers to remove the language barrier to the greatest extent possible.

One of the most intriguing findings of this study are the differences between students who feel they learn what they needed to learn in their math classes and those who feel they did not learn what they needed to learn in their math classes. It is important to keep in mind that the groups were small and not of equal size, which limits the ability to generalize these findings. Thirty-eight students felt they learned with they needed to learn from their math classes while 13 students felt they did not learn what they needed to learn from their math classes. Both groups of
students rated the same five items most highly; however, there were differences in the five lowest rated items for the two groups. Students who feel they learned what they needed to learn in their math classes rated the item *The best math teachers I know teach according to a task-oriented plan* more highly than did students who feel they did not learn what they needed in their math classes. Students who feel they did not learn what they needed to learn ranked the following items higher than did students who felt they learned what they needed *The best math teachers I know incorporate technology in their instruction on a regular basis* and *The best math teachers I know are flexible*.

It is unclear from the results why these two groups of students would rate these items differently. It may be that students who feel they did not learn what they needed to learn feel they need more support from teachers in order to do well. This support may include using different mediums, such as technology, during instruction or being flexible with students experiencing difficulty. It may be that students who felt they learned what they needed to learn have less difficulty with mathematics in general, and therefore do not feel they need that type of support in order to succeed.

Studies have demonstrated that when students make the transition to junior high school they perceive their math teachers to be less supportive than the teachers they had the previous year (Midgley, Feldlaufer, & Eccles, 1989). These systematic changes in the classroom environment after the transition to middle or junior high school contribute to a decline in achievement related to attitudes, values, motives, and behavior for some students, especially low achieving students. It may be that like the above mentioned low achieving students, the students who feel they did not learn what they needed to learn in their math classes are more vulnerable to perceived changes in support from their teachers and therefore rated those items higher.
Contribution and Limitations

There is a relative void in the literature regarding students’ perceptions of quality mathematics teachers, especially ELL students’ perceptions. This research will help expand the research on students’ perceptions of quality mathematics teachers and help establish literature related to ELLs’ perceptions of the characteristics of quality mathematics teachers. However, the small and limited sample size is a limitation. A larger and more representative sample would allow for more power and more generalization of results. Still, the current study provides a foundation to build upon within a limited literature base.
References


