In Their Shoes

Teachers Experience the Needs of English Language Learners through a Math Simulation

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Given the increase in the number of culturally and linguistically diverse students in American schools, it is vital for teacher education programs to address the needs of English Language Learners (ELLs) in their courses. Mainstream, general education teachers who did not previously experience this student population in their classes are now seeing high numbers of ELLs among their students. Therefore, all teachers, not just specialist English as Second Language (ESL) or bilingual professionals, need to be prepared to work with ELLs (Lucas & Grinberg, 2008).

Statistics available from the National Clearinghouse for English Language Acquisition (NCELA, 2006) show that more than 10% of the K-12 student population across the United States is comprised of ELLs, which accounts for over five million students in our schools. The greatest numbers of these students are found in California, Florida, Illinois, New Mexico, New York, Puerto Rico, and Texas. However, states such as Arkansas, Alabama, Colorado, Delaware, Georgia, Indiana, Kentucky, Nebraska, North Carolina, South Carolina, Tennessee, Vermont, and Virginia have experienced more than 200% growth in the numbers of ELLs in their schools from1995 to 2006 (NCELA, 2006). The need to prepare teachers to work with this population of students is pressing across the U.S., and is even more salient in contexts such as Indiana, where the ELL K-12 student population has increased by 408% since 1990 (Indiana Department of Education, 2010).

These rapid changes put pressure on teacher education programs to prepare teachers to work with ELLs (Athanases & de Oliveira, 2011). Too many teachers view mainstream U.S. culture and monolingualism as the norm, thus ignoring linguistic diversity (Osborn, 2007) and perpetuating misconceptions about teaching ELLs (de Jong & Harper, 2005). These considerations are relevant in the context of teacher preparation, as teachers' attitudes are likely to impact what and whether ELLs learn (Echevarria & Graves, 2007).

Teachers' attitudes and beliefs about ELLs can be influenced by their lack of empathy for these students' experiences and backgrounds. Many pre-service and inservice teachers need not only to learn strategies to work with ELLs but also to feel what it is like to be language learners themselves. The monolingual, predominantly White, teacher population that is still found in today's schools must engage in language experiences that will help them understand the difficulties and needs of ELLs in their classrooms.

To that end, this article describes a math simulation activity in Brazilian Portuguese designed to increase teachers' awareness of what learners feel when they are immersed in a language they do not understand. This simulation has been utilized in K-12 ESL methods courses and in professional development programs in Indiana. I contextualize the simulation through reflection questions that teachers address in their discussion after the simulation. As a way to demonstrate how teachers have engaged in the simulation and developed more empathy for ELLs, this article includes excerpts from teachers' reflections, collected over four years in different contexts.

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Theoretical Framework

Even though diversity is predominant in schools, more than 90% of pre-service teachers in teacher education programs across the U.S. come from White, middle class, and non-urban backgrounds (National Collaborative on Diversity in the Teaching Force, 2004; Nieto, 2000), and have little experience with learning other languages. Given this disparity, it is imperative that teachers be sensitive to the diverse backgrounds of their students and know how to build on these students' cultural and linguistic backgrounds and experiences (Brooks & Karathanos, 2009; Lee, Butler, & Tippins, 2007).

Multicultural education literature calls for teachers to be *culturally* responsive (Artiles, Trent, Hoffman-Kipp, & Lopez-Torrez, 2000; Gay, 2002; Villegas & Lucas, 2002). In addition to being culturally responsive, teachers must be *linguistically* responsive, able to respond to the linguistic experiences and needs of students, especially ELLs (Lucas, Villegas, & Freedson-Gonzalez, 2008).

Appropriate preparation for teaching ELLs includes at minimum: (a) a strong background and experiences with second language learning principles and practices; (b) knowledge about the differences between conversational language proficiency and academic language proficiency; (c) the importance of access to comprehensible input and opportunities for producing output for meaningful purposes; (d) the role of social interaction for the development of conversational and academic English; (e) the positive impact of strong native language skills on ELLs' achievement; (f) the necessity of a welcoming classroom environment for ELLs; and (g) the need for explicit attention to linguistic form and function (Lucas, Villegas, & Freedson-Gonzalez, 2008).

Preparing teachers to meet the needs of ELLs in their classrooms is a tall order for many teacher education programs (de Jong & Harper, 2005). Teacher preparation for ELLs includes sensitizing prospective

teachers to these students' needs. As part of that preparation, I am suggesting that teachers should have experiences in which they feel what it is like to be a language learner (de Oliveira & Shoffner, 2009).

Math Simulation and Teaching ELLs

The math simulation activity described here is, therefore, designed to immerse teachers in a language they do not understand so that they can experience the linguistic challenges that ELLs might experience in a classroom where English is the medium of instruction. As one teacher described it, the simulation "puts you in the ELL kids' shoes." I selected the content area of mathematics because mathematics is generally viewed as a universal language (Hansen-Thomas, 2009) that does not involve much use of language (Schleppegrell, 2007).

The intent of this activity, however, is to help teachers move beyond this narrow view and recognize that all content areas, including mathematics, are highly dependent on language for meaning-making (Schleppegrell, 2004, 2007). Brazilian Portuguese was selected as the language of instruction for the simulation because it is my native language and one that is not taught as a foreign language in U.S. schools, thus limiting the possibility of students' previous exposure to this language.

The simulation is based on the following mathematical problem about fractions (So Matematica, 2006):

Brazilian Portuguese Version

1. *Observe a figura e responda as questões abaixo*:

a. *Em quantas partes iguais o retângulo foi dividido?*

b. *Cada uma dessas partes representa que fração do retângulo?*

c. *A parte pintada representa que fração do retângulo?*

English Version

1. Observe the figure and answer the questions below:

a. In how many equal parts was the rectangle divided?

b. Each one of these parts represents what fraction of the rectangle?

c. The painted part represents what fraction of the rectangle?

The simulation is divided into two phases. For Phase 1, I conducted the activity without using any ESL strategies, as described below. For Phase 2, I re-did the activity using ESL strategies and demonstrating what teachers can do to help ELLs understand the math content.

Phase 1

Thus, Phase 1 did not employ any ESL strategies. I read the activity out loud to participants, but instead of actually completing the problem, I read each part in different ways. First, I read the questions using a normal speech speed. After giving participants about 1-2 seconds of wait time, I re-read the questions, now very slowly but still with the same tone of voice. Again, I gave participants very little time to respond. Lastly, I read the questions for a third time, now very loudly and slowly. I also made comments about how they should know this material since they had studied several exercises about fractions, and I told them they should have reviewed the materials before coming to class, speaking in Brazilian Portuguese all of the time. I kept my hands behind my back to make sure I do not use them. After this, participants were asked to reflect on the following questions:

- What feelings did you experience during the simulation?
- What did you learn from it?
- How does this simulation apply to working with ELLs?

Participants answered these questions individually on a separate piece of paper. Then we had a whole-group discussion about their answers in order to find similarities and differences among participants' answers. Immediately after this, I re-did the simulation in Phase 2.

Phase 2

Phase 2 consisted of conducting the activity utilizing many ESL strategies. I demonstrated a variety of instructional strategies that teachers can use to support ELLs in the classroom. These strategies included: (a) clearly enunciating words; (b) enhancing the intonation of words; (c) using simple sentence structure and familiar words; (d) using gestures, visuals, manipulatives, and other graphics; (e) physically demonstrating certain words; (f) using dramatic gestures; and (g) reviewing after the lesson (Reiss, 2008). In addition, I often used the blackboard to write certain words down and to make connections between spoken and written language. I also reviewed some words and phrases that are important for the understanding of the math content.

After participants experienced this second phase of the simulation, they again reflected, using the following questions as a guide:

- What feelings did you experience during the simulations?
- What did you learn from them?
- What ELL strategies were used?
- How were they used?
- What were the differences between the first math simulation and this second simulation?
- How does this simulation apply to working with ELLs?

After the students answered these questions, we again had a whole-group discussion about their answers in order to find similarities and differences among participants' answers as well as between the two simulations. We focused mostly on the different ESL strategies used and highlighted which strategies are appropriate for different levels of language proficiency and which strategies would help all learners, not just ELLs.

In Their Shoes

Over the past four years, I have applied this math simulation with several different groups of pre-service and inservice teachers who have had varying levels of experience working with ELLs. A total of 152 pre-service and inservice elementary and secondary teachers have experienced this simulation. Following are some of their reflections, representative of the entire sample of reflections, which show key reactions, observations, feelings, and conclusions from the activity.

Phase 1

Upon a close analysis of the reflections from Phase 1, I found that the one word used the most to express participants' feelings was *frustration*. Teachers felt frustrated because they could not understand what was going on during the lesson. Most

reported trying to understand but being unable to without the teacher's help. They tried to pick up some words but still were not able to keep up as the "teacher" was speaking very fast and didn't seem to care about how the "students" were doing. Participants also explained that they still were not able to comprehend when the teacher spoke slowly or loudly. They reported such feelings as being *frustrated*, *helpless*, *tired*, *lost*, *rushed*, *discouraged*, *overwhelmed*, *uneducated*, *stupid*, *uncomfortable*, *confused*, *weird*, *alone*, *embarrassed*, and *exhausted*.

One elementary teacher observed:

> At first, hold on/slow down and I tried to use visual cues, but after a while, it was too much effort as I realized: (1) you were not going to slow down and (2) it would not have made a difference anyway. So, I just gave up…didn't listen.

Another teacher explained:

> I tried to understand what you wanted me/us to do but didn't know. I wanted to talk with my neighbor and ask her if she understood. That is more difficult than I thought. I can see how easily students can find themselves being "disruptive." This is what they experience when I am teaching especially when it is just me talking.

The feelings participants discussed were very similar for this phase of the simulation. One teacher reported that it helped her "to know that others did not get it either…" The following reflection highlights a few points that 90% of the participants made, either in their reflections or during our discussions afterwards:

> I felt uncomfortable and like I didn't want to be in the class anymore. I wanted to put my head down and hide so that I wouldn't be called on, and I wouldn't feel like the teacher thought I was stupid or not paying attention. I didn't like being in class! Of course, I knew it was a simulation, but if this had been real, I would have been very sad.

These words show that the teachers noticed that oftentimes ELLs' behavior in the classroom may not be directly associated with their lack of willingness to engage but rather with their difficulties with the language, as the linguistic and emotional challenges ELLs may face in the classroom are directly related to what the teacher does to help them understand the content. Another secondary teacher noted: "This is how my students feel and I can understand how and why they may shut down and become off task." One preservice elementary teacher summarized this experience as: "this was tiring; it took a lot of energy and attention to figure out the lesson."

Participants reported learning to develop "empathy for ELLs," to notice that "exposure to language ONLY doesn't work and repeating alone doesn't work," to realize that "it is not easy to stay interested when someone is trying to teach you something using another language" and "how easy it must be for our kids to feel overwhelmed." These comments summarize the major categories across all 152 participants. Teachers reported learning that "this simulation is similar to how ELLs feel in classrooms every day."

Phase 2

After the simulation including ESL strategies, teachers reflected on the differences between the first and second phases. They appreciated the extra time and energy the "teacher" put into the lesson and thought that the strategies used helped the "language learners" understand the lesson better. All but one teacher reported feeling "much, much less frustration" and felt more able to understand and process the material. One teacher reported feeling:

> …much more embarrassed. When I saw the other people around me responding to [the teacher's] questions, I felt more anxious. Why can't I understand what [the teacher] was teaching? [The teacher] tried to have students understand her questions through more visual aids. I know that I am supposed to understand more but I can't really catch up.

In a follow-up discussion, this teacher spoke of her feeling inadequate among her colleagues because she still wasn't able to understand what was going on, even with all of the different strategies and modifications being used. This gave this group of teachers a chance to discuss the difficulties of some ELLs and what else we can do as teachers to respond to ELLs' needs. We also discussed that "one size fits all" approaches to instruction do not work for ELLs.

Most teachers recognized major differences between the first and second simulations. For instance, a secondary science teacher wrote: "This simulation really pointed out a huge difference in the approaches to teaching. It made me think twice about the types of things I can do to help my science ELLs." One teacher noted the differences in the simulations due to the use of modifications and various strategies:

> This experience was much better because you used modifications, even though I still did not grasp all of the basic concepts…. Every strategy you used was important and each would be beneficial to different kinds of learners. As with any learner, one size does not fit all, so using a variety of strategies is crucial.

Another expressed how the second simulation directly affected her feelings, connecting them to what was done differently:

> I felt much better when the questions were broken down into parts. Each word was explained with hand gestures and pictures, and words were repeated (but not loudly or slowly). The visual aids made me feel a lot more confident about my answers. Asking the students to write the numbers on the board was great- the numbers look the same in English and Portuguese!

Some teachers described specific things I did to help them understand. One noted: "The pace of the lesson, the visuals, and having you pause to check for understanding made a huge difference. Explaining the language singular vs. plural helped a lot as well and is something I think teachers forget about doing." Another spoke of the different strategies used during the lesson and the connections between the language and the math content:

> The use of audiovisuals certainly aided PLLs [Portuguese Language Learners] understanding of the lesson. In addition, the signaling to the screen, for example to the rectangle was very effective. Writing down the symbols for fractions, parallel and perpendicular along with what they meant was good. It was great that you explained and wrote that the number and fraction word for eight (e.g., *oito* and *oitavo*) were different. Finally, when there were simple changes in a word you explained why that was (e.g., plural).

Teachers noticed a number of different strategies were used, and they described the following:

- Modeling;
- Directions given in steps;
- Repetition of key points;
- Paraphrases with extra information;
- Pauses;
- Checking for understanding and need for clarification;
- Opportunities for questions;
- Requests for feedback;
- Modeling writing and speaking;
- Writing the words on the board reinforcing what is said;

- ◆ Oral/written/visual supports;
- ◆ Nonverbal communication;
- ◆ Visual reinforcement;
- ◆ Vocabulary list given in the context of the explanations (not before);
- ◆ Opportunity to share in group;
- ◆ Use of multiple skills;
- ◆ Varied instruction;
- ◆ Realia.

As teachers discussed, the simulation helped them feel the experience of language learners and modeled for them some strategies that teachers can use with ELLs. The teachers recognized the huge differences between not being able to understand what was going on during Phase 1 and how much easier it was for them to process the math content once more strategies were employed in Phase 2. For those few moments, they felt what ELLs may feel on a daily basis in schools.

Conclusion

In an attempt to help both future and practicing teachers to better understand the experience of language learners, the participants discussed here engaged in a math simulation activity in Brazilian Portuguese. The goal was to increase teachers' awareness of how learners feel when they are immersed in a language they do not understand. This simulation activity was employed with several different groups over a period of four years. In all, 152 preservice and inservice teachers participated and experienced some of the feelings and linguistic challenges that ELLs in their current or future classes may experience.

As one teacher wrote in his reflection:

> Simulations help us to experience what the learner is seeing, hearing, and feeling during these lessons. It helps teachers understand that attention to language needs to be incorporated in every lesson.

Another wrote:

> As an exercise in education, I thought it [the simulation] highlighted the role empathy plays in the development of instructional strategies. Teachers really don't know what it's like until they've experienced it themselves. Empathy would drive a teacher to want to have a more informed approach.

Feeling like language learners, even if just for a few moments, can help teachers become more aware of what ELLs may experience. Exemplifying this, one elementary teacher wrote:

> This is important to experience so that you can understand what it may be like for some ELLs in the classroom. It is not as easy as it may seem. If you work with ELLs it is important to understand their situation.

Finally, as another secondary teacher stated, "this simulation places English speakers in the shoes of an ELL." Feeling like English language learners through a math simulation like this gives teachers the experience of being in ELLs' shoes.

References

Artiles, A. J., Trent, S. C., Hoffman-Kipp, P., & Lopez-Torrez, L.(2000). From individual acquisition to cultural-historical practices in multicultural teacher education. *Remedial and Special Education, 21*, 79-89.

Athanases, S. Z., & de Oliveira, L. C. (2011). Toward program-wide coherence in preparing teachers to teach and advocate for English language learners. In Lucas, T. (Ed.), *Teacher preparation for linguistically diverse classrooms: A resource for teacher educators* (pp. 195-215). New York: Routledge.

Brooks, K., & Karathanos, K. (2009). Building on the cultural and linguistic capital of English Learner (EL) students. *Multicultural Education, 16*(4), 47-51.

de Oliveira, L. C., & Shoffner, M. (2009). Addressing the needs of English language learners in an English education methods course. *English Education, 42*(1), 91-111.

de Jong, E. J., & Harper, C. A. (2005). Preparing mainstream teachers for English language learners: Is being a good teacher good enough? *Teacher Education Quarterly, 32*(2), 101-124.

Echevarria, J., & Graves, A. (2007). *Sheltered content instruction: Teaching English language learners with diverse abilities* (3rd ed.). Boston: Pearson/Allyn & Bacon.

Gay, G. (2002). Preparing for culturally responsive teaching. *Journal of Teacher Education, 53*(2), 106-116.

Hansen-Thomas, H. (2009). Reform-oriented mathematics in three 6th grade classes: How teachers draw in ELLs to academic discourse. *Journal of Language Identity and Education, 8*(2-3), 88-106.

Indiana Department of Education. (2010). *Indiana accountability system for academic progress*. Retrieved from http://www.doe.in.gov/data/

Lee, S., Butler, M. B., & Tippins, D. J. (2007). A case study of an early childhood teacher's perspective on working with English language learners. *Multicultural Education, 15*(1), 43-49.

Lucas, T., & Grinberg, J. (2008). Responding to the linguistic reality of mainstream classrooms: Preparing all teachers to teach English language learners. In M. Cochran-Smith, S. Feiman-Nemser, & J. McIntyre (Eds.), *Handbook of research on teacher education: Enduring issues in changing contexts* (3rd ed, pp. 606-636). Mahwah, NJ: Lawrence Erlbaum Associates.

Lucas, T., Villegas, A. M., & Freedson-Gonzalez, M. (2008). Linguistically responsive teacher education: Preparing classroom teachers to teach English language learners. *Journal of Teacher Education, 59*(4), 361-373.

National Clearinghouse for English Language Acquisition. (2006). *The growing numbers of limited English proficient students: 1993/94-2003/4*. Washington, DC: U.S. Department of Education, Office of English Language Acquisition.

National Collaborative on Diversity in the Teaching Force. (2004). *Assessment of diversity in America's teaching force: A call to action*. Washington, DC: National Educational Association.

Nieto, S. (2000). Placing equity front and center: Some thoughts on transforming teacher education for a new century. *Journal of Teacher Education, 51*(3), 180-187.

Osborn, T. A. (Ed.). (2007). *Language and cultural diversity in U.S. schools: Democratic principles in action*. Lanham, MD: Rowman & Littlefield Education.

Reiss, J. (2008). *102 content strategies for English language learners*. Upper Sattle River, NJ: Pearson.

Schleppegrell, M. J. (2004). *The language of schooling: A functional linguistics perspective*. Mahwah, NJ: Lawrence Erlbaum Associates.

Schleppegrell, M. J. (2007). The linguistic challenges of mathematics teaching and learning: A research review. *Reading & Writing Quarterly, 23*(1), 139-159.

So Matematica. (2006). *Exercicios de frações (Fraction exercises).* Retrieved from http://www.somatematica.com.br/soexercicios/fracoes.php

Villegas, A. M., & Lucas, T. (2002). Preparing culturally responsive teachers: Rethinking the curriculum. *Journal of Teacher Education, 53*(1), 20-32.