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PRACTICING BILINGUAL LANGUAGE USE IN A SCIENCE METHODS CLASS: PERSPECTIVES FROM A STUDENT TEACHER AND A TEACHER EDUCATOR

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This essay is a critical reflection that details the journey, methods, and lessons of a pedagogical partnership formed between Puneet, a teacher educator, and Yasmine, a teacher candidate, to critically reflect on the inner workings of a science methods class. In this class, teacher candidates learn science teaching methods and skills to become an effective elementary and middle school science teacher. Supported by the Branch Alliance for Educator Diversity (BranchED), we explored how bilingual language and culturally relevant teaching practice were used from both Yasmine's and Puneet's perspectives. In the next section, we discuss the context in which this partnership happened.

Yasmine's Introduction to the Study

Puneet and I worked on breaking down lessons in order to find different ways in which we could increase the use of multiple languages within the classroom. This was done by having a student partner—me—take notes and bring up the different ways in which bilingualism could be integrated into the lessons. We spent our meetings going over both our ideas, and we were able to see which methods improved the use of different languages within the classroom, and which methods were not as effective.

One of the lessons that we focused largely on was the STEM (science, technology, engineering, and mathematics) demonstrations. These demonstrations involved a discrepant event (an unexpected result). The demonstrations had a math application on a chart, and different situations of the event (different sizes, different amounts, different colors) engineered. For example, in one demonstration a student separated hot and cold water and colored it blue and red to see density differences. In this demonstration the rate of diffusion for different colors was in a chart. Puneet and I agreed that having the classroom collectively work on naming the different tools—the science instruments (like paper rulers, timers, plastic pipettes used for measuring, weighing etc, in the STEM demonstrations)—would be an effective way to encourage Spanish speakers to feel comfortable speaking in their native language.

We even gave the students an opportunity to present their STEM demonstrations in Spanish/have Spanish terms integrated within their trifold (the larger poster boards that showed the science concepts, had translations in Spanish and English for groups that chose it, and math charts). I believe that doing these activities allowed Spanish-speaking students to feel more comfortable participating and conversing in their native language. This is because I was able to see my classmate, who is a native Spanish speaker, teach the entire STEM demonstration to an elementary student in Spanish.

We continued trying to find ways to encourage Spanish use by having Puneet give instructions for an assignment in Spanish. This was an event that taught me how important it is to be vulnerable in the classroom, especially because it shows students that learning is versatile and everyone is in the process of learning something all the time.

Because of the study, Puneet was provided with the opportunity to find different methods of incorporating bilingualism into her classroom. As we went through this journey, I was able to see just how important the student voice is, and I was also able to gain an insight to just how important it is to be an educator that creates a clear path of communication for students. This is knowledge that I owe to my participation in the study, as well as to Puneet's mentorship.

Puneet's Introduction to the Study

The class I teach, Science Methods, prepares teacher candidates to conduct STEM demonstrations in the community. I think it is important for teacher candidates to be able to translate science instruments in Spanish and English because those terms are not used in everyday language but could possibly provide a bridge to speak Spanglish (a mix of Spanish and English) or incorporate cognates (words from different languages that have similar meaning) into STEM demonstrations. For example, la regla or ruler was incorporated into the STEM demonstrations to measure the distance foam traveled in one demonstration. Student candidates also came up with other uncommon science instruments like a tampon, which can be used to clean up spills in science demonstrations. This has a different pronunciation in Spanish (tampón versus tampon) in English. The student candidates were careful to pronounce names in Spanish correctly and to translate when appropriate.

The city in which this study took place is located along the U.S. Mexico border, situated between Nuevo Laredo, Tamaulipas, Mexico, and Laredo, Texas, in the United States. In this context, it is important to note that I was aware of the complicated history student candidates experience of language and policies of discrimination in the school system. Student teachers spoke varying levels of Spanish. It is generally known that students are not comfortable speaking Spanish in classes. I was not sure how language is perceived from teacher candidates' perspectives, but in the school districts, teacher candidates often tell stories of how they were forced to transition to English in the second grade and/or were told not to speak Spanish in school.

So, I knew there are forms of "linguistic terrorism" happening or that have happened in the past. Linguistic terrorism is a term developed by Katherine Christoffersen in an article about language ideology in the Rio Grande Valley. She uses this term to describe "hostility Chicanos face from both English and Spanish speakers about their bilingual language varieties" (Christoffersen, 2019, p. 138). I wanted to explore this issue in my classroom and support the use of Spanish in instruction so policies/ideologies might change in the future. I struggle with Spanish myself, so I was excited to begin this partnership to learn more Spanish and to challenge myself alongside other Spanish learners.

The following sections of our essay offer equity of voice in our reflections. In the first section below, Yasmine offers her realizations about the partnership. In the second section, I talk about

situations that happened and changing perspectives on learning as partners. We agreed on a methodology designed to critically reflect on our weekly discussions called concentric circles. The use of concentric circles is a reflective process where the specific focus is on the narrative, the decision junctures, and how struggle was made from experiences. In this way, reflection offers a place to describe the critical moments and transformations in teaching practice. Concentric circles are collaborative and are an “iterative process allowing participants to (re)visit the narrative multiple times, each time providing a deeper understanding of the experience and allowing for a repositioning of the self” (McHatton, Parker, & Valice, 2013, p.3).

Using this method, we began our weekly discussions by reading our individual reflections to each other. The other partner listened and took notes, and focused on critical moments or critical decisions that were made about teaching practice. We discussed the impact of decisions to speak Spanish and/or English in class and the relationship to science demonstrations. After each narrative was read in turn, we asked questions and thought about the reflection from the perspective of our partner. After this discussion, we repositioned our narrative, and collectively created a new summary reflection based on the critical discussion.

In the following sections, Yasmine and I reflect on the critical junctures within these discussions, and the resulting ideas we had about the experiences that blossomed from the partnership.

Bilingual Language Use from Yasmine’s Perspective

During my time working on the pedagogical partnership with Puneet, I was given the opportunity to see the impact that showing vulnerability had on the classroom, as well as the different ways that an educator can use their voice to bring up topics that shine light on heavy conversations. This portion of our essay presents how these realizations took place and how the mutual respect that Puneet and I had for each other helped create a classroom environment that is inclusive of bilingual students and their culture.

Throughout the time that I spent with Puneet, I was able to discover how to practice the concentric circle method and how it allowed us to create a bond. This method facilitated our discussion of the classroom events that took place, provided Puneet the opportunity to analyze her lessons, and afforded both of us the opportunity to think of different ways that she could incorporate diversity throughout her lessons. For example, we discussed the different ways that including more culturally specific content could help students feel like they were also a part of the lesson. We even went so far as to try having a lesson where the instructions were read in Spanish and English. By doing this, I was able to see first hand how something as simple as reading directions in Spanish helped the Spanish speakers in the classroom feel included and seen. I believe that this small step allowed all of the bilingual students in the classroom to feel a bit more comfortable speaking their native language.

I also believe that because of Puneet’s willingness to be vulnerable, the classroom became a safer environment. Puneet did this by standing in front of the classroom and reading a set of directions that were written out in a language that she is currently learning. This was a vulnerable moment for Puneet because it broke the barrier for students. Puneet’s choice to do this allowed students to

see her as someone who is actively learning, rather than a knower of all. I believe that this changes the classroom dynamic in a positive way because it shows the students that every person in the classroom is a learner, which may encourage them to add in their own thoughts and ideas into the classroom discussion rather than being passive. Our partnership facilitated Puneet's desire and goal of having an inclusive classroom and modeled for teacher candidates the importance of being vulnerable in their own classrooms in the future.

Although the idea of providing feedback to my faculty partner seemed daunting and unnatural at first, I was quickly able to realize that this partnership would help both of us grow and improve. I was able to get an inside view of all the work that that teachers undertake to prepare the lessons provided for their students, and Puneet was able to view how her lessons were perceived by the students. I was quickly able to get out of the mindset of thinking that students should merely listen, and I was able to feel like I had an important role in the classroom. I believe that this allowed me to become a bridge, improving communication between the students and Puneet, which then opened even more opportunities to create a safe and comfortable environment for bilingual speakers.

Meeting weekly with Puneet also allowed me to realize the importance of ensuring that teacher candidates were going into the field with the idea of creating environments that were inclusive to all their students, rather than a specific group. I was also able to realize that being inclusive not only meant ensuring that students were seeing their language in the examples; it was also about allowing students to see issues that were present in their community and used as an important topic for debate. The weekly meetings that Puneet and I had were filled with reflection and new ideas. We were able to brainstorm together how we could incorporate difficult concepts, such as bridge building and inclusivity into the classroom. This allowed me to see the different methods and strategies that a teacher could use in order to create a positive environment for their classroom, all while testing them out in the classroom by observing the feedback given to me from my classmates. This circle of brainstorming, testing, and reflecting was what allowed me to change my original perception of the role of a student.

Through this partnership, I was able to see how there are many ways that a teacher can make a classroom inclusive for their students and the lasting impact that doing so has on the students present. I am grateful, however, that I was able to gain this knowledge as a student partner rather than as a student because I was able to gain insight from both perspectives. This meant I could speak to my fellow classmates about topics we went over in class and help share their ideas with Puneet. During our weekly sessions, we gathered this information and came up with different ways to incorporate it into the lessons. We discussed ideas that we both saw and agreed on, and even went over topics that we did not agree completely on. This allowed us both to see different perspectives and come to a middle ground. This worked because of our mutual goal of finding the best way to implement the use of bilingual language within the classroom.

During our time together, we were able to see how many conversations that were taking place were not being set in bilingual environments, and how bilingual students were left struggling to take part in conversations that played a significant role in their own lives. For instance, Puneet took the class to our Planetarium to show teacher candidates that teaching science can be fun and memorable. However, during our weekly meeting, we discussed how the showing was not

diverse in the characters that were used, and how there was no use of Spanish in the presentation. Puneet and I thought of several ways that this could be changed and concluded that incorporating Spanish subtitles could help young bilingual students to feel more included and to better understand the lesson. Our efforts to create environments that practice the use of Spanish can continue to be seen as we discussed how to better incorporate Spanish terms into the STEM demonstrations that are presented to students through family nights. Although there are still small changes, we both would like to see in the demonstrations, we were able to see the personal impact for student teachers when they used Spanish with young students.

Lastly, I believe that the work that I completed with Puneet not only helped both of us, but also each of the teacher candidates in the course. This is because they were able to see the vulnerability that Puneet was willing to show by allowing herself to be seen as both a teacher and a learner all while showing the immense effort that she was putting into creating lessons that were inclusive of bilingual students. I believe that this will allow the teacher candidates to put in the same effort and ideas into their own classrooms one day, and maybe even give them the courage to bring up difficult conversations with their students. This entire experience has allowed me to see the importance of creating safe and comfortable environments for all students, and I look forward to continuing working on our research this upcoming semester.

Prioritizing Equity Issues Through Critical Conversations Through Student Voice and Pedagogical Tools: Puneet's Perspective

In this section of our essay, I offer an explanation of what specific struggles were unearthed through the partnership and how the challenges created new opportunities for learning.

First, I realized I focused too much on relating “culturally relevant teaching (CRT) practices” to classroom experiences. For example, I encouraged the students to attend an Environmental Protection Agency meeting where they became aware of environmental toxins in the community. While these experiences were worthwhile, I came to realize that these experiences were disassociated from teaching practice. The culturally relevant experiences, which related to students being more aware of how science connects to the community, lacked modeling strategies and ways to teach teacher candidates how to use similar experiences in their own classrooms. When I met with Yasmine, I told her about the ideas I had to teach CRT and /or attend the EPA events to broaden student candidates' perspectives. We discussed them in turn, but Yasmine told me the various events and approaches did not have a clear foundation.

There was a bigger issue that was less discussed: the use of Spanish language in instruction. We learned most teacher candidates struggled, just as I did, with fluency and even shame when speaking Spanish out loud and imperfectly. Two key challenges that surfaced multiple times in the reflections were how to integrate language effectively in the class and finding student voice. As we met, this issue came up repeatedly when we reflected on teaching and re-reflected on previous classes.

In addition, I learned we can radically change the way Spanish is perceived with simple but effective changes to the classroom dialogue. First, providing opportunities for students to speak

and practice Spanish in class with bilingual science instruments, or even providing directions in both Spanish and English for assignments, could alter the way teacher candidates view Spanish in everyday use. This idea could also change the way that Spanish is perceived—as a marginalized language—by teacher candidates. I wanted to help teacher candidates gain pride and confidence in their native language and understand how their linguistic capital could support science learning. I also wanted to make the art of speaking of Spanish and English more equitable. In our discussions, we talked about different strategies that could work where Spanish was integrated in the classroom. I ran these ideas by Yasmine, and we decided to model Spanish in class.

I learned that if we model the use of Spanish with imperfections and gradually integrate it into instruction, then teacher candidates could utilize the same instructional practices in their own classrooms. One strategy we used was to collectively translate the name of science instruments from English to Spanish, which could then be transferred to trifolds and used for science demonstrations. To model the process, we translated the science instruments, and everyone in the class saw the translations on the projector screen. As we collectively engaged in this activity, we all made mistakes and helped each other figure out the correct translations. I too actively participated in the activity, and I did not know the exact translations of tools. Later, I provided printed copies of the science instruments in Spanish and English with pictures of the science instruments. Students copied and pasted the science instruments on the trifolds, so they could refer to the science instruments with their English and Spanish names as they conducted their demonstrations.

This was a good pedagogical tool students used with the trifolds. We both decided it should be incorporated because it could help student candidates practice Spanish if they were not fluent and engage with participants in the demonstrations in more depth if they were fluent in Spanish. This strategy was the one Yasmine thought would be most beneficial to student candidates because they would remember the printed pictures and words. In our meetings, Yasmine and I discussed the demonstrations that student candidates practiced in class (because the demonstrations occurred over the course of several weeks and incorporated different science concepts), and we discussed whether or not the English and Spanish names were being used and how, so it became a part of the weekly reflection discussions.

Yasmine mentioned another salient point that proved to be a critical juncture in our learning: fluent Spanish speakers still did not have a voice in the classroom. Yasmine served as a liaison between me and the teacher candidates in the class. She told me about one specific fluent Spanish-speaking teacher candidate and asked her questions about her use of Spanish in our classroom. In this excerpt below from my weekly reflections, I explain how Yasmine asked the bilingual teacher candidate why she did not speak Spanish in the class:

We both agree that we learned a lot this week especially on Wednesday when we translated the names of science tools/instruments from English to Spanish tools. Yasmine also stated she reached out to the Spanish-speaking student to ask if she felt comfortable speaking in class and she said she did not feel comfortable because perhaps the teacher would not understand her. We discussed this issue and decided that perhaps translating directions to assignments would be a good

way to speak in Spanish and make the student feel more comfortable. We both agreed that the science and math tool translations were a good steppingstone. Students would now feel more comfortable hearing me speak in Spanish. We both agreed that I would type the directions in Spanish and read it. We discussed the idea that even if I have an accent and I am not perfect the students would understand that there is vulnerability in that translation and that mistakes can be made so that we can practice Spanish and become more fluent. We also discussed the need for an explanation to students in the class about why translations in Spanish and English are important. We want students in the class to understand this is modeling (this is something that they could do in their classrooms in the future) for children to feel more comfortable that are only native Spanish speakers or learning to speak/retain Spanish. (Excerpt from a summary from the week of September 18th)

Through this partnership work, Yasmine found her voice. She analyzed who had power in the classroom and who did not. We decided if this teacher candidate did not feel comfortable speaking Spanish because she was afraid the teacher would not understand her, we needed to offer stepping stones for me and the other teacher candidates who were not fluent in Spanish. As a result of this, we understood the problem with more depth. As Cook-Sather (2020) explains, students can draw on their experience to advocate for more equitable practices. Students can also analyze and understand power dynamics within the classroom. Yasmine did both of these in our partnership.

This was a turning point in my understanding of Spanish practice in our classroom and in the conversation with Yasmine. We decided to change my teaching practice. We decided it is particularly important for students to be vulnerable and make mistakes and that I needed to be willing to share my own mistakes. Hopefully, this would make teacher candidates more willing to use Spanish in their science demonstrations (ie.g., showing the STEM tools in both languages, translating basic questions in Spanish, using Spanish for the science concept explanation, graphs).

Voice was a central theme for us in another way. Student teachers are rarely asked about their life experiences, their philosophy, and how they would like to use Spanish as a language in the classroom. If teachers can become more involved in the classroom use of Spanish, it can situate student teachers as a part of the conversation rather than something that is done to them. I learned my call to action was listening to student voice. I can better listen to student voice, learn what the needs of teacher candidates are, and better understand what culturally specific teaching practice is to them. As I plan for the future, I know critical conversations must happen at the start of the semester. This may help to uncover equity issues and prioritize Spanish linguistic capital. We need to consider whether “partnership projects might contribute to equity and justice” and how such projects can contribute to “positive personal experiences for student partners from equity-seeking groups”; “involving these students can draw attention to equity issues that may not have otherwise been prioritized” (de Bie et al., 2021, p. 99).

Conclusions: Yasmine and Puneet

The partnership we created with the support of BranchED was significant because it made us confront the complicated challenges, insights, and understanding we brought into the classroom. McHatton et al. (2013) state that “the lack of attention to structures within which teacher educators can discuss, dialogue, and debrief our experiences within higher education hinders our ability to learn from and refine our practice” (p. 12). This was something Puneet challenged herself to interrogate: Is changing the syllabus and my practices in class enough? How can I redress these harms in ways that take everyday interactions with student teachers into account? What other inequities exist in my classroom?

As we plan for the future, we hope to keep the relationship that has come from this partnership and to follow through with the ideas we had for improving the student experience, including engaging teacher candidates in more conversations after STEM events. Now that we have experienced the process, we are excited for the opportunity to conduct more research into these issues. The pedagogical partnership has encouraged us as budding and experienced researchers and learners of Spanish, and it acted as a place of transformation for our classroom teaching practices. We are hopeful these future projects will guide us to continue this partnership in different ways and increase the use of bilingual language and culturally appropriate instruction in the classes we serve.

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