Enhancing Academic Engagement of English Language Learners through Meaningful Communication Experiences in an after school Science, Art, and Language Club

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Abstract

The question of how to help English language learners (ELLs) engage more in learning is central to the success of education in Maryland, and across the United States. Hispanic ELLs generally have lower levels of academic success than their native English speaking peers. I created the Science, Art, and Language after school club to identify and provide alternative learning experiences that will promote and enhance student engagement for hispanic ELLs. Ten fifth grade hispanic ELLs participated in this interdisciplinary approach that included technology, hands-on science, raising butterflies, communicating and sharing videos with Spanish-speaking students in Mexico and Paraguay, and student reflection on learning. I used a mixed methods approach of teacher rating scales of student engagement, teacher anecdotal observations, and surveys of student reflection surveys to measure the success of the club. Reflection with colleagues at Para La Tierra (PLT) in Paraguay informed the direction of the club from inception to completion. Findings suggest that student engagement is enhanced in a learning environment that: focuses on meaningful communication within the group and with students in other countries, values students' culture and language, and encourages student reflection to drive activities. Sharing findings on student engagement and emergence of competencies in the club environment with students' classroom teachers has the potential to change teacher concepts of ELL students' capacities for academic achievement.

Key terms: English language learners, academic success, engagement, ELLs in science, after-school programs

Introduction

Background

The question of how to help English language learners (ELLs) engage more in learning is central to the success of education in Maryland, and across the United States. In 2012, 9.1 percent of public school students in the United States were English language learners (U.S. Department of Education, 2014). In Montgomery County Public Schools (MCPS) in Maryland, 14% percent of students are ELLs, up 35% in just six years (MCPS, 2014). English language learners make up 44% of the student body at Viers Mill Elementary School (VMES) where I teach. Sixty one percent are hispanic, and 67% qualify for FARMS (free and reduced meals), a federal indicator of poverty. The ELL subgroup at my school underperforms all other subgroups, with the exception of Special Education (IEP), on county and state standardized tests (MCPS, 2015; Figure1). Given these statistics, it's not surprising that the high school graduation rate for ELLS in Maryland is 54 percent, lower than any other subgroup or minority group (ibid.).

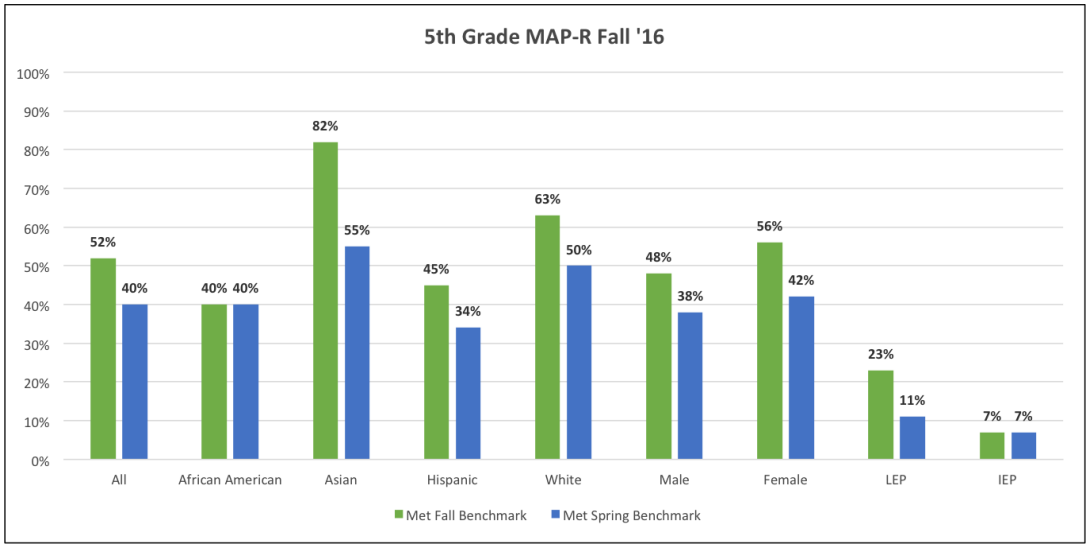

Figure 1: Maryland Assessment Program Reading (MAP-R) for Fifth Grade Students at VMES, 2016. Note: LEP (Limited English Proficient) includes ELL and second language learners who exited ESOL within the last 2 years.

How can we help ELL students succeed in school? One promising area is in the science classroom. Studies have established that engaging science activities, in particular, can boost success for English language learners (Lee, 2005; Chen, et. al. 2014). In fact, new research finds that integrating English literacy and oral language into hands-on science instruction is an

effective way to improve both English and science content knowledge (Haug, B., and Ødegaard, M., 2014). In recent years, however, elementary schools have cut back on the instructional time devoted to science content, decreasing student access to quality science programs (NSTA,). Lee (2005) found that nationally ELLs lag behind their native English-speaking peers in their mastery of science content. In MCPS, this gap has been identified by the middle school level in (MCPS, 2014), but most likely begins in elementary school, given the existence of large gaps in reading and math achievement.

The lack of meaningful science education for ELLs as part of the school day is at the forefront of current research and programming (NSTA, 2009; Lee, O., Quinn, H., & Valdés, G., 2013). The Next Generation Science Standards mandate a strong focus on increasing teachers' capacity to include ELLs in robust science instruction (Lee et al., 2013). Several groups of researchers have shown that professional development can promote positive changes in teacher beliefs and practices in integrating language and science (NSTA, 2009). Others have found that instructional interventions focused on culturally responsive teaching and guided inquiry, among others, show potential for narrowing the gap in achievement between ELLs and their peers, and enhancing science and literacy outcomes (ibid.). Still others suggest that we need more information on what teachers need to know (and do) in order to provide that support (Wilson, C. D., Taylor, J. A., Kowalski, S. M., & Carlson, J., 2010).

But as the data show us, ELLs cannot afford to wait for enhanced instruction; we have to act now to support our most vulnerable students (Bhattacharya, J., & Quiroga, J. 2011). As we train teachers and begin to implement ESOL (English to Speakers of Other Languages) best practices in daily science instruction, we can start to meet the needs of ELLs in a more immediate way. After-school science programs that build on students' interest in real world ideas and issues can help fill the gap for at risk populations of students (McNeir, G. & Wambalaba, J., 2006). We can directly target the needs of ELLs through practices proven to promote equity among learners in science, such as inquiry (Wilson et al., 2010), and encouraging the use of students' native language (bilingual support for English learning, citation). Overall, after-school programs are especially valuable sites for enhancing academic success in that they can offer creative approaches that recognize and build on ELLs

strengths to help them not only acquire English but also become empowered members of society (Bhattacharya, J., & Quiroga, J. 2011).

Creating an After-school Program

Creating an effective after-school program requires an understanding of the specific characteristics of teachers and students in the school setting (Bagby, J. H.; Ed., 2008). Because research suggests that teacher preparation and attitudes regarding students have a large bearing on ELL student success (Walker, A., Shafer, J., & Iiams, M., 2004), I wanted to understand the background and beliefs of the teachers with whom I work, with the goal of developing meaningful professional development regarding supporting ELLs in the content areas. On a national level, Walker et al. found that most classroom teachers have minimal training in adapting their curriculum and teaching practices to meet the needs of linguistically diverse students (2004). Moreover, negative attitudes regarding ELL students, and lack understanding of their specific needs and potential can reduce teacher effectiveness and undermine student success (ibid.).

In an attempt to better understand the interplay between classroom teachers' perceptions, teacher preparation, and ELL student achievement at my school, I surveyed 27 teachers, specialists and administrators in October, 2015, and September 2016 (Appendix A). The data showed that more teachers were confident in their ability to teach literacy (22), than ELLs (14). Even less teachers (10) were comfortable in teaching science, or integrating science and language learning (10). More teachers were "not comfortable" integrating science and language learning (9) than any other area. Given that 43% of the students in my school are ELLs, and significantly more are LEP, and that ELLs require extra support in science classroom (Gibbons, 2002; Vasquez, 2008), teachers clearly need additional training to meet students' needs. In fact, 79% expressed interest in professional development focused on integrating science and language learning.

Another significant finding from the survey was that a majority of teachers hold "lack of background experiences", and to a lesser degree, "lack of student effort" as major contributing factors to low achievement for ELLs. Interestly, poverty (though offered as a selection) was not considered to have a large impact, though close to 70% of our students live below the federal

poverty line. In any case, unlike teacher preparation, which is somewhat within a teacher's control, background experience and lack of effort lie outside of the perceived control of the teacher, suggesting that teachers may not feel a responsibility for their students' lack of achievement.

When I combined this finding with my observations of a consistent pattern of negative teacher talk ("he doesn't care", "she has no motivation", "he has no language", "she never talks", "they don't want to learn", etc.) at my school with respect to ELLs and academic achievement, I became convinced that we need to broaden our view of what English language learners are capable of doing, and to adjust our teaching practice to support them and enhance their academic success. Most teachers at my school care about the education of their students. The findings belie teachers' frustration with, and misunderstanding of, students who are learning in a nonnative language. Many ELL students bring rich and valuable background experiences that can be uncovered through "culturally responsive teaching" (Amaral, Garrison, & Klentschy, 2002). Also, looking to student poverty may have a bigger impact than teachers realize. Moreover, what is perceived as lack of motivation may be more accurately defined as lack of a site for engagement (Ellis, 2012). Language learning takes place through active engagement and repeated exposure to understandable language (ibid.) If we attribute student low achievement to factors outside of our control, we will fail to do justice to them as learners and as human beings (Amaral et al., 2002). It's our responsibility to help students fill in the gaps that exist due to different cultural and background experiences, and to expose the root causes for lack of motivation and engagement.

Overview of the Club and Research Focus

Thus, a goal of this project was to uncover some fundamental elements of instruction and learning that serve to engage ELLs. With this in mind, I created the after school Science, Art, and Language (SAL) club. Working in an alternative (after-school) environment allowed me the freedom to explore a variety of teaching and learning modalities without the constraints of having to deliver a prescribed curriculum. I used an interdisciplinary approach to science and language education including technology, hands-on science, raising butterflies, creating artwork, and communicating and sharing videos with Spanish-speaking students in Mexico and Paraguay.

The technology focus was built on my goal to produce student directed videos to share with colleagues and students I had met in Paraguay in the summer of 2016. In contemporary literacy learning, a shift is quickly taking place away from the print-based construction of knowledge to one based in "multimodal" forms of interaction, including video and other media (Sewell, W.C. & Denton, S. 2011). English language learners may have less access to technology outside of the classroom than some of their peers (citation), but their reality is mediated by technology at every turn. Thus, sharing videos with students in Paraguay, and sharing writing and artwork with students in Mexico through a Journey North project to connect students across the monarch butterfly migration routes, were both central to the project and supported a focus on meaningful student communication in their native language.

Building the club and integrating a variety of meaningful activities has been an ongoing process for at least a year. My connections with colleagues in Mexico, through the Journey North program, and my work as a consultant with the Monarch Sister Schools Program go back ten years, while my interaction with Para La Tierra (PLT), in Paraguay, began this past summer. I've continued to work with educators at PLT in developing the video sharing part of the project

My goal within the club was to create and implement engaging science-based activities, foster communication and oral language development and promote student reflection on their learning in a fun environment. My research goal was to determine which aspects (if any) of this multi-faceted approach were most effective in enhancing student engagement, and which were most valued by students. I used a mixed methods approach (Greene, 2007) of teacher rating scales of student engagement, teacher anecdotal observations, and surveys of student perceptions, informed by appreciative inquiry (Whitney, D. & Trosten-Bloom, A., 2010) to measure the success of the club. Specifically, I wanted to see how first language interaction and meaningful communication in creation and sharing of videos was a driver for student engagement. I also wanted to gauge student perceptions of self-confidence and self-worth, and assess increases in science content knowledge.

Based on a preliminary survey of club participants completed by eight students, fifty percent of the students stated that science was the thing they were best at, while 25% said drawing, and 25% math. Seven out of 8 students said they liked science a lot, while one was

neutral. All except one student said they like speaking Spanish a lot; one was neutral. Seventy five percent of students stated that they were comfortable writing in Spanish. I used these data to further support a focus on engaging science activities infused with art and supported in a bilingual environment.

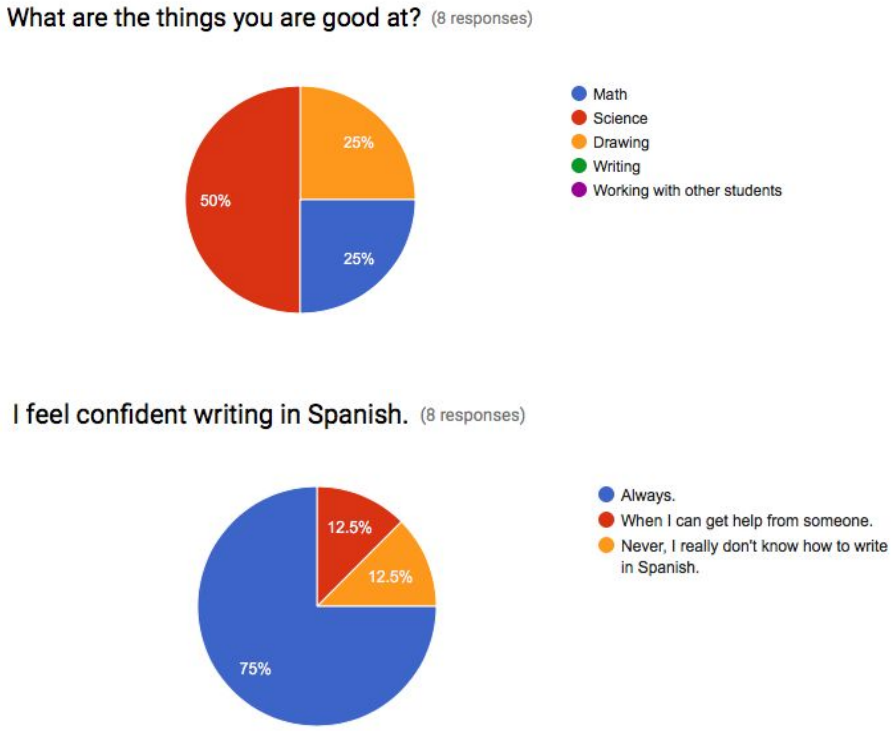

Figure 2: Student perceptions of learning used as a basis for creating a science-based, bilingual after-school club.

I developed the following three questions to guide my research:

1) Does student immersion in a bilingual learning environment built on meaningful communication enhance their engagement in learning?
2) Does the sharing of student created videos and letters with Spanish speaking students in Mexico and Paraguay help to create an environment of meaningful communication?
3) Does integrating artistic activities into science and language learning enhance student engagement in learning?

Based on my previous observations of students in authentic learning situations, I predicted that they will be more engaged when their native language is valued, and when they

have opportunities for artistic activities. I also believed that meaningful communication both within and between groups of students would result from making and sharing videos, and would enhance student engagement.

Methods

The Club

The SAL club met every Tuesday and Wednesday from October 2 to November 23, from 3:30 to 4:40 in my small classroom at Viers Mill Elementary School in Silver Spring, Maryland. Ten ELL students (from an original group of 15) formed the core of the group. Some students had another club on Tuesdays and Thursdays, so attended SAL only on Wednesday. Others came three days a week when I was able to host them on Thursdays as well. I tried to be very flexible in letting students who wanted to, be involved. The club was free and was by invitation. All of the invited students were LEP students, with Spanish as their first language. I wasn't compensated and I paid for all materials out of pocket (a total cost of less than $100) and used my own equipment (camera, video camera, and laptop computer and iPhone).

The first several weeks of club activities (Figure 3) revolved around rearing monarch caterpillars. Student teams were responsible for taking care of a pair of caterpillars; cleaning, feeding and documenting any changes in growth or behavior in their science journals. I encouraged them to ask questions, which we explored on the Monarch Watch and Journey North websites. Students also took photos and videos of the caterpillars, and each other, that we later shared with students in Mexico and Paraguay. Science content was important to the club, but was taught in the context of an active and communication-based environment. There were no tests, quizzes, or required completion of content tasks. I measured student success based on observations of their engagement in club activities, and responses to written surveys and oral questions.

Learning Area	Activity	Activity
Science	Exploring monarch life cycle and migration using Journey North website.	Rearing monarch caterpillars; growth and metabolism; Butterfly food and habitat needs in N.America and Mexico.
Language in Science	Science journals Asking questions; Making predictions;	Recording growth stages of the monarch; Sharing science knowledge with peers.
Communication	Reading about monarch behavior, science and migration (bilingual) Watching videos from students in Mexico	Writing letters in Spanish to students in Mexico. Interacting with members of SAL in Spanish/English
Technology/ Communication	Photographing caterpillars; Making videos; Watching videos from Paraguay Eco-club	Student Butterfly PowerPoint presentations; "What did you learn?" Activity
Art	3-D Monarch life cycle activity; Butterfly mandalas	Symbolic Migration: students created an artistic class butterfly to send to Mexico as part of Journey North's program
Geography/Culture	Exploring Google Earth: Mexico location VMES location.	Tracking the migration. What connects us? Activity: How far will they fly?

Figure 3: Activities in SAL Club Segment 1

The second half of the club (Figure 4) focused more directly on getting to know our partner Eco-club in Paraguay. Videos sent by educators at PLT focused on animals and nature, so we took our lead from them. We studied the area of Laguna Blanca, Paraguay through photos, videos and web-based information of the fauna, and some flora, found there. We added Paraguay to our student-made maps, and we compared the Paraguayan animals to those found in our local environment. SAL club students then wrote scripts in Spanish to use for another video. We created a 3D representation of the monarch life cycle using materials selected by students from my classroom supply of pipe cleaners, tissue paper, and the like. We watched 3 sets of videos created by the Paraguayan Eco-club students. Educators at PLT and I guided our reflections on the videos with the questions: how are we alike?; and how are we different? Sometimes conversations were in Spanish, at other times in English, and sometimes both. To promote English language development, sentence frames were sometimes used, for example: We are the

same/similar to students in Paraguay because _____. We are different than the students in Paraguay because _____.

Drawing on the work of de Vreede (de Vreede, C., Warner, A. & Pitter, R., 2014), the club encouraged collaboration and peer to peer support. As students demonstrated competencies, they were called upon by the teacher, and others, to share these with other students.

Learning Area	Activity	Activity
Science	Local animals Favorite animals Animals of Maryland	Researching animals; describing animals Exploring our schoolyard; Trees of VMES
Language in Science	Science journals, cont.	Writing video scripts
Communication	Bilingual interactions in SAL Asking and answering questions about videos: How are we alike? How are we different?	Using Spanish to communicate with students in Paraguay; Student presentations (English and Spanish) Student immigration stories.
Technology	Student photos around the school; Ecology computer games;	Student videos
Art	Tree poster; animal art Animal art	Student Map creation.
Geography/Culture	Explore Paraguay: Google Earth	Mapping activity: adding countries to the map.

Figure 4: Activities in SAL Club Segment 2

Study Design

I used both quantitative and qualitative data collection in a mixed methods approach to get the most information possible to evaluate the impact of the club on student engagement (Figure 4). This approach allows for observing patterns within a group, and also looking at individual differences (Johnson et al 2007). It suited my goal of seeking to identify common elements that enhance engagement, as well as looking at individual student preferences. The collection of qualitative data, such as my observations of student competencies, shed light on student growth and change in the study, independent of his/her language, ethnic, and cultural background, and to identify competencies that go beyond cultural norms. Alternatively,

quantitative data on the demographics of the group (Appendix B) were important in placing study participants in a cultural framework within the greater school community, particularly in that they all spoke English as a second language, and they all had relatively low levels of academic achievement in the traditional sense.

Data Collection Tools (Figure 5)

Teachers at Viers Mill ES were surveyed in October, 2015 and September, 2016 with respect to their attitudes regarding ELL achievement, confidence in their teaching, and interest in the topic of integrating science and language (Appendix A). This survey provided some context for my work, and allowed me to formulate my research questions with the goal of determining something useful to share with teachers. In other words, knowing the perceptions teachers have about ELLs' learning drove me to identify aspects of a learning environment that would enhance ELL engagement.

I administered three surveys directly to students (Appendix C). These surveys were taken online, one via Survey Monkey, and two using Google Forms. Students were motivated by the online survey format, which was colorful, included student-friendly rating scales (like filling in one to five stars), graphics and photos. Survey 1, Student Learning Reflection, was administered on October 2, 2016 to provide baseline data on student learning preferences, and attitudes about learning. Survey 2, What do you like about SAL?, was administered on October 30, 2016. Students shared how they felt about the club, what activities they liked, and what they would like to add. This survey was informed by appreciative inquiry -AI- (Odell, 2004) and allowed students to see positive change in an immediate time frame. As AI can guide participants in reflecting on the good in their worlds, and in determining how they can make things even better, I took from it some of the basic questions, What is the best of what we did today?; What does even better look like?; and How do we get there? (ibid.)

Mixed Methods Data Collection Tools				
Surveys	Viers Mill Teacher attitudes on student learning survey: September, 2016 (Appendix A)	Student Learning Reflection: October 2, 2016) (Appendix B)	Survey of Student Preferences: October 30,, 2016 (Appendix B)	Student Final Reflection Survey November 23, 2016 (Appendix B)
Teacher Rating Scales and Observations	Student Classroom Engagement: Social Studies (October, 2016)	Student club engagement (Multiple dates: October 2-Nov. 23)		
Teacher Observations	Student strengths and competencies in various club activities (October 2 to November 23)			

Figure 4. Mixed methods data collection tools used to evaluate which aspects of the Science, Art, and Language club were most effective, and most valued by students.

The third student survey was administered to nine students on November 23, 2016, and asked them to rate club activities and reflect on changes in themselves as learners. Additionally, they were asked to make suggestions for how the club could be improved.

I also rated students myself with respect to their engagement in the mainstream classroom, and in the after-school club. On 3 occasions I rated student engagement levels in their social studies classroom on a scale of 1-3. Social studies class was used because science instruction was spotty and varied significantly from classroom to classroom. Delivery of social studies was much more consistent so formed a better basis for assessing student engagement. I averaged the ratings and entered them into an Excel file (Appendix B). I also rated students on multiple occasions throughout the Club sessions on their engagement in club activities and entered averaged data into the same Excel file (see Figure 6).

Finally, combining data from student surveys with my observations of students while engaging in various club activities, I designated which activities were most valued by students. These I also entered into the Excel spreadsheet (Appendix B).

Study Group

The study group for this project was ten fifth grade English language learners in a suburban school district adjacent to Washington D.C. I know all of these students well, and either teach them now, or taught them in fourth grade. I see them all on a daily basis in the classroom, so was able to make educated comparisons between their behaviors in the club relative to the classroom. Their English language proficiency ranges from 3-6 on a scale of 1-6, measured using the Wisconsin Instructional Design Assessment (WIDA) which is the standard for all Maryland state schools, and many other states in the United States. If a student has a level a 6, it signifies that they have exited ESOL instruction, but they are still considered Reclassified English language learners, are still developing English language skills, and are part of the schools LEP subgroup (Figure 1). Club participants are all first language Spanish speakers with varying levels of English proficiency. Three of the students are completely literate in Spanish, meaning they read and write it at a level appropriate to their age and grade. These students completed schooling in Spanish in their country of origin before coming to the United States. The other seven students have had academic experiences only in English, with few opportunities to use their native language at school (see Appendix B).

All of the students in the study group have been assessed as "below grade level" in either reading or math, or both, based on their classroom performance. The students have low comprehension and proficiency in academic subjects such as social studies and science, based on first quarter report card data. They lag behind many of their native-English speaking peers in their ability to articulate and critically evaluate what they have learned in English.

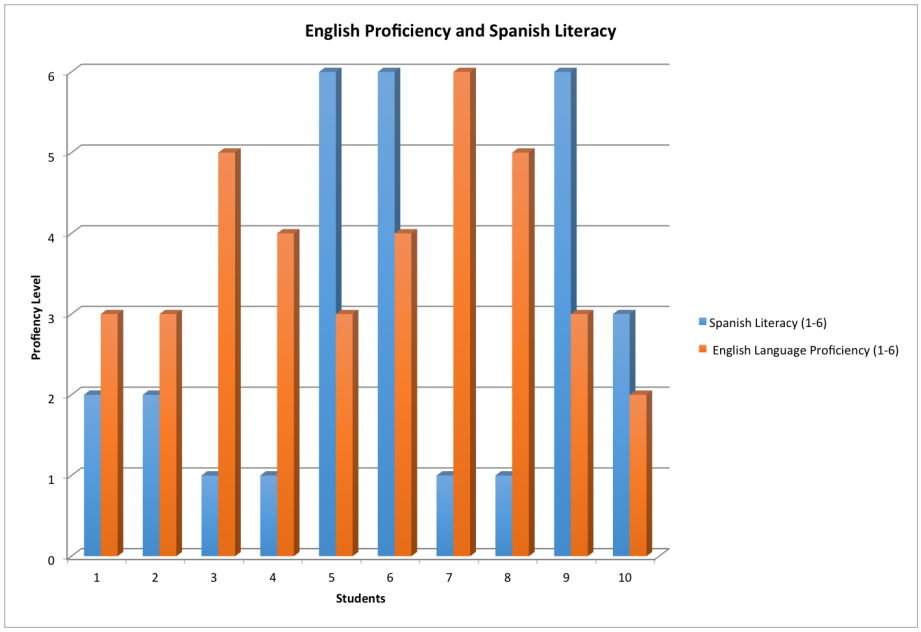

Figure 6: English Proficiency and Spanish Literacy of Club Participants

Results

Based on teacher observations of student engagement in classroom social studies instruction versus teacher observations of student engagement in club activities, students were more engaged when in the club environment (Figure 7).

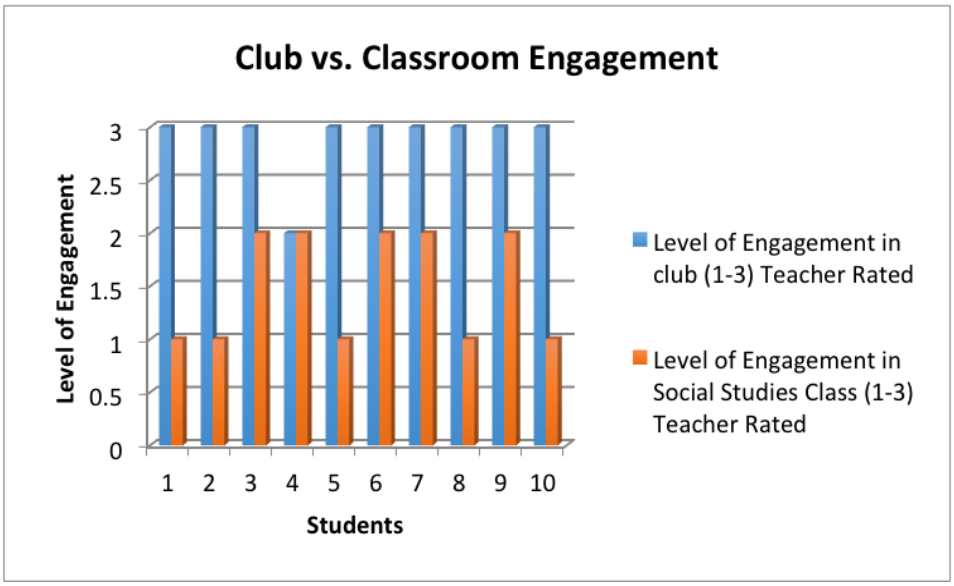

Figure 7: Comparison of Student Engagement in SAL Club vs. Social Studies Classroom based on teacher observation.

Data from Survey 1, Student Learning Reflection, showed that students feel they are good at science and enjoy science learning, and a majority feel confident writing in Spanish (Figure 2). They also rated drawing, and math as things they enjoy. They rated themselves high as readers as well, but their response to the question "How are your math skills?" was mixed. Three said their math skills were not very good, while 5 rated them good or great.

Survey 2, "What do you like about Science, Art, and Language Club?" (October 30), was administered about half way through the club session. It gave students another opportunity to reflect on their learning and voice their opinions. One hundred percent of students said they liked the club (a weighted average of 4.89/5.0). All club activities were liked by some students, with "Learning about butterflies" being selected the fewest number of times (3). Six out of nine students chose "taking photographs", "speaking and writing in Spanish", and "doing art projects" (Figure 8). "Making videos" was selected by 5 of the 9 students.

Answer Choices	Responses	
Learning about butterflies.	33.33%	3
Being with my friends.	44.44%	4
Taking photographs.	66.67%	6
Making videos.	55.56%	5
Sharing with kids in Mexico and Paraguay.	44.44%	4
Speaking and writing Spanish.	66.67%	6
Doing art projects.	66.67%	6
Total Respondents: 9		

Figure 8: Student Survey 2 (Oct. 30), Responses to Question 2: What activities do you like?

When asked what they would add to the club, 5 students said more science projects, 4 said more art projects, and 1 said more writing projects. In three out of six student written comments they said they wanted to take more pictures and use the cameras more.

Data from the third and final student survey (November 23) again showed that students liked the club (seven said it was "awesome"; Figure 9), and valued the club for many reasons: taking pictures, being with my friends, having something to do after school, learning about kids

from other countries, and taking videos (Figure 10). As the club went on, a trend could be seen in student preferences for making videos, and a continued affinity for taking pictures.

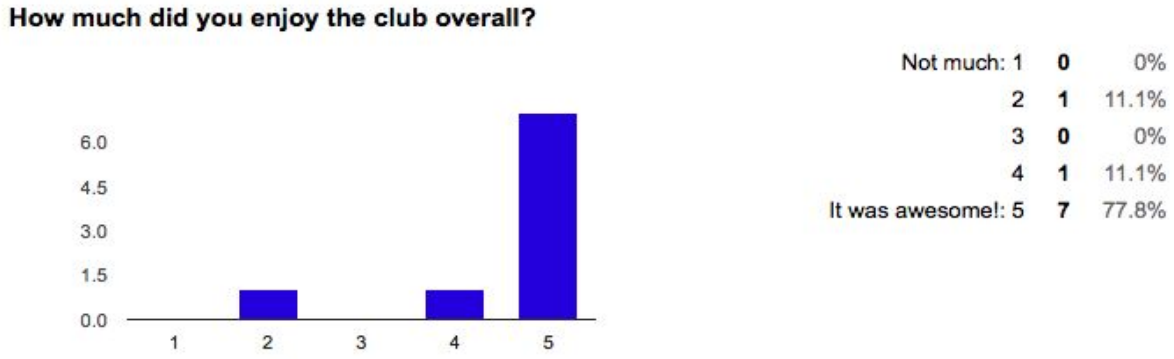

Figure 9: Final Survey Results - Club Reflection

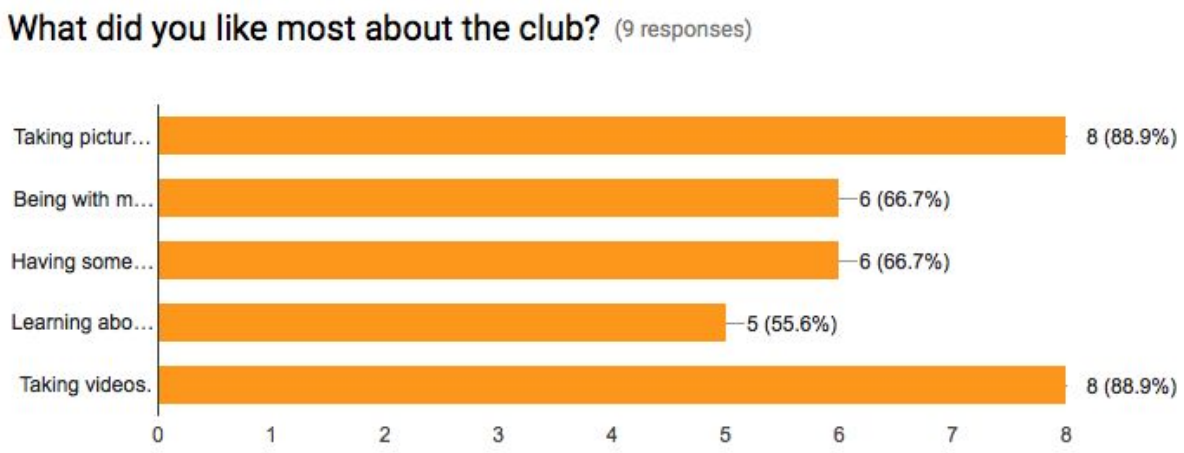

Figure 10: Final Student Survey Results - Activity Preferences

In addition, students reported gains in content knowledge (Figure 11), and expressed interest in learning more about all areas, but especially “taking pictures” and “making videos” (Figure 12).

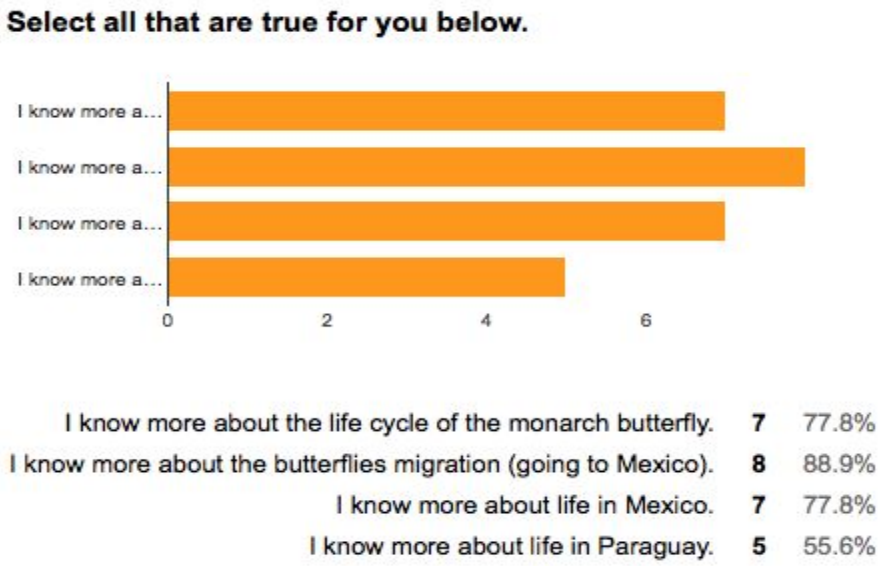

Figure 11: Final Student Survey Results - Content Knowledge.

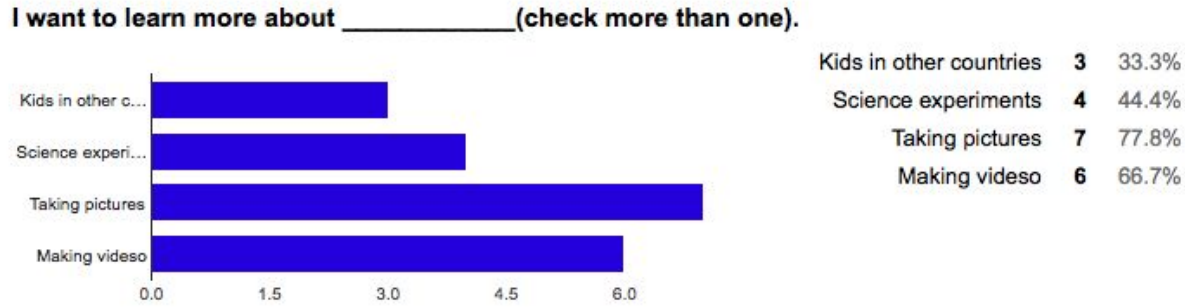

Figure 12: Final Student Survey Results - Future Learning

In an open-ended question students commented on what would make the club experience better. Assorted responses included: more time outside, more animals, more photography, more videos, more fun and exploring, and more snacks and drawing. Finally, students reported unanimously that they felt better about themselves at the end of the club session than they did at the beginning (Figure 13).

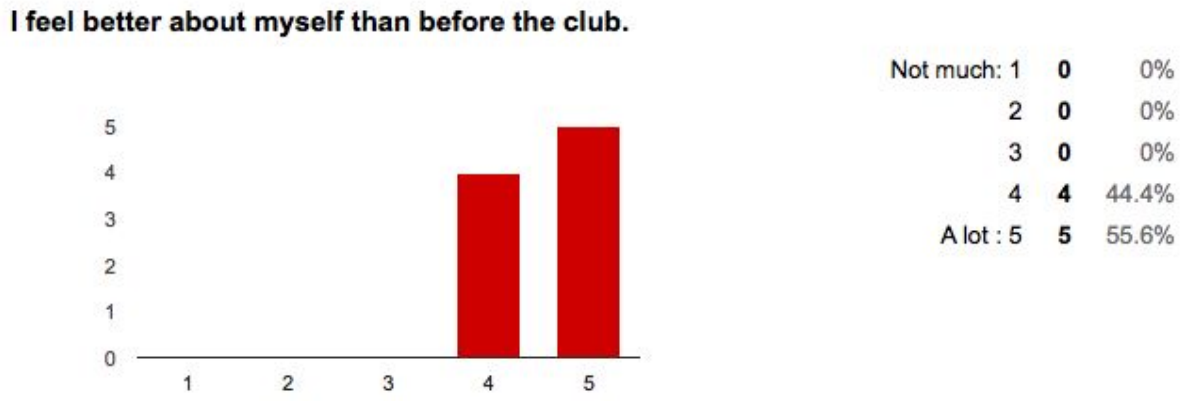

Figure 13: Final Student Survey Results - Self-Esteem

Students generated many artifacts throughout the club session. They recorded observations of monarch caterpillar life cycles in science journals, and created Google Slides and PowerPoint presentations about the life cycle of monarch butterflies. They wrote video scripts in Spanish, and created videos to share with students in Paraguay. Follow this link to view the first class video https://animoto.com/play/f1XDYqC11FPweZfxZuqDfQ. Students also wrote letters and drew pictures to share with students in Mexico as part of Journey North's Symbolic Butterfly migration (Journey North: https://www.learner.org/jnorth/sm/). If you follow this link, you should be able to find our butterfly (#6) on the map. We explored the school grounds and identified trees and collected leaves to use for an art project. The list goes on, and we lack the space here to show many samples of student work. Several student writing samples are included in Appendix D, as evidence of the use of both English and Spanish for student expression. Students' final video is still in post production, but should be completed soon. It will be shared with students in Paraguay, and hopefully will serve to continue the video sharing project there.

Discussion

A large amount of data were collected throughout the course of the Science, Art, and Language Club project. Much of the information will serve to create an even better club environment in the next session, which will run in spring of 2017. This discussion will focus on information that informs the research questions laid out at the beginning of this report.

1) Does student immersion in a bilingual learning environment built on meaningful communication enhance their engagement in learning?

Throughout the project, students engaged in meaningful communication with one another, with myself, and with peers in other countries and expressed themselves through writing, photography, and video production. Students were significantly more engaged in the club environment than in their social studies classrooms (Fig. 7). They appreciated working in groups with their friends and having the opportunity to "work hard" (as one student put it). In this case, I took "working hard" to mean being engaged. Club time was characterized by students working on a variety of different projects in a dynamic (sometimes noisy) environment.

Appreciative inquiry built a sense of power and agency by giving students the experience of personal and collective power (Whitney, 2010). Whitney suggests that asking individuals to focus on what is good in a given situation can also enhance self-esteem, self-expression and lead to transformation on organizational and personal levels (ibid). Students in the SAL club all expressed that they felt better about themselves than they did at the beginning of the club period, just 2 months before. This speaks to a kind of personal transformation. When I focus honestly on what the most transformative aspect of the club was, it seems to be in the fact that students felt valued and took ownership of the entire experience. Throughout the duration of the club, I gave students daily opportunities to talk about the club, and to give me feedback. Student knowledge that their opinions mattered empowered them to share more. As Cooperrider et al. have noted, these kinds of supported conversations focused on changing attitudes and behavior can promote appreciation of the good in situations (Cooperrider, D., Whitney, D. & Stavros, 2008). During the club sessions, I consistently pointed out when a student showed a particular competency, and encouraged them to share that in a collaborative way with their peers. Students got immediate feedback and recognition for their work, and left feeling better about themselves each day.

Student engagement was enhanced through meaningful communication throughout the sessions. English language learners conversed in Spanish and English about a variety of science topics, as well as geography, culture, personal reflections. Oral practice is fundamental to ELL science learning (Soto-Hinman, 2011, cited in Wilson, 2016) and was supported by the presence of a bilingual teacher, interesting topics, and use of technology resources such as Duolingo and

translation programs. Researchers such as Janzen (2008) suggest using a student's first language to support learning in content areas such as science. The club environment succeeded in offering this support. While I didn't measure language acquisition in English or Spanish, I believe students acquired language skills in both areas. Students did report increases in content knowledge in all topics covered in the club (Figure 11). Student video presentations strongly suggest expanded language capacity as well.

2) Does the sharing of student created videos and letters with Spanish speaking students in Mexico and Paraguay help to create an environment of meaningful communication?

Building communication around authentic activities, namely sharing information through videos with students in other parts of the world, definitely created an engaging platform for enhancing learning. In Surveys 2 and 3, nearly all students said they wanted to spend more time making videos. Though they rated "learning about kids in other countries" somewhat lower, the fact that these students were part of our project, compelled them to want to make videos. When students made videos for the students in other countries, they were focused and engaged. When they practiced making videos of other chosen topics, the process was much less productive and dynamic. In the final survey, 5 of 8 students expressed that they valued learning about students in other countries. More research needs to be done, however, to determine if making videos of other meaningful topics would be just as engaging. Given the high interest in making more videos expressed by students, it's clear that using this medium to communicate with other students was a highlight of the club project, and served to enhance student engagement. Future applications are plentiful in this area.

Another positive element of the video sharing project that was obvious to me as a teacher, but perhaps less so to the students themselves, was that it allowed for a "culturally responsive" learning environment. The cultures of the students we interacted with were very similar to the background cultures of the students in the group. Highlighting the value of the cultures, and an appreciation for the environments of both Paraguay and Mexico served to honor the students' cultural backgrounds as well. Club participants who were recent immigrants could especially relate to the lives of the students with whom we interacted.

3) Does integrating artistic activities into science and language learning enhance student engagement in learning?

Student survey responses suggest a strong affinity for the integration of art into science and language learning. In the first survey, students reported that they were competent in art. In the second survey, 67% reported that "doing art projects" was an activity they liked. In the third survey, several students expressed in written comments that "drawing" (often coupled with something else: "drawing and exploring", "drawing at the smart board", "taking pictures and drawing") was what they liked best about the club. Other activities in the club drew on creativity and artistic expression as well. Students had a choice of various creative activities daily, and appreciated the access to these as well as the flexibility to choose. In future club settings, I would increase the focus on artistic observation in the context of science. But clearly, art one element of the club that enhanced student engagement.

Action and Reflection

Throughout the entire project timeline of the Science, Art and Language club, I actively engaged several communities: teachers at my school, students at my school, and educators and students at PLT in Paraguay. Moving forward, I will continue to focus on my school community, and to expand the international reach of this program. I want to create a digital space in which students can effectively share content with each other in a teacher mediated environment. This has been a goal of mine for a long time, and I'm only now realizing I have the capacity to make it happen. In addition to empowering my students, creating SAL gave me confidence in myself as a teacher, a researcher, and a leader in advocating for my students. Several areas of focus are outlined below. I will continue to build the SAL club at my school, possibly reaching out to other teachers who have too much time on their hands!

Teacher Professional Development

Studies have shown that for English language learners, discourse and prolonged inquiry, along with reading and writing about science, are especially beneficial in building both science knowledge and English literacy (Chen, H.-T., Wang, H.-H., Lin, H.-S., P. Lawrenz, F., & Hong, Z.-R. , 2014). The immersive nature of the after-school Science, Art, and Language club is a

working example of a prolonged inquiry. I'm already on my way to creating and implementing a school-based professional development for teachers that will highlight some aspects of learner engagement as seen in the club, and provide some specific points of entry for them to use similar strategies in the classroom.

Co-teaching opportunities

The collaboration and co-teaching model (Dove & Honigsfeld, 2010) provides an opportunity for ESOL specialists to model teaching in the classroom. It has great promise, but it requires commitment and time to do it well. Coming out of the professional development above, I hope to identify at least one fifth grade teacher who will enter into a robust model of co-teaching that can serve as demonstration of how we can support ELLs in the classroom when we harness the expertise of all teachers.

Access to Technology

English language learners live in the same world of digital content and social media as their peers, and are hungry to learn about that world. Many times during the club, I wanted to be able to just put the technology into the hands of my students and let them take off. We were limited in many respects: lack of cameras, video cameras and laptops, and lack of access to good free software, which was often blocked on my school network. Though grateful for what we do have, I plan to create a list of the most usable resources and write a grant to procure them. I'll start with MCPS grants to teachers, and the school PTA and move on from there. On my list: several iPads, a digital video camera, and a good compound microscope (possibly digital as well). I'll also reach out to the technology arm of my county to see what programs are available for easy student production and editing of videos.

Reflection with Paraguay Partners

I learned a lot about the difficulties in communicating consistently with individuals with less access to internet. I think there's potential to continue our project, though, and look forward to debriefing with my Paraguay partners at PLT (and one who is not back in the United States) soon.

TESOL Poster

Finally, I intend to prepare a poster session for the upcoming TESOL (Teaching English to Speakers of Other Languages) conference to be held in May, 2017. The poster will represent the work of the SAL club and offer something to the discourse of teaching ELLs.

Conclusion

Student participation and reflection over the two months of the Science, Art, and Language club supported my prediction that student engagement can be increased through activities and pedagogy that empower children to participate in their own learning. Background experience is typically viewed from a deficit perspective, thus favoring those who can more easily make connections between personal experience and school learning (Jones, C., Sloss, T., & Wallace, J., 2014). However, experience is not static. Students are always learning new things, and making connections.This club experience showed that knowledge and experience to support academic learning can be gained in an after-school club environment, and potentially applied to classroom learning. Through sharing the successes of students in the club with other teachers in my building, I was able to begin to paint a more three dimensional picture of ELLs as learners, highlighting strengths that don't normally come to light in the classroom. Moreover, I showed that environments that enhance student to student communication and allow students to use their native language proved to uncover and highlight students' competencies in a variety of areas not typically seen in a traditional setting. Hopefully, further work in this area, along with targeted professional development on science and language learning (Lucas, T., Villegas, A. M., & Freedson-Gonzalez, M., 2008) will fuel a shift in teacher perceptions of what experiences are valuable, enhance teachers' ability to support student learning in science and language, and broaden the base for student connection. When we set our students up for small successes, self-esteem improves, engagement is enhanced, silence will be broken, and all students will have a voice. When the voices of more ELL students are heard in the mainstream classroom, teachers will have no choice but to broaden their teaching repertoire to meet the needs of all learners. I hope that my work will serve to help others reach that goal.

Acknowledgements

I'd like to thank Karen Clarke, Joe Sarvary, Karina Atkinson, and Jorge Ayala, all educators at Para La Tierra (PLT) in Paraguay for their support and participation in this project. Joe and Karina welcomed my project proposal with open arms, and walked me through the first phases of it. Joe and Jorge created the first video shared with my students in Maryland. Karen and Jorge stayed with me for the duration, providing many other videos and creating a context for reflecting on the project. Karen guided me through my work with an appreciative inquiry that always served to bring me back to what is most meaningful and valuable. Thanks to all of you. I look forward to continued work together.

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Appendix A

Survey of Teachers and Staff

Note: This is a link to the online survey. https://www.surveymonkey.com/r/GKG6KQK

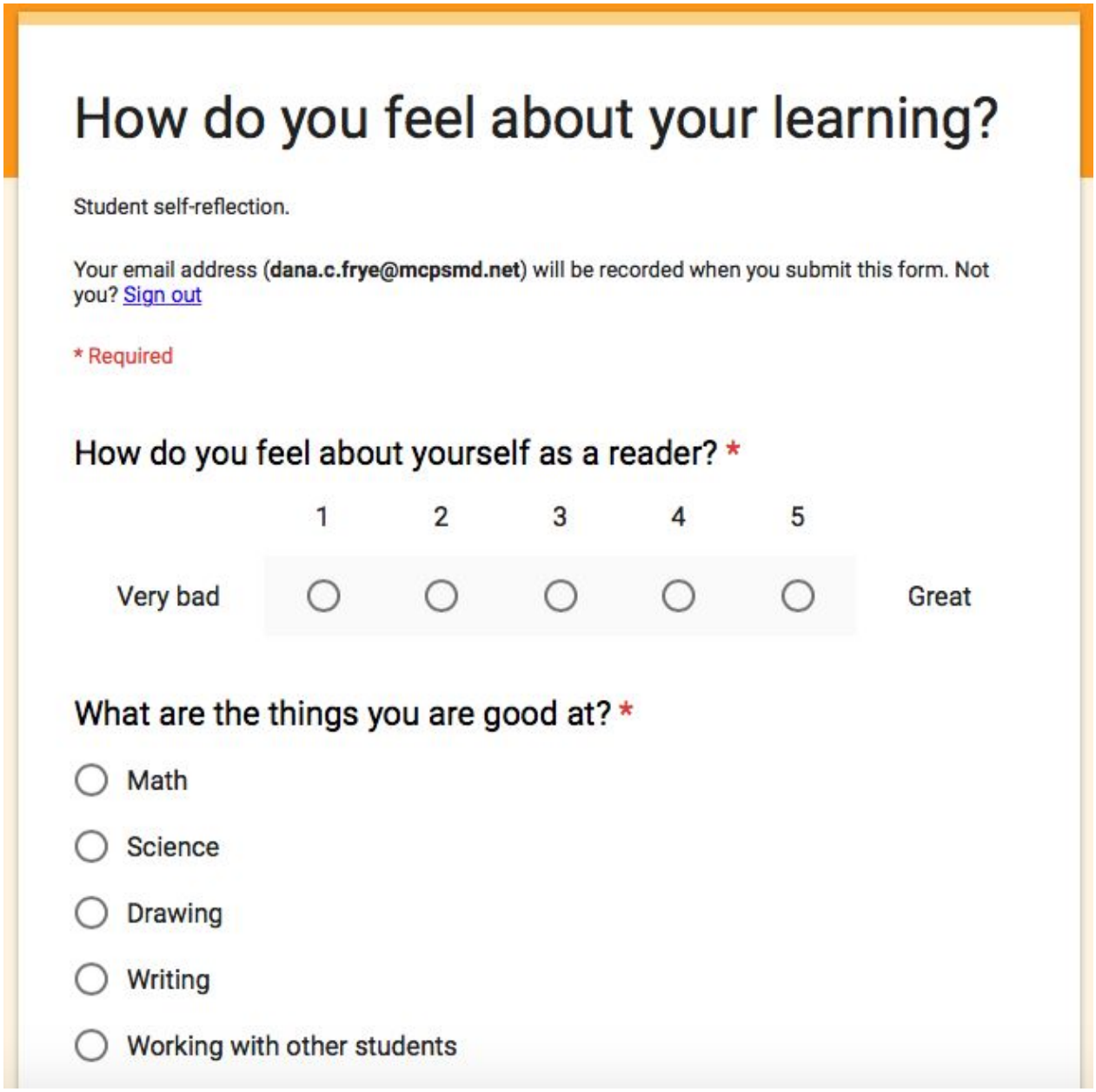
Appendix B

Excel spreadsheet of student demographic data, teacher rating scales of student engagement, and list of student preferences based on student choice of activities in club.

Name of Child	Born in US	Time in US if not from US	Country of Background	Spanish Literacy (1-6)	English Language Proficiency (1-6)	Level of Engagement in club (1-3) Teacher Rated	Level of Engagement in Social Studies Class (1-3) Teacher Rated	Club Engagement: A=Art; I=international interaction; S=Spanish literacy; Sc=Science; T=technology; V=phot0/video;
Crystal	no	3	Mexico	2	3	3	1	A I V S
Elizabeth	yes		US	2	3	3	1	I T V Sc
Gabriela	yes		US	1	5	3	2	A I T V
Michelle	yes		US	1	4	2	2	I T V Sc
Rafael	no	1	El Salvador	6	3	3	1	A I T V S
Rocio	no	2	El Salvador	6	4	3	2	A I T V S
Stefani	yes		US	1	6	3	2	A T Sc
Yesleeyn	no	4	El Salvador	1	5	3	1	I S T V
Jose	no	1	Honduras	6	3	3	2	A I T V Sc
Cristian	no	1	Honduras	3	2	3	1	I T V Sc

Appendix C Student Surveys

Survey 1: Student Learning Reflection: Administered October 2, 2016



How do you feel about your learning?

Student self-reflection.

Your email address (**dana.c.frye@mcpsmd.net**) will be recorded when you submit this form. Not you? Sign out

* Required

How do you feel about yourself as a reader? *

	1	2	3	4	5	
Very bad	○	○	○	○	○	Great

What are the things you are good at? *

- ○ Math
- ○ Science
- ○ Drawing
- ○ Writing
- ○ Working with other students

I like science. *

	1	2	3	4	5	
Not at all	○	○	○	○	○	A lot!

I like speaking in Spanish. *

	1	2	3	4	5	
Not at all	○	○	○	○	○	A lot

I feel confident writing in Spanish. *

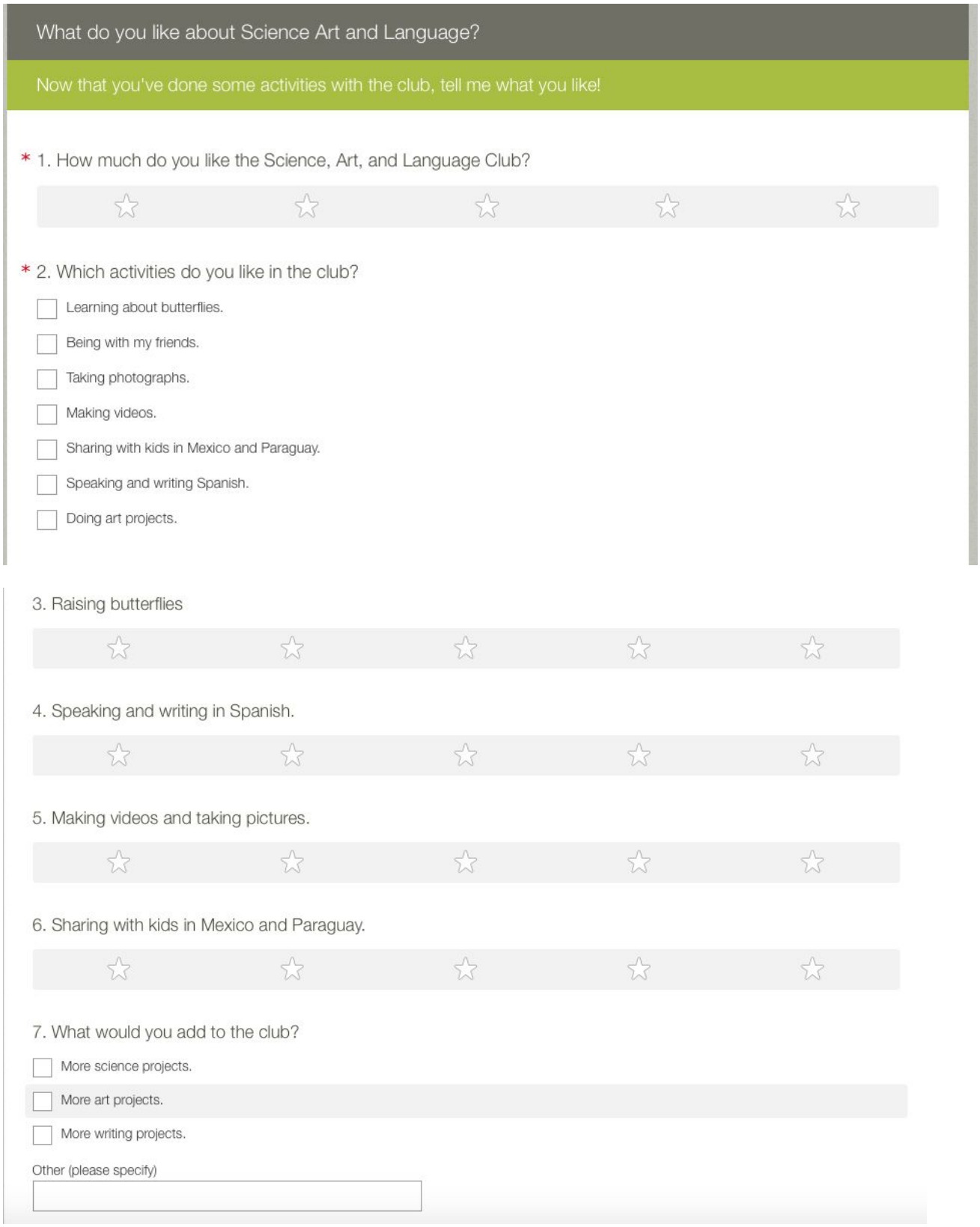
Choose

How are your math skills? *

	1	2	3	4	5	
Not good at all	○	○	○	○	○	Great

Student Learning Reflection

Student Survey 2: What do you like about SAL? (October 30- Nov. 2, 2016)



What do you like about Science Art and Language?

Now that you've done some activities with the club, tell me what you like!

* 1. How much do you like the Science, Art, and Language Club?

* 2. Which activities do you like in the club?

- [ ] Learning about butterflies.
- [ ] Being with my friends.
- [ ] Taking photographs.
- [ ] Making videos.
- [ ] Sharing with kids in Mexico and Paraguay.
- [ ] Speaking and writing Spanish.
- [ ] Doing art projects.

3. Raising butterflies

4. Speaking and writing in Spanish.

5. Making videos and taking pictures.

6. Sharing with kids in Mexico and Paraguay.

7. What would you add to the club?

- [ ] More science projects.
- [ ] More art projects.
- [ ] More writing projects.

Other (please specify)

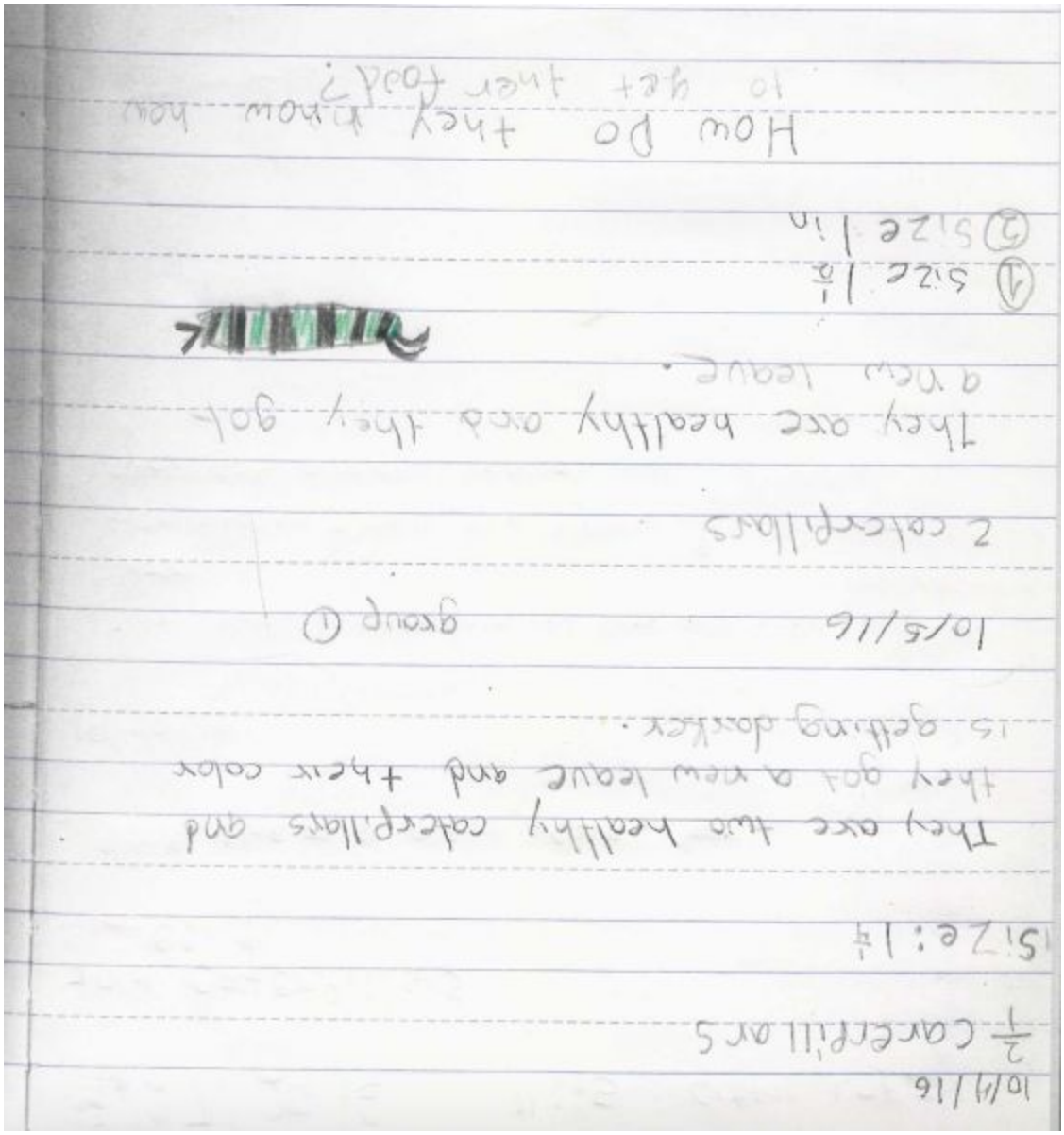
Survey 3: SAL Club Final Reflection

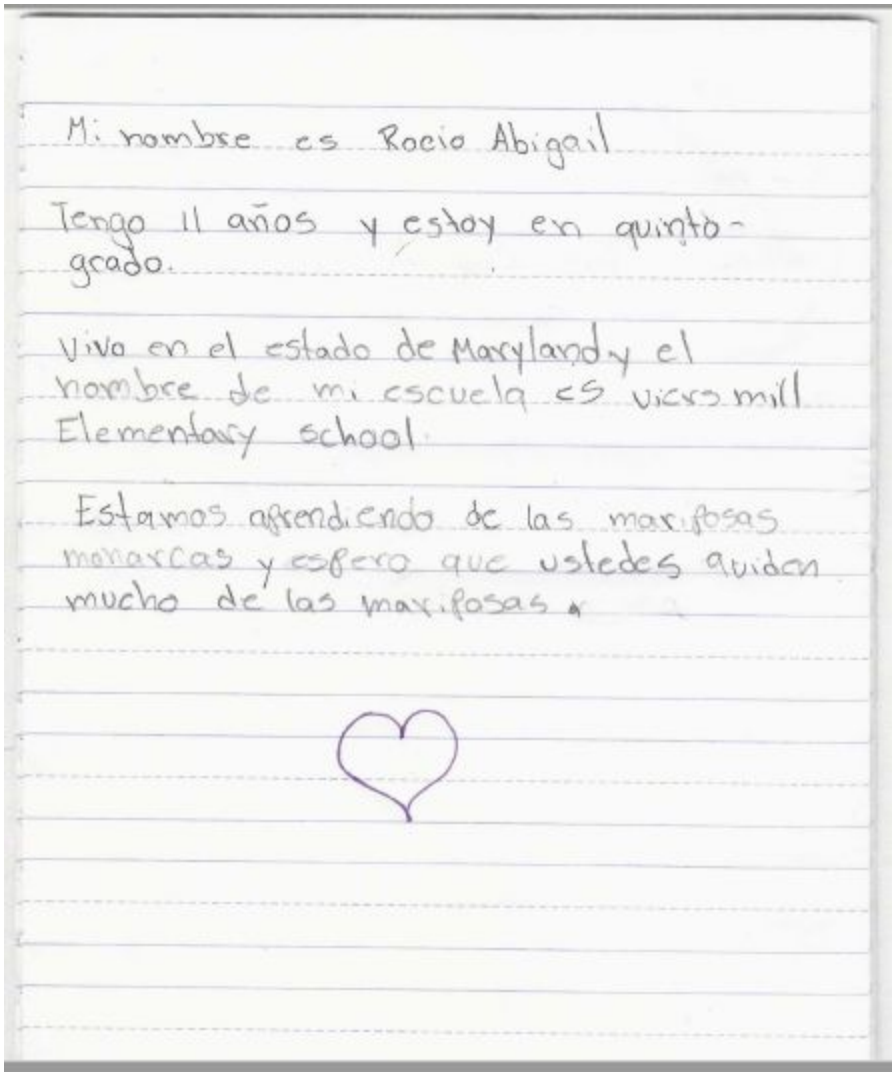
Note: This link will take you to the student version of the survey.

https://docs.google.com/a/mcpsmd.net/forms/d/15oyAZn4PxpWjkvCWj7ayUFO9jp-hjHu_j6iKQIrlKUM/prefill

Appendix D

Student writing samples in English and Spanish.





Mi nombre es Rocio Abigail

Tengo 11 años y estoy en quinto-grado.

Vivo en el estado de Maryland y el nombre de mi escuela es vicks mill Elementary school

Estamos afrendiendo de las maxifosas monarcas y espero que ustedes aviden mucho de las maxifosas.