Introduction

Recent initiatives in teacher education, encouraged by implementation of Common Core Standards and revisions of requirements for teachers working in linguistically diverse environments, have been eagerly pushing for a central role for language sensitivity in academically demanding educational practices (Zwiers, O’Hara, & Pritchard, 2014). In particular, teachers that work with English learners have a unique task to include these learners in mainstream academic work, while supporting these students to become successful in school.

In spite of these efforts, historically, instructional practices aimed at teaching English as an additional or new language in secondary public schools are often marked by the existence of self-contained or special courses on English language development and basic literacy skills, on one side, and other content-area courses, such as history, mathematics, and science, on the other side (Valdés, 2001). This separation gives the impression that language development happens independently from content and social contexts (Kern, 2000). In view of that, language learn-
Interdisciplinary Project Design

Issues in Teacher Education

ers are regularly deprived of engaging with using English for academic purposes in meaningful and authentic contexts of use for a long period of their schooling (Durán, 2008; Janzen, 2008).

In contrast to the more conventional contexts and classes English learners are usually exposed to, project-based learning emphasizes genuine and meaningful communication among students as a way to achieve common goals as well as problem solve in the development of a project. In integrating projects into their content classes, K-12 teachers can provide rich and vibrant learning environments and tasks that demand active student involvement while fostering language learning and engagement in higher-level thinking skills (Stoller, 2002).

Following this idea, the goal of this study is to investigate ways in which pre-service teachers in the areas of science, mathematics, social sciences, world languages, and English language arts collaborated to design interdisciplinary projects to ensure that English language learners in public schools are able to both access content and actively participate in the higher-level thinking activities required for the accomplishment of these projects. To achieve its goals, the study examines: (1) the outcomes of pre-service teachers’ collaborative efforts to design projects that support and challenge linguistically diverse groups of students, (2) pre-service teachers' perceived challenges, and (3) pre-service teachers' perceived successes of this collaborative and interdisciplinary work.

Project Design and Support for English Learners

Usually, projects entail a series of steps of collaborative and joint work, leading to an outcome. Rooted in a constructivist tradition, proponents of project work, design, or project-based learning advocate for a learning environment that engages students in experiencing and thinking about the world. Ideally, projects immerse students in doing, in getting their hands “dirty,” and in making them critically reflect on social and natural phenomena. According to Stoller (2002), the basic characteristics of projects are:

- Based on real-world content learning (thematic)
- Student-centered
- Cooperative rather than competitive
- Real-life tasks, integrating listening, reading, writing, and speaking skills
- Focused on process, culminating in an end product or outcome
- Ongoing, employing authentic assessment

Issues in Teacher Education
• Potentially empowering, usually resulting in building students’ confidence and autonomy

To design a project, teachers and students need to first think of a topic or question that is both relevant to the real world and to students’ lives, and from there think of an outcome or product that relates to the topic or question. For example, in designing a project about healthy food and life, a teacher may ask students to write an article for a magazine or newspaper. To do that, students create questions for an interview that they can conduct with members of their community about food and health habits. Once students have interviewed community members, they can analyze their responses or data in groups, and come up with some results for what kinds of foods community members eat, what they do to keep healthy, and other relevant habits they might have relating to food and health. In looking at the results, students can examine and critically reflect about the eating and exercising habits of their community. Students can then publish their results in the form of a magazine or newspaper they can distribute to their community members.

The idea of sharing and giving back to the community is a central aspect of projects that aim at connecting learning to students’ prior experiences, knowledge, and cultural background. This becomes even more important if English learners are included in the project. In particular, language learning theories that come from a socio-cultural perspective (Block, 2003; Lantolf, 1996; Lantolf & Pavlenko, 2001; Vygotsky, 1978) emphasize that an optimal learning environment is the one that allows learners to make connections and build bridges between what they already know and new content, ideas, and practices (Gibbons, 2015; Shatz & Wilkinson, 2013).

Besides tapping into prior knowledge, projects have the advantage of offering students, especially English learners, the opportunity to participate in activities that require them to speak, write, read, and listen for authentic purposes (Becket & Slater, 2005; Dooly & Masats, 2010). In addition, depending on what the outcome is (e.g., a documentary, a letter to the mayor, a video clip), students are also encouraged to use technological tools, such as word processors, video cameras, and video editing to design their projects. Finally, projects involve highly collaborative work, which is arguably one of the most important ways of promoting language use in the classroom if structured to maximize quality of speaking (Ellis & Shintani, 2014; Nunan, 2015; Soto, 2012).

A crucial aspect of projects that may be essential for supporting English learners in not only accessing academic content, but thinking and interacting with it, is the interdisciplinary nature of the tasks.
involved in designing, doing research, and engaging with knowledge for the completion of the project outcome (Miller, 2016). Recently, there has been a major push for teachers who work with English learners to learn how to integrate content in interdisciplinary units (Gibbons, 2015; Shatz & Wilkinson, 2013; Walter, 2004). With the right amount of support, lessons that integrate language, a variety of content, and context are able to afford teachers the opportunity to teach academic content and academic language while tapping into and respecting students' knowledge, home language, and diverse cultural backgrounds (Gibbons, 2015; Shatz & Wilkinson, 2013; Valdés, 2001).

In sum, in integrating skills, technology, collaborative groups, and hands-on tasks, projects have the potential to provide optimal scaffolds or supports for students who are learning English a new language.

Context of the Study

Bearing these principles in mind, over the course of three academic years (2011-2012, 2012-2013, 2013-2014), teacher candidates in the areas of history/social sciences, science, mathematics, world languages, and English language arts were required to collaborate to design a common project that would help bridge content-area instruction and English language development. Our course was denominated “ELD-SDAIE: Methods & Procedures” and was part of the secondary teacher candidate preliminary credential requirements in the state of California. Teacher candidates in this course were preparing to teach in highly linguistically diverse classrooms at the middle and/or high school level.

We facilitated the process of designing projects by providing careful step-by-step guidelines, materials, models, and by organizing teacher candidates in strategic grouping. As part of the scaffolds we provided for the teacher candidates to be able to design their interdisciplinary projects, we structured the course in the following way:

- **Day 1:**
  
  Teacher candidates were divided into interdisciplinary groups of 3-5 members. In each group, there needed to be two or more different disciplines represented.

  Candidates watched and analyzed model projects through videos showcasing interdisciplinary projects in public schools around the U.S. as well as through examples provided by instructors and former students.

  Candidates used the project design graphic organizer (see Table 1) to first analyze model projects and second plan and brainstorm for ideas for their own project. This graphic organizer was especially helpful in pushing candidates to include cultural relevant themes.
• Day 2:

Candidates used ideas brainstormed in the graphic organizer to create a block schedule, organizing the project step-by-step, day-by-day, week-by-week. Candidates also created a step-by-step outline for their projects as well as an interdisciplinary thematic unit visual representation, which showed how their different content areas intersected through one common theme.

<table>
<thead>
<tr>
<th>Focus</th>
<th>Questions</th>
<th>Notes, Comments, &amp; Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theme, Challenge or Problem</td>
<td>What is the main theme, challenge, or problem students are tackling? What is the interdisciplinary aspect of the project?</td>
<td></td>
</tr>
<tr>
<td>Final Outcome or Product</td>
<td>What is the final outcome or product students are working on? How is it connected to the real world and/or community? How is it going to be published and/or shared with others?</td>
<td></td>
</tr>
<tr>
<td>Tasks and Materials</td>
<td>How are materials and tasks organized and distributed in the project? Take into consideration the role of “scaffolds.”</td>
<td></td>
</tr>
<tr>
<td>Roles</td>
<td>What are the roles participants (students and teachers) have in the project? How are participants organized in the project?</td>
<td></td>
</tr>
<tr>
<td>Knowledge and Language</td>
<td>What knowledge and language do students need to become an active participant in the project?</td>
<td></td>
</tr>
<tr>
<td>Technological Tools</td>
<td>What is the role of technology in the lesson? What is the purpose for using technology?</td>
<td></td>
</tr>
<tr>
<td>Assessment and Grading</td>
<td>How are students being assessed and graded? What percentage does the project have in their final grade?</td>
<td></td>
</tr>
</tbody>
</table>
At this point, candidates were required to think carefully about which scaffolds they would provide English learners. Candidates needed to include scaffolds to (1) tap into students’ prior knowledge, (2) attend to cognitive load, (3) promote peer collaboration, and (4) cultivate metacognition and awareness. Candidates were encouraged to utilize technology as a way to provide scaffolds. For example, students could use iPads to help students take pictures or to assist students in creating models using different applications.

Candidates were required to identify language demands of the project by highlighting language functions and forms necessary for students to engage actively in the tasks and completion of the final outcome. This was especially relevant concerning the kinds of language supports English learners would need to be able to read, write, listen, and speak successfully. With this information, candidates designed a description of their final outcome and one SDAIE lesson within their project, adding English Language Development (ELD) Standards as well as Academic Language Functions, Forms, and Opportunities for Practice (Fluency).

• Day 3:

Candidates were required to make clear how they would assess and grade their students based on the project outcome and tasks.

Candidates assessed other groups’ projects by engaging in peer critique using the peer feedback form (see Appendix).

Candidates self-assessed their experience by answering to the survey questions in Table 2 (below).

Data Collection and Methodology

Once candidates had completed the work done in Days 1, 2 and 3, we had access to a number of relevant materials that could shed light onto their experience planning and collaborating to design an interdisciplinary project. As mentioned above, we collected materials for three consecutive academic years. Participants included 60 secondary teacher candidates in the areas of history/social science, mathematics, science, world languages, and English language arts.

Mainly, we were curious to find out what the candidates had produced as a result of their experiences as well as what they had to say about it. Thus, we decided to take a closer look at (1) what teacher candidates perceived as the main challenges and gains of the project, (2) what their visual representations, notes, and descriptions of the final outcomes looked like in terms of content, language, and technology, particularly the role of scaffolds, and (3) what specific group members as individuals said about their experiences in contrast to the whole class. The data...
that best addressed these inquiries were the 60 candidates’ responses to questions 1 and 2 in the survey, a sample of one of the projects, and answers to questions 1 and 2 given by the 5 members of the sample project we analyzed. The data was then analyzed as follows.

**Analysis 1:**

*Pre-Service Teachers’ Perceived Main Challenges and Gains*

The first step of the analysis was to code the 60 teacher candidate responses using an inductive approach based on coding principles used in qualitative research methodology (Saldana, 2009). We started with our own biases regarding the types of questions we asked as their instructors. Candidates’ responses were then analyzed and grouped for patterns that included similarity, frequency, and correspondence regarding what candidates thought were the main challenges and gains. The first main themes were extracted, re-evaluated or re-checked, and then clustered according to similarity for gains and purposes, that is ways in which participants mentioned the same or close to same choice and reasoning for listing a specific gain or purpose. Second, the themes were then grouped for correspondence, or ways in which similar or close to same themes happened in relation to each other as well as in relation to gains.

---

**Table 2**

*Self-Assessment of Project Work Survey*

This is a self-assessment tool to help you and the instructor reflect on the experience of working in groups with colleagues to design an interdisciplinary project. Your answers will help improve the course and your own practices regarding this kind of project work. Thank you!

1. Based on your experience working with your colleagues to design this project, what would you say was the biggest challenge?

2. Based on your experience working with your colleagues to design this project, what would you say was the biggest “gain”?*

3. In what ways do you think this kind of project can help you achieve your teaching goals?

4. If you were to implement this kind of project in your school, what suggestions/recommendations would you give to colleagues, students, and others involved?

5. Overall, how would you rate this experience as a student?

6. Overall, how would you rate this experience as a teacher?
and purposes. Table 3 (below) displays the categories that stemmed from this first step of analysis.

Once the main themes were extracted and grouped for similarity and correspondence, they were finally regrouped for frequency. The key for the themes can be found in Table 3 (below). The numbers of responses for challenges and gains are depicted in Figures 1 and 2.

**Discussion**

“Collaboration and sharing with peers” and “working across disciplines” were listed as the major gains of the project. For example:

> It was wonderful to hear the perspectives of individuals from different content areas. I felt that we were able to think of ideas we would not have been able to create on our own. This program has made me appreciate the importance and helpfulness of collaboration. (Teacher candidate in history/social sciences)

And

> It was pretty amazing working in interdisciplinary groups. The ideas that we all came up with together were amazing and makes me look forward to doing a project like this with teachers in other disciplines in the future. (Teacher candidate in English language arts)

<table>
<thead>
<tr>
<th>Challenges</th>
<th>Gains</th>
</tr>
</thead>
<tbody>
<tr>
<td>Understanding the project</td>
<td>Collaboration and sharing with peers</td>
</tr>
<tr>
<td>Coming up with ideas</td>
<td>Seeing ELs as cultural resources</td>
</tr>
<tr>
<td>Moving from ideas to designing</td>
<td>Exploring and learning new technologies</td>
</tr>
<tr>
<td>concrete tasks</td>
<td></td>
</tr>
<tr>
<td>Identifying language demands and</td>
<td>A sense of accomplishment</td>
</tr>
<tr>
<td>supports</td>
<td></td>
</tr>
<tr>
<td>Making project relevant and “real”</td>
<td>Bringing content to life</td>
</tr>
<tr>
<td>Implementing the project (logistics)</td>
<td>Understanding what assessments look like in group work</td>
</tr>
<tr>
<td>Working in groups</td>
<td>Language demands, supports and strategies for working with ELs</td>
</tr>
<tr>
<td>Integrating of different disciplines</td>
<td>Working across disciplines</td>
</tr>
</tbody>
</table>

**Table 3**

*Project Work Main Challenges and Gains*
In spite of the many advantages of collaboration pointed out by candidates, “working in groups” and “integration of different disciplines” were listed as the main challenges of the project. For instance:

The biggest challenge was finding a project that truly incorporated all of our subject matters. I feel as though that was extremely tough and

---

**Figure 1**
*Project Work—Main Challenges*

This chart displays the number of responses each theme received.

![Pie chart](image)

- understanding the project: 19
- coming up with ideas: 12
- moving from ideas to designing concrete tasks: 4
- identifying language demands and supports: 8
- making project relevant and “real”: 10

---

**Figure 2**
*Project Work—Main Gains*

This chart displays the number of responses each theme received.

![Pie chart](image)

- Collaboration and sharing with peers: 20
- Seeing ELs as cultural resources: 16
- Exploring and learning new technologies: 2
- A sense of accomplishment: 12
- Bringing content to life: 6
- Understanding what assessments look like in group work: 1

---

*Clara Vaz Bauler & Jennifer Scalzo*

Volume 25, Number 2, Fall 2016
wish more mathematics was able to be involved in the project. (Teacher candidate in mathematics)

And

Finding ways to include different subjects in the project and make sure the project represented each equally. Also, in the real world, coordinating between departments would be difficult because there is unlikely to be 100% overlap in class rosters and student schedules. (Teacher candidate in science)

When looking at the main challenges and main gains candidates elected, we could not help but wonder about this conundrum, and even contradiction. Candidates’ responses and perceptions indicated that the major challenges are also perceived as the major gains of project work. In other words, collaboration was often considered difficult; however, in spite of the complexities of group work, especially when it involved different disciplines, these candidates also felt that sharing and designing projects with peers was valuable. This finding might suggest that the challenges imposed by project work might be overcome and even appreciated if the objectives are perceived to be accomplished successfully.

Six out of 60 teacher candidates (10%) considered “language demands, supports, and strategies for working with English learners” as being the main gain of the project. Although this number might not seem highly significant, we were pleasantly surprised to notice that a few candidates mentioned supporting English learners as their main gain. This was indeed one of the main goals of our course. For example:

The biggest gain was thinking about how to provide support or scaffolding for ELL students during this project. It’s really valuable to keep these scaffolding options in mind (e.g., KWL, sentence frames, etc.). (Teacher candidate in science)

And

The biggest gain for me was incorporating the SDAIE strategies into the lesson plan. I’m not too familiar working with SDAIE students, so when I was forced to really think about it and make a SDAIE lesson plan, it really helped thinking about how I would use specific strategies in real lesson plans. I even learned that all of these strategies are valuable to all students. (Teacher candidate in science)

Four teacher candidates listed “identifying language demands and supports” as a main challenge. This finding might indicate that very few candidates considered identifying language demands and supports as being a main challenge. Providing language supports for English learners was not perceived as hindering or as being a problem for the design of
the project for the majority of the 60 teacher candidates involved in the study. Since one of our main objectives in implementing project work in teacher education was indeed to help teacher candidates include, support, and challenge English learners, we were also pleased with this finding and what it may represent for the professional development of teachers who work with English learners. Additionally, all of the projects included a variety of scaffolds (e.g., sentence frames, group work, visuals, hands-on materials, graphic organizers, etc.) in their design, as it is also amply demonstrated by our analysis of the sample project in this study in Analysis 2 (below).

While “seeing English learners as being cultural resources” and “bringing content to life” were mentioned by two candidates as being their main gain, “making the project real” was considered a main challenge by eight candidates. Though not highly significant, these candidates expressed a certain degree of struggle with the idea that an ideal project has to connect to students’ lives, interests, and the worlds they have access to. For example:

Our biggest challenge was making sure that English learners would not be left behind (to make sure they understood each task.) Also managing the project so that it wasn’t cognitive overload. (Teacher candidate in English language arts)

Seeing English learners as cultural resources was a point that we emphasized in the creation of the theme and outcome. We expected that this would be a challenge for our candidates, but believed that in pushing them to do so, creative ways to include English learners’ experiences, cultural backgrounds and communities would be at the center of candidates’ decisions. In fact, many projects addressed themes and problems related to diverse students’ lives or local issues by implementing the themes of “diversity” in nature and in literature, “water filtration and access” in Latin America, “farming,” and the controversy around the construction of a dam in one of the schools’ neighborhood.

Finally, a slightly significant number of candidates, 16 out of 60, or a little over 25%, mentioned that “implementing the project” or logistics, “moving from ideas to concrete tasks,” and “coming up with ideas” were a main challenge for them. For example:

The biggest challenge was breaking down the tasks. Once we figured that out, I felt that our group worked very well together. (Teacher candidate in history/social sciences)

And

I think that the biggest challenge was to come to find a topic and the
logistics of the project. Sometimes we would think of something and then trying to figure out how would it be done in Spanish or what the project (or us) may be implying to some of the students and their background. (Teacher candidate in world languages—Spanish)

This finding might indicate that teachers need to be provided ongoing support and opportunities to not only getting used to collaborate and share ideas, but also be strategic about length of project, times to co-teach and structure class periods, as well as organization of field work excursions.

**Analysis 2: Sample Interdisciplinary Project**

Across the three years we collected materials and samples of project work, the work teacher candidates produced never ceased to amaze us. Despite the candidates’ little experiences and limited exposure to teaching English learners, in all of the projects there was a genuine intent of combining interdisciplinary knowledge while building on a theme that was relevant to linguistically and culturally diverse students. It was very difficult to select one sample project for this study given that many projects were exceptional. In spite of that, we chose one sample, and the criteria used for this selection were: (1) a high number of different disciplines involved, (2) 100% teacher candidate participation in the self-assessment or survey (all members of the group responded to the survey), and (3) the quality of the scaffolds provided.

Once the sample project was selected, we examined it according to

<table>
<thead>
<tr>
<th>Table 4</th>
<th>Analysis Questions</th>
</tr>
</thead>
</table>
| (1) Content | • What content and disciplinary knowledge are included in the design of the project?  
• In what ways have the candidates integrated their different disciplines?  
• How do the content and choice of project relate to the needs of linguistically diverse populations of students? |
| (2) Language | • What are the language demands of this project? (The amount of listening, reading, writing, and speaking in the tasks involved in the project.)  
• What scaffolds are provided? |
| (3) Technology | • What technological tools are candidates employing? For what purpose? |

**Issues in Teacher Education**
content, language, and technology using the following questions displayed in Table 4.

**Discussion**

In investigating “The Landmark Project” for content, language, and technology, below is a visual representation (Figure 3) of ways in which teacher candidates included these three dimensions in their project design accompanied by the analysis of the pedagogical implications.

**Content:** All of the group members’ disciplines were represented and included in a challenging and meaningful way in the creation of the landmark. This was done by requiring that students add in geometrical measurements and a written narrative describing what the model was as well as historical or cultural significance to the actual model of the landmark. The description of the project could also be done in Spanish. With these tasks, the teacher candidates incorporated Engineering, Mathematics, Literacy, Spanish, and History in their project design. In allowing students to write in Spanish, or their home language, teacher candidates provided a space for linguistically diverse students to express
themselves, engage in higher-level thinking and writing, and develop literacy skills in their home language. That is an effective way to value the funds of knowledge students bring (Moll et al., 1992) while attending to the needs of the Spanish-speaking population of students in Southern California schools. Table 5 (below) summarizes the ways in which candidates weaved their disciplines into their project design.

**Language:** Speaking, writing, reading, and listening were integrated successfully and smoothly. In having students first create an actual model that can be manipulated and built in groups, teacher candidates provided the necessary supports for students to have something to talk and write about. The four parts of the project require that students talk with peers to create their landmark model, write about what the model is and its historical/cultural significant, and provide geometrical information about the model. Gibbons (2015) suggests that in having students engage in a hands-on experiment, especially with other peers, first, not last, as it is traditionally done, allows for students to use language that goes beyond their level of English proficiency. Nunan (2015) also suggests that in working in groups, students are forced to negotiate meaning, which pushes them to actively use language while thinking and learning new ways of using language. In this regard, “The Landmark Project” seems to be highly effective in promoting speaking and writing skills.

In addition, in brainstorming about the vocabulary demands of the project, candidates recognized the key words students would need to

<table>
<thead>
<tr>
<th>Theme or Challenge</th>
<th>Disciplines</th>
<th>Outcomes</th>
</tr>
</thead>
</table>
| “Create a model of a cultural landmark in present day, from the past or the future, based on your own family’s culture and history (using a Blueprint sketch, diorama, or Minecraft)” | English Language Arts (ELA), History/Social Science, and World Language—Spanish | • Written Narrative  
• Written Excerpt on Historical/Cultural Significance in English or Home Language (Spanish)  
• Landmark Model  
• Geometric Measurements |

*Full description of the project as well as other materials created or used by teacher candidates to plan, brainstorm and design the project are provided in full in the Appendix.*
be able to talk about the project, write their narrative and placard, and provide the geometric measures. This analysis revealed another dimension of the interdisciplinary nature of this project, involving words and concepts from a variety of subjects and fields. See Figure 4 for a list of key academic vocabulary included in the project tasks. Especially for academic language development, this essential part of the project design is extremely helpful for teachers and students to acquire a notion of what words to emphasize and learn. Below is a visual representation of the key vocabulary candidates would need to draw attention to and be particularly mindful of in the process of actively engaging students in creating the outcome and participating in the tasks required to design their landmark projects.

**Scaffolds:** A variety of scaffolds were provided for both academic vocabulary development as well as written and spoken use of language in “The Landmark Project.” Below, in Table 6, is a list of scaffolds provided by teacher candidates according to different needs and purposes.

To tap into students’ prior knowledge, candidates were really careful and thoughtful about their student population, mostly Spanish speakers. In allowing students to use their cultural traditions and home language, candidates provided their students with the opportunity to not only actively build on their experiences and “funds of knowledge” (Moll, Amanti, Neff, & Gonzalez, 1992), but also value their cultural heritage.

---

**Figure 4**

*Key Academic Vocabulary Required for Project Tasks*
and first language. Flor Ada & Campoy (2003) are keen at pointing out the importance of having linguistically diverse students celebrate and cultivate their cultural heritage and language to be able to foster confidence and a healthy relationship with their home and family communities. In placing an emphasis on the landmark being a symbol of culture and history, the design for “The Landmark Project” seems highly culturally-sensitive (Nieto, 1999).

Another important aspect of “The Landmark Project” is the option of designing a landmark that represents the future. This alternative allows students to create a completely new model, going beyond stereotypes and allowing creativity. In this sense, candidates were extremely sensitive to the fact that many students might not want to associate with any particular cultural tradition, taking into consideration fragmented identities and the complexities of our many ways of being in the world, especially for multilingual learners (Moita Lopes, 2002; Pennycook, 2010; Rampton, 2006; Shin, 2013).

Attention to cognitive load or the amount of information frontloaded to students was stressed in engaging students in a hands-on experiment, which assigns meaning to every piece of language students are required

<table>
<thead>
<tr>
<th>Prior knowledge</th>
<th>Cognitive Load</th>
<th>Peer Collaboration</th>
<th>Metacognition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tap into students’ culture and family tradition</td>
<td>Guiding questions for each step of the project</td>
<td>Group work</td>
<td>Narrative reflection</td>
</tr>
<tr>
<td>research and the creation of a landmark</td>
<td>Hands-on building of a model</td>
<td>Peer review</td>
<td></td>
</tr>
<tr>
<td>Use of community resources and history</td>
<td>Sentence frames for every disciplinary aspect of the project as well as oral</td>
<td>Reading circles</td>
<td>Peer feedback</td>
</tr>
<tr>
<td></td>
<td>and written modalities</td>
<td>Group presentation</td>
<td></td>
</tr>
<tr>
<td>Use of L1 (Spanish) and L2 (English)</td>
<td>Vocabulary building through word walls and research</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Past or future options empowering students to create</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>own landmark</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
to use for the high demand writing and speaking tasks of the projects (Gibbons, 2015). In addition, candidates were careful enough to provide word walls, sentence frames, and guiding questions, carefully scaffolding the great amount of academic language included in the project design and tasks. These strategies are very significant if taken into account that effective scaffolding in language teaching and learning diminishes the amount of concepts “pre-taught” to students, selecting key words and phrases, and allowing students to use vocabulary in action, rather than memorizing and manipulating lists of words first, before engaging in the work for the design of the project (Ellis, 2005; Ellis & Shintani, 2014; Nunan, 2015).

**Technology**: One of the requirements of the project design was to have teacher candidates think carefully about ways technological tools and digital literacies could aid in scaffolding the language demands of the project. In addition, in the 21st century, literacy involves not only the ability to read and write with pen and paper, but also the ability to use computers and digital media to effectively engage with others and the world via the Internet (Lankshear & Knobel, 2006; Jenkins, 2009). In “The Landmark Project,” students need to use the Internet actively to do research on the history or cultural traditions of the piece they want to describe and create. As an alternative to typical cardboard models, students could use “Minecraft,” an online game, to create their landmark models digitally. This way, digital media is used purposefully to accomplish the goals of the project while also encouraging K-12 students to become skillful in utilizing tools such as search engines, digital encyclopedias and other websites, and games for real-life goals. The ability to use technology meaningfully to create and collaborate with others seems to be an essential component of our times (Gee & Hayes, 2011; Jenkins, 2009). This is particularly true for linguistically diverse learners that do not have easy access to technology and digital media at home. These students are even more dependent on school to engage them in actively using technological tools meaningfully and intentionally (Warschauer & Matuchniak, 2010).

**Conclusion**

Under the most recent California English Language Development standards (2012) and Common Core State Standards (see http://www.cde.ca.gov/be/st/ss/documents/finaleacssstandards.pdf), English learners should be held to the same high standards and expectations as all students (Zwiers et al., 2014). As shown in this study, if provided the opportunity and adequate training, teacher candidates can provide rich
and vibrant learning environments that demand active student involvement while fostering language learning and engagement in higher-level thinking skills through the design of interdisciplinary projects. However, designing and implementing projects that challenge and support English Learners is not without challenge, as expressed by the teacher candidates in this study. In discussing the possible challenges of project-based learning for the Edutopia website, Suzie Boss highlights the fact that projects can be demanding for teachers who have never experienced this way of teaching and learning before. Boss (2011, para. 14) adds:

PBL [Project-Based Learning] puts teachers in the role of facilitator rather than classroom expert. Teachers may benefit from professional development to help them expand their classroom “tool kit” of teaching strategies. Just as it’s essential that students buy in to PBL, teachers also need to feel empowered. Support from administrators, parents, and other community members can help teachers and students to overcome challenges and make the most of PBL opportunities.

In particular, for teacher candidates, the realities of teaching in a public school, with many demands and timing constraints, might impose a tremendous obstacle. As a result, when becoming first-year teachers, former teacher candidates might not prioritize projects in their curriculum design. Despite the challenges, interdisciplinary projects can be designed and implemented. This demands an effort on the part of all stakeholders involved, though. Teachers, students, and especially English Learners have much to gain from these projects. It is worth a try. As two teacher candidates wisely advise:

Some suggestions or recommendations I would give is to think collaboratively together and be open to suggestions and ideas that your colleagues give to you. Your group should coordinate and make time tables when working together to make sure your all on the same page! (Teacher candidate in mathematics)

And

Do your research. A multi-content project like this doesn’t just come together because it’s a good idea. Each teacher involved would have to actually do the project to completion to see if it worked. There are potentially lots of kinks to work out of a unit like this. (Teacher candidate in English language arts)

References


