Effective Intervention with Urban Secondary English Language Learners: How Peer Instructors Support Learning

Linda Gerena and Leslie Keiler

York College, The City University of New York

The Peer Enabled Restructured Classroom (PERC) program is a peer-teaching model developed by the Math and Science Partnership in New York City (MSPinNYC) to help underachieving and historically at-risk urban students succeed in math and science courses. Although preliminary success of this program has been substantial, there has not been a consistent investigation of the model’s impact with participating ELL/F-ELLs. The focus of this study was to examine the effectiveness of the model with ELL/F-ELLs in a five-week summer program. Although peer-instructors received a three-day orientation and daily seminars, they were not specifically trained in ELL/F-ELL strategies. Questions investigated in this study were: Do bilingual TAS make use of the approaches, behaviors, and strategies that are consistent with the research on second language and content learning? Does the use of the native language by the bilingual TAS, those with linguistic abilities to clarify information, to answer questions and to promote higher level thinking in the primary language, help ELL/F-ELL students to process challenging content area curriculum and achieve academic success? Data based on test results, surveys, interviews, and observations were analyzed. Results indicate success with ELL/F-ELL students but with much underutilized potential.

INTRODUCTION

In response to the clear need for reform of science and mathematics instruction in urban schools, the Mathematics and Science Partnership in New York City (MSPinNYC) developed a student-centered educational model based on peer-instructor support in the classroom, called Peer...
Enabled Restructured Classroom (PERC). This model has been implemented at the secondary level in math and science starting in summer school and then during the academic year in urban, diverse, inner-city classrooms. During summer programs over the past five years, participating students, those who had previously failed the state-required Regent exams during the academic year, have passed these exams at the end of the summer at a rate of 2 to 10 times that of comparison groups. Based upon this success, the program was piloted during the academic year in schools that had struggled to raise performance on Regents exams and increase graduation rates. During the academic year, 20% more students passed their first attempt at the Regents exams at the state-identified target level in classes participating in the program, compared to students in a range of comparison groups. Further, studies of the program’s impact have revealed strongly positive affective responses by the participating students in terms of attitudes to mathematics and science, learning in general, and self-confidence in school (Gerena & Keiler, 2009; Keiler, 2011).

The Regents exams are the New York State content competency exams. In order to graduate from a NYC high school with full recognition, all students in New York now need to pass at least five Regents subject area exams with a minimum scale score of 65 in each to graduate from high school and receive a Regents diploma. One exam must be Integrated Algebra (IA) and another must be in a science, usually biology content called Living Environment (LE). Comprehensive English, Global History and Geography, and U.S. History and Government round out the required exams (NYC Department of Education [NYC DOE], 2010a). In the past, students used to receive a non-Regents local diploma with “sub-Regents” passing level scores of 55, an option that was eliminated with the graduating class of 2009 (NYC DOE, 2009). As of 2012, Regents scores between 65–74 will be classified as the passing level and make the students eligible for a Regents Diploma. A score between 75 and 84 makes the students eligible for a Regents Diploma and admission to a City University of New York (CUNY) Senior College. Scores between 85 and 100 are designated as Mastery levels and award the student a Regents Diploma, with admission to a CUNY Senior College.

Many urban students who initially fail the state Regents exams are English Language Learners (ELLs), or Former English Language Learners (F-ELLs) (Menken, 2008), and these groups are well represented in schools that have participated in the MSPinNYC program. However, while research about the impact of the program in general is strong, there has not been a consistent investigation of the model with ELLs and F-ELLs in particular. The current study began to address this lack and established a research agenda to provide further support to this population. This study explored the experiences of ELL/F-ELLs and their bilingual peer-instructors, called Teacher Assistant Scholars (TAS), in the MSPinNYC 2009 summer school.

NEW YORK CITY ENGLISH LANGUAGE LEARNERS (ELL/F-ELLS) DEMOGRAPHICS

ELL/F-ELLs are the fastest-growing student population in New York City. In 2008, of the 1,052,490 students in the New York City Public School system, 14.1%, or 148,401 students, were identified as ELL/F-ELL. The two largest groups of these linguistically diverse students were Spanish speakers, who accounted for 68% of ELL/F-ELLs, and Chinese speakers, with more than 11.2%. In addition, 41.8% of all students in the New York City school system reported speaking a language other than English at home, and 65,075 students, or 6.2% of the student
population, were new immigrants. These were students who had completed at least six years of ELL/F-ELL services and continued to require language and academic content support. Another 12% of the student population was comprised of F-ELLS, students that had reached “proficiency” on a test of English-language skills and no longer were technically entitled to ELL services. However, continued service may still be provided to assist these students to progress toward New York State standards (New York State Office of Bilingual Education, 2010). This policy is consistent with research indicating that, although no longer eligible to receive ESL services, F-ELLS may still benefit from continued support strategies, scaffolding, and techniques (Curtain, 2009). Additionally, the New York City Department of Education demographic report of 2008–2009 also stated that almost 14% of current ELL/F-ELLS were classified as Long-Term ELLs (LT-ELLS). Long Term ELLs are defined as those students who are classified as ELLs after six years of receiving language services.

Yet, even though ELLs receive services and F-ELLS are entitled to continued services as needed, test scores on Mathematics and English Language Arts standardized exams indicate a substantial achievement gap between ELLs and English-only speakers across age ranges. In New York City in 2010, the aggregate percentage of ELLs in Grades 3–8 who met or exceeded state standards in math (scoring at levels 3 & 4) was 32.2%, compared to 57.9% for English Proficient students. These scores indicate that 67.8% of ELLs are struggling with math across elementary and middle school grades. Additionally, the high school graduation rate in 2009 for ELLs was 44.4%, compared to 59% graduation rate for all students (NYC DOE, 2010b). As a result, both test data and high school graduation rates document the staggering need for identifying and implementing effective teaching models and strategies.

DEMOGRAPHIC CONTEXT OF THE STUDY

This study took place in a summer school program that was specifically designed and developed to use the PERC model with secondary students who would enter 10th and 11th grade in the fall semester, and who had failed either the IA or the LE Regents exams. The students hailed from a variety of high schools in the New York City public education system. The physical location of the program was a senior college in the City University of New York located in Manhattan.

Over the course of a five-week summer program, urban high school students who had failed their Regents exam in June, including 32 former F-ELLS, one currently identified ELL, and one LT-ELL took part in a PERC program as part of the Math and Science Partnership in New York City (MSPinNYC). These students were looking for an alternative to the traditional classroom setting that had already proven to be inefficient and ultimately unsuccessful for learning the difficult content covered by the state-mandated curriculum as measured by state Regents exams. They selected the PERC program, which involved 90 minutes of content instruction planned by the teacher and facilitated by the Teaching Assistant Scholars (TAS) in small groups. An additional 90 minutes of group work focused on interpretation and practice of the exam questions facilitated by the TAS. The TAS are students who guide group activities, scaffold learning of new concepts, and assess student understanding during the PERC class. The TAS-led tutoring focused on working with three to four students to reinforce and clarify the content material, assess students’ knowledge, and prepare them for the exam. In mathematics classes, the group work usually involved solving problems tiered in complexity to facilitate differentiation within
the group. In science classes, the group work varied from lab activities to textbook reading to creating persuasive posters. The lesson ended with a whole-class summary directed by the teacher.

Since the program model revolved around the use of the TAS, criteria for their selection were established. In order to be selected for the academic year program, the TAS must have passed the course and the Regent exam in the relevant subject area. However, advanced Regents scores or eligibility for acceptance into an honors class were not necessary criteria for selection. The TAS who led the group instruction were selected from those who had passed the IA or the LE course and the state Regents exams with a minimum scale score of 70. This placed them above the minimum passing score of 65, but generally below the advanced passing score of 85.

SELECTION AND TRAINING OF TAS

The TAS who participated in this summer program had worked in the model during the academic year and were recommended by their teachers. During that academic year, the TAS spent one class period a day being a peer instructional leader in a PERC IA or LE class and another class period in a TAS class learning how to do this work. During this TAS class, the students interacted with the content teacher to preview upcoming lessons, consider strategies to use with the students, and improve and advance their content knowledge through a more in-depth study of the material they would be teaching. Also during this class, the TAS would debrief lessons taught and discuss with the content teacher their levels of teaching success and frustration, as well as the students' academic progress. The TAS were responsible for assessing the students’ in-class work and completed a daily point rubric for each of the three to four students they were assigned. During the TAS class, the TAS received some support for their content knowledge and teaching behaviors, but before this project, no specific attention had been paid to the needs of ELLs/F-ELLs. During the summer, the teachers spent approximately one-half hour per day receiving feedback from the TAS and preparing them for the following day’s activities.

The TAS earned service credit for being an instructional leader and elective science or mathematics credit for the TAS class. Their performance during the year had been identified as exemplary, and they were recommended by their teachers to work for a salary in the summer program. Selection was made based upon these teacher recommendations, attendance patterns, and student commitment to the program, as indicated in an application essay. As with the student population in the program, many TAS were bilingual.

In this project, although TAS received a three-day training orientation that focused on scaffolding and questioning techniques, motivational strategies, and ways to approach questions on state exams before the program began, with subsequent daily planning seminars with the IA or LE content area teachers, they were not specifically trained in ELL/F-ELL strategies or techniques. Likewise, none of the summer TAS had received any training in how to work with ELL/F-ELL students or implement literacy strategies during their academic year TAS classes.

During the course of this summer program, the students took weekly “mock” Regents exams to help prepare them for the official state exams at the end of the summer program. Mock Regents are previously given official exams that are provided by the state for the purpose of student practice. The TAS also took the mock exams to hone their skills.
RESEARCH QUESTIONS

Given the absence of targeted training about how to support ELLs/F-ELLs, the researchers wanted to document the current TAS practices to determine what was already effective and what could be incorporated into professional development for all TAS and their teachers. Thus, two questions emerged in the planning of this study.

- Do bilingual TAS make use of the approaches, behaviors, and strategies that are consistent with the research on second-language and content learning? (Balderrama & Díaz-Rico, 2006; Coggins, Kravin, Coates, & Carroll, 2007; Corder, 2007; Faltis & Coulter, 2008; Fathman & Crowther, 2006; Gutiérrez, 2002; Johnson, 2009; Lager, 2004; Lincoln & Beller, 2004; McDonnough & Cho, 2009; Meltzer & Hamann, 2005).
- Does the use of the native language by the bilingual TAS—those with linguistic abilities to clarify information, to answer questions and to promote higher level thinking in the primary language—help ELL/F-ELL students to process challenging content area curriculum and achieve academic success?

LITERATURE REVIEW

English Language Learners in the Content Classroom

Second-language acquisition is a complex process that encompasses social and academic language proficiency. Basic interpersonal communication skills (BICS), the language of social interactions, is not sufficient to process challenging content in an academic setting. The language of academic proficiency, also known as Cognitive Academic Language Proficiency (CALP), is developed over many years of academically challenging grade-level content instruction. In science or math, academic language is the context-reduced language of school; it must be explicitly developed. Learners must organize information to process the cognitively difficult concepts and ideas in content area subject matter, such as high school biology or math (Schleppegrell, 2002, 2007). Academic language development for ELL/F-ELLs in challenging content can take considerably longer than social language to fully develop (Cummins, 1981, 1994), especially for students who lack strong prior education in the native language (Chamot, 2000). During this time, ELL/F-ELLs may appear to be fluent in English but will typically struggle with complex academic material. This struggle is often misunderstood as a lack of interest or ability (Olsen, 2010). Lack of academic language skills, poor-quality program, low teacher expectations, and institutional neglect (Boyson, & Short, 2003; Calaff, 2008, 2009; Johnson, 2009; Valdés, 1998; Valenzuela, 1999) can lead to course failure and acts as a de facto barrier to academic success.

Effective pedagogy impacts the learning of second-language learners in the science and math classroom (Beller & Lincoln, 2004; Northwest Regional Educational Laboratory, 2004; Walqui, 2000, 2003). Teachers and tutors of ELL/F-ELLs must be aware of and explicitly teach strategies and ways of learning aligned to best practices in math and science education (Anghileri, 2006; Minstrell & Kraus, 2005; National Research Council, 2001). Pedagogy must include using specific cognitive, metacognitive, and social interactive strategies to help second-language learners become more scientifically and mathematically literate and to develop and expand the
specific skills needed to be successful in the math and science classroom. The development of cognitive skills can help the learner develop an active role in organizing the information to be learned, including note taking, visualizing, drawing, illustrating, predicting, guessing, rereading or relistening. Metacognitive strategies help the learner take steps toward self-monitoring or self-assessing by planning strategies, such as previewing materials, thinking while reading or speaking, reflecting, and maintaining journals or logs. Social affective strategies help learners practice communication and social skills in conjunction with others who are also learning the material (Chamot, 2009; Curtin, 2009; Echeverría, Vogt, & Short, 2008; Peregoy & Boyle, 2008; Vogt & Echeverría, 2008).

Effectiveness of Peer Instruction

A rich literature describes the positive impacts possible from peer tutoring or peer instruction. Research has shown that both tutors and tutees in experimental groups exhibit higher levels of critical thinking (Shamir, Zion, & Ornit-Spector, 2008). It also reveals that learning from “near-peers” (Lockspeiser, O’Sullivan, Teherani, & Muller, 2008) is valuable since the peers have recently studied the material and have struggled with it themselves. Roscoe and Chi (2008) report that the tutors themselves can academically benefit from the process of tutoring other students. Additionally, peer tutoring programs in math have demonstrated that peer tutoring can be effective for African American, other minority students, and European American students who participate as tutors, as tutees, or both (Robinson, Schofield, & Steers-Wentzell, 2005). However, Stoddart, Pinal, Latzke, and Canaday (2002, p. 683) go further to state that: “The integration of authentic hands-on inquiry with linguistic and metacognitive analysis serves to promote the development of higher order thinking skills.” Thus, in addition to understanding the relevant content, tutors must have knowledge about literacy and metacognitive strategies in hand to assure effectiveness in their instruction.

For second-language learners, the benefits of peer interaction have long been established, and research indicates that content learning is enhanced by peer interaction (Calderón, 2007; Chamot, 2009; Curtin, 2009; Faltis & Coulter, 2008; Fathman & Crowther, 2006; Meltzer & Hamann, 2005; Peregoy & Boyle, 2008).

This project was an attempt to connect the findings of the research on effective teaching for second-language learners to a framework that was already underway and demonstrating overall success for urban youth who had experienced difficulty in passing the state Regents exams. Its goal was to determine if the TAS made use of approaches, behaviors, and strategies that were consistent with the research on second-language and content learning to provide effective content instruction. It was also an attempt to determine if the use of the students’ native language would help ELL/F-ELLS process challenging content area curriculum. The ultimate goal was to begin to close the achievement gap between second-language learners and English-only students in achieving academic success.

METHODOLOGY

This research project employed survey, interview, and observational methodologies as well as exam scores. It followed Yin’s advice to focus on a “contemporary phenomenon within some
real life context” (Yin, 2009, p. 1). Acknowledging the limitations of generalizability of this type of research (Yin, 2009), the researchers worked to illuminate promises, possibilities, and limitations for ELL/F-ELL students in the MSPinNYC program. This exploration adds to the growing understanding of the ways ELL/F-ELL students can and should be supported in content classrooms. Through the use of mixed method data collection and analysis techniques, the researchers sought a deep understanding of the experiences of the participants in this learning environment. Throughout the study, the researchers took on the role of participant observers (Merriam, 1988). While the students knew that the researchers were part of the overall program, and that they participated in the program’s development, their role during data collection was strictly that of information gatherers and not as members of the group. Through classroom observations, surveys, and interviews, the researchers explored the extent to which the TAS used ELL responsive strategies and the native language to facilitate content learning and generate a positive impact on ELL/F-ELL students’ content knowledge and Regents exam outcomes.

While the focus of the study was to observe the TAS’ use of effective strategies and the native language, the researchers analyzed the end-of-program Regents scores, examining whether or not the participating students performed better than comparison students on the exit Regent exams in order to illuminate the impacts of the strategies being used. In addition, the researchers examined the pre- and postmock exam scores of the TAS to explore the impacts of teaching the strategies on the TAS’ own performance.

Participants

The Researchers

The researchers were both involved in the planning and delivery of the program. Researcher 1 was an expert in bilingual education and second-language acquisition theory and was experienced in teaching ELLs at all grade levels. Researcher 2 was an expert in secondary science education and taught biology and environmental science in middle and high school that included ELL students. Although both researchers were involved in the program, care was taken to avoid biases in the collection and analysis of all data (Foster, 1996). The researchers were careful to remain neutral in tone, facial expressions, and body language. They did not express their personal opinions when asking questions or when listening to responses. Care was taken to not ask leading questions that might slant a response. When discussing responses, care was taken not to alter the intent of the response, or to put words into the interviewees’ mouths. The questions asked were straightforward and concrete. When students needed clarification, it was provided simply and with a friendly tone. No one student was allowed to dominate the interview sessions, and all participants were encouraged to share their opinions and perspectives. The current study was pivotal in the development of an on-going professional development program for teachers and TAS, making accurate documentation and analysis of this starting point essential for the researchers.

Teaching Assistant Scholars (TAS)

Thirty high school TAS participated in the summer 2009 program. Twenty-nine completed a language identification survey. Based on survey results, 11 (37%) TAS in the program were
English-only speaking, while 18 (60%) were bilingual or spoke another language. Overall, 15 bilingual TAS (83% of the self-identified bilingual TAS) reported that their oral communication and literacy skills in their first language (able to read, write, and explain content material) were either fairly well or very well developed. Only the Bengali, Nigerian, and Creole speakers self-identified their native language linguistic abilities as “Not very well” or “Not at all capable” of reading, writing, and explaining academic content in their native language (Tables 1 and 2).

There were four classes in the program. In Class A (LE) there were four self-identified bilingual TAS: three Spanish speakers and one who spoke Bengali. In class B (LE) there were five bilingual TAS: three spoke Spanish, one spoke Polish, and one spoke French. In Class C (IA)

<table>
<thead>
<tr>
<th>Tutor</th>
<th>Language</th>
<th>Literacy</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAS 1</td>
<td>Spanish</td>
<td>All: Fairly well</td>
</tr>
<tr>
<td>TAS 2</td>
<td>Spanish</td>
<td>All: Fairly well</td>
</tr>
<tr>
<td>TAS 3</td>
<td>Spanish</td>
<td>All: Fairly well</td>
</tr>
<tr>
<td>TAS 4</td>
<td>Bengali</td>
<td>All: Not very well</td>
</tr>
<tr>
<td>TAS 5</td>
<td>Spanish</td>
<td>Write: Very well</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Read/Explain: Fairly well</td>
</tr>
<tr>
<td>TAS 6</td>
<td>Spanish</td>
<td>Read: Very well</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Write/Explain: Fairly well</td>
</tr>
<tr>
<td>TAS 7</td>
<td>Spanish</td>
<td>Read/Explain: Very well</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Write: Fairly well</td>
</tr>
<tr>
<td>TAS 8</td>
<td>Polish</td>
<td>Read/Explain: Fairly well</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Write: Fairly well</td>
</tr>
<tr>
<td>TAS 9</td>
<td>French</td>
<td>Read: Very well</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Write/Explain: Fairly well</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tutor</th>
<th>Language</th>
<th>Literacy</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAS 10</td>
<td>Spanish</td>
<td>All: Very well</td>
</tr>
<tr>
<td>TAS 11</td>
<td>Spanish</td>
<td>All: Very well</td>
</tr>
<tr>
<td>TAS 12</td>
<td>Cantonese</td>
<td>All: Very well</td>
</tr>
<tr>
<td>TAS 13</td>
<td>Chinese</td>
<td>All: Very well</td>
</tr>
<tr>
<td>TAS 14</td>
<td>Creole</td>
<td>Read/Write: Not very well</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Explain: Fairly well</td>
</tr>
<tr>
<td>TAS 15</td>
<td>Efik (a Nigerian language)</td>
<td>All: Not at all</td>
</tr>
<tr>
<td>TAS 16</td>
<td>Albanian</td>
<td>Read/Write: Very well</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Explain: Fairly well</td>
</tr>
<tr>
<td>*TAS 17</td>
<td>Spanish</td>
<td>Read/Write: Very well</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Explain: Fairly well</td>
</tr>
<tr>
<td>*TAS 18</td>
<td>Georgian</td>
<td>All: very well</td>
</tr>
</tbody>
</table>

*Did not participate in study.
there were seven bilingual TAS: two spoke Spanish, two spoke Cantonese Chinese, one spoke Haitian Creole, one spoke Nigerian, and one spoke Albanian. In Class D (IA) there were two self-identified bilingual TAS: one spoke Spanish and one spoke Georgian. However, this fourth class did not participate in this study for reasons stated below.¹

**PERC Student Demographics**

Participating students were asked to complete a preparticipation written survey. The survey was administered in English. Based on their responses to the initial surveys, 39 out of 114 (34%) students self-identified as speakers of a language other than English as either current ELLs or F-ELLs. However, upon further investigation (using interviews with students and teachers, DOE data information) four more students were identified as ELL/F-ELL for a total of 43 ELL/F-ELL students (38%) in the four classes. Of these 43 students, 11 (25%) were in the nonparticipating Class D and are not included in the study, leaving a total of 32 identified ELL/F-ELLs in the three participating classes (A, B, & C). Of this total, 30 students (94%) were classified as F-ELLs, one was classified as a current ELL, and one student self-reported as a LT-ELL (Table 3).

In Class A (LE), nine students were identified as F-ELLs, and all were Spanish-speaking students. There were 10 F-ELLs in class B (LE), and of these, nine spoke Spanish and one spoke Bengali. In Class C (IA) there were 13 identified students: one current ELL, 11 F-ELLs, and one LT-ELL. All spoke Spanish except for one F-ELL Korean speaker (Table 4).

Of the 32 participating ELL/F-ELL students in the research study, 23 (72%) completed the entire survey. In their responses to the survey, two students (9%) stated that they expected to earn less than the minimum passing score of 65; 15 students (65%) expected to score between 65 and 74; five students (22%) expected a score between 75 and 84, and only one student (4%) expected a scaled score between 85 and 99. Thus, most ELL/F-ELL students expected to pass, but not at a level with many options for higher education. Sample comments about what the students perceived to be the most difficult part of preparing for or taking the Regents exams included their own lack of study skills, having to memorize terms and vocabulary, knowing which material to study, writing short answer questions, solving problems, remembering formulas, and answering the multiple choice questions (Table 5).

<table>
<thead>
<tr>
<th>Speak Another Language</th>
<th>Participating in Study</th>
<th>Current ELL</th>
<th>Former ELL</th>
<th>Long-Term ELL</th>
</tr>
</thead>
<tbody>
<tr>
<td>32</td>
<td>Yes</td>
<td>1</td>
<td>30</td>
<td>1</td>
</tr>
<tr>
<td>11</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

¹Teachers in the program were permitted to opt into/out of the research study. In the fourth classroom team setting, the teachers and TAS believed the 11 former ELL/F-ELL students were not in need of any specialized intervention other than the general PERC model and so they declined to participate. Therefore, this class was not observed or examined over the course of the remaining weeks of the program.
### Table 4

<table>
<thead>
<tr>
<th>Language</th>
<th>ELL/F-ELL/LT-ELL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class A</td>
<td>9 Spanish</td>
</tr>
<tr>
<td>Class B</td>
<td>9 Spanish, 1 Bengali</td>
</tr>
<tr>
<td>Class C</td>
<td>12 Spanish, 1 Korean</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Class D</td>
<td>Did not participate</td>
</tr>
</tbody>
</table>

### Table 5

<table>
<thead>
<tr>
<th>Total Responses</th>
<th>Expect to Earn Less Than 65 (Fail)</th>
<th>Expect to Earn 65–74 (Passing)</th>
<th>Expect to Earn 75–84 (Regents Diploma)</th>
<th>Expect to Earn 85–99 (Mastery)</th>
</tr>
</thead>
<tbody>
<tr>
<td>23</td>
<td>2</td>
<td>15</td>
<td>5</td>
<td>1</td>
</tr>
</tbody>
</table>

**The Teachers**

Six participating teachers were distributed over the three classrooms: two IA teachers and four LE teachers. Teachers were in a team teaching structure and did daily planning both with TAS, other team members, and content and ELL/F-ELL research faculty. All the teachers were certified in the subject matters that they were teaching.

**Data Collection**

Quantitative data were collected by examining the end-of-program Regents test results and qualitative data through surveys, student and TAS interviews, and on-going observations throughout the summer session. Observations throughout the summer focused on the small-group interactions between the ELL/F-ELLs and the TAS. Observed behaviors included how the TAS incorporated background knowledge and experiences; demonstrated strategies and techniques consistent with best practices associated with teaching second-language learners; made use of supplemental materials; and where possible, how the primary language was used. Special attention was paid to this last criterion.

**Student and TAS Language Status Identification Surveys**

The first step in providing appropriate support for the students was to identify which students were ELL/F-ELLs and to identify the TAS who were bilingual. Since students’ academic records are not available to summer school teachers, language information was not available until the preparticipation language and perceptions survey was administered during the first week of classes. The objective of the survey was to identify the bilingual TAS and the ELL/F-ELL
students by asking the participants themselves. A language, achievement, and perception survey was administered that asked TAS and students about their English-language proficiency, their oral and written proficiency in English and any other languages they spoke, as well as their past or present identification as an ELL/F-ELL, and their attitudes and experiences in the content material. In addition to the surveys, teachers spoke with students regarding their language backgrounds, and as a result more data on ELL status became available.

Groupings of Bilingual TAS and Students in Three Classes

Students and TAS participating in the program had been randomly assigned to one of the three participating content area classes (A, B, C) and to groups within the classroom before the language demographics analyses were completed. As a result, in some cases, pairing of bilingual TAS to former or current ELL/F-ELL students was not accomplished until well into the second week of the five-week program. This delay represented an almost 20% reduction in potential time spent with the bilingual TAS. Once this language information was collected and analyzed, changes in the groupings and language pairing began in the three participating classrooms.

Observations

The researchers observed three participating classrooms on a daily basis over the course of the summer program. During classes, the researchers sat with or near a small group, listened to teacher and student conversation, and observed group dynamics and work products. During the observations the researchers took detailed qualitative field notes, documenting conversations between the TAS and their students. The researchers elected not to use a specific observation protocol so that the comprehensive experience could be captured rather than predetermined details, as is appropriate for this type of qualitative/quantitative exploratory study (Stebbins, 2001). Each class was observed at least once a week throughout the summer. These classroom observations provided a critical data set of the study, and findings from the observations helped craft the interview questions. The researchers spent an average of three hours a day, four days a week, over a three-week span observing the team teaching in the two LE content classes (A and B) and the one IA content class (Class C). Observations focused on the TAS interacting with the ELL/F-ELL students.

Interviews

During the course of the program, unstructured interviews were conducted with the TAS to allow for “an in-depth understanding of a particular phenomenon within a particular cultural context” (Zhang & Wildemuth, 2006), and field notes were recorded. This allowed for on-going data gathering without establishing any predetermined questions or expected responses. At the end of the program, semi-structured interviews, neither an open conversation nor a highly structured questionnaire, were used to collect data from the TAS and the participating students.

At this point, the researchers elected to use semi-structured interviews to access final TAS perceptions on their experiences as well as student perceptions of their experiences because it allowed for a flexible dialogue on ELL/F-ELL issues between the TAS, and the researchers,
and among the participating students (Kvale, 1996; Merriam, 1988), yet provided the freedom to pursue the topic according to the responses provided. An interview protocol was used for the semi-structured interviews for both groups.

Most student interviews occurred in pairs or small groups of three to four students. The researchers elected to interview the students and TAS in pairs and small groups in order to increase their comfort level with the experience and enable them to support each other in recalling events and decisions. Conducting the interviews in this manner enabled the researchers to ensure that each student had a voice in the responses and because group interviews are “inexpensive, data rich, flexible, stimulating to respondents, recall aiding, and cumulative and elaborative, over and above individual responses” (Fontana & Frey, 1994, p. 365).

There are limitations to asking students to interpret their own experiences, especially for those students who face linguistic challenges in their traditional classrooms. However, according to Palincsar and Brown (1989), Swatton (1995), and Shulman and Quinlin (1996), interviews allow researchers to gain access to students’ insights, perceptions, cultural capital, values, and experiences. Thus, simply analyzing the ELL/F-ELL students’ test scores would not provide the deep insights necessary to make vital pedagogical decisions that can be gained from student interviews. As such, the results of interviews can be useful in making decisions and developing future changes to the program in which the participants are interviewed. However, the researchers had to be aware that group dynamics can impact individual responses, and care was taken so that all participants had an opportunity to express their perceptions and thoughts and that no one group member dominated the conversation (Fontana & Frey, 1994). The researchers gave all students multiple opportunities to respond to the questions asked. If a student was not responding, the researchers prompted that student to share his/her thoughts.

Data Analysis

Qualitative information was collected through the observations and interviews. As recommended by Krueger and Casey (2009) and Yin (2009), data collected through interviews and observations was analyzed and interpreted beyond just descriptive reporting. Analysis and interpretation of the raw data collected during observations and interviews was studied for findings, themes, and suggestions and included both descriptive and interpretive summaries. Information from the surveys was analyzed to gather demographic and linguistic information on the students and the TAS. The surveys also served to provide the researchers with the TAS and PERC students’ perceptions, beliefs, and attitudes toward the subject material and achievement possibilities.

Quantitative data were collected through the exam results. At the completion of the program, the students took the state Regents exam in the appropriate content areas (LE or IA) analysis.

QUALITATIVE FINDINGS AND ANALYSIS

Classroom Observation: Strategies Used by TAS

The classroom observations and interviews with ELL/F-ELL students and their TAS yielded a wealth of information. In all three participating classrooms, the bilingual TAS who spoke Spanish
were paired with the former and current ELL/F-ELL students. As stated previously, not all ELL/F-ELLs were accurately identified from the first day of classes and thus were not appropriately matched with the bilingual TAS. Because teachers were focused on daily content planning and delivery, they had to be encouraged to rearrange student groupings to assure appropriate linguistic matching of bilingual TAS and ELL/F-ELL students.

Based on class observations, all the TAS used the home language (Spanish) when necessary. TAS were observed using the first language to clarify concepts and check for understanding. In the case of the current ELL student in math class C, Spanish was the main language of instruction between the TAS and the student. Other TAS used Spanish intermittently, switching to English when the group included non-Spanish speakers. Since most of the students were F-ELLs, TAS mostly spoke English to their students. However, for the current ELL and the LT-ELL, Spanish was used extensively. For these students, the use of the primary language was indispensable to their comprehension of the material.

Strategies used by the TAS included writing things out, asking probing questions, restating or paraphrasing questions or concepts, and employing whiteboards and the chalkboard to illustrate or model problems and concepts. In all three classrooms, TAS were observed using illustrations, visuals, diagrams, and mapping to explain concepts. In the LE classes, hands-on activities, manipulative materials, graphic organizers, and visual representations were also used extensively. Many of the activities in Classroom A and B (LE) used inquiry-based and exploratory hands-on activities that helped the TAS explain essential concepts. In all classes, the TAS were patient and allowed students adequate time to respond to their questions, employing wait time (Rowe, 1986). The TAS would try to explain concepts using the students’ background and experiences and many times referred to cognates in Spanish with technical or scientific vocabulary.

**TAS Interviews: During Program Participation**

In conversations and interviews with the TAS during the program, many essential teaching strategies were uncovered. The following excerpts are from TAS interviews that were carried out during the five weeks of the program. All names are pseudonyms.

Marco, the TAS working with the current ELL student Antonio, stated during the third week of the program that he would slow down the pace of the lessons. “I would go slower with Antonio and work through the problem step-by-step. For example, today there were three different kinds of problems and the teacher only explained one kind. That was very confusing for him.” The pacing of the lessons was very rapid, due to the shortened time span of the summer program. The TAS knew almost intuitively that timing and pacing is an important issue in considering ELL and former ELL instructional patterns (Echeverría, Vogt, & Short, 2010).

In a conversation with another bilingual TAS, Carla stated “If you tell them in their language, they will understand it better. Using visual and drawing pictures also has helped me explain the work to Eduardo.” What Carla was alluding to was providing comprehensible input, that is, material presented in ways that make it understandable to the ELL/F-ELL student (Echeverría et al., 2010; Faltis & Coulter, 2008; Krashen, 2003; Peregoy & Boyle, 2008).

Another TAS, Rosario, stated, “There are so many words in Spanish that look like English words so I use those words to try and get Miguel to understand what we are talking about.” Rosario was referring to the use of cognates, words in English that have a common Latin base,
that appear the same and have the same meaning. Using cognates is another strategy that has been found to be effective with students who speak Romance-based languages such as Spanish (Coggins et al., 2007; Nutta, Bautista, & Butler, 2011).

**TAS Postprogram Interviews**

In the postprogram interviews held during the final days of the program, TAS were interviewed in pairs and small groups and asked to respond to questions referring to the approaches, accommodations, and strategies that they used to teach the content in understandable (comprehensible) ways. TAS discussed strategies that included a wide range of instructional methods such as visualizing, drawing, listing words, rephrasing, asking questions in another way, and using students’ background when incorporating the real-world experiences. However, all TAS mentioned that, above all, breaking things down to their smallest part was the most important strategy that they used. The TAS were hopeful yet anxious about their students’ ultimate success on the Regents exam. They believed that their students were ready and well prepared. Several TAS stated that they would consider it a personal failure as a TAS if their students did not pass.

**Student Interviews: Postparticipation**

In the postparticipation student interviews during the final days of the program, the current ELL and LT-ELL students described the use of Spanish as critically and absolutely essential to their understanding of the material. In contrast, most F-ELLs claimed that using Spanish was not as important as having the TAS explain the concepts and problems. However, one F-ELL student claimed, “When I have a problem she (the TAS) speaks to me in Spanish. Sometimes in English I don’t understand it. It really helps when she tells me in Spanish.” What was interesting about this response was the fact that this F-ELL would normally not be identified as a second-language learner in need of any intervention. When this student’s comment is analyzed, it is clear that complex linguistic structures such as clauses, ellipsis (the omission of “me” after the word “helps”), correct subject-verb agreement, correct verb tenses, etc., are being used. In other words, this student would probably not be targeted for any intervention since she/he had obviously mastered English at a fluent level. However, this student indicated that the use of the home language could be a resource and an effective intervention, especially with difficult content material such as high school science and math, even if the student is officially classified as a “Former-ELL.”

Some students mentioned that it was important for them that their TAS understood “where they were coming from” and that it provided them with a “kind of trust” in the TAS. A common home language developed this relationship, in addition to supporting content understanding. The ELL/F-ELL PERC students consistently stated that the use of the home language gave them a feeling of connectedness with the TAS, “When the TAS speaks Spanish you have a connection, like a comfort; that was helpful.” The students were very clear that the fact that their TAS shared their cultural background and language was very important to them, making them feel understood in this academically complex context. They claimed, “It was like she could understand me. She could understand how I felt,” and “I love this program. The TAS try to collaborate with us, cooperate. I feel so much better in this program. The TAS understands us.” A student, when asked how the TAS included their backgrounds, responded, “When the TAS was explaining about
‘antibodies’ she asked, “What do you do to get ready for a fight?” While this may inject a negative connotation and associate English-language learners with violence, it is a clear indication of many of these students’ perceptions and reactions to the world around them. It mattered to them that the TAS understood their sense of reality. Another student stated “I love the way my TAS used real examples; she connected to my real life.” Statements such as these illustrated a recurring theme: ELL/F-ELLs had a sense of comfort with their bilingual TAS and connected with them because they shared this background and language. For ELL/F-ELLs this sense of connectedness could be a factor in lowering the “affective filter,” one of the core best practices for second-language learners. A low affective filter environment lowers student anxiety, facilitates language acquisition, high motivation and self-confidence, and allows students to better concentrate on learning (Krashen, 2003).

Besides the use of the home language and personal connections, students mentioned that the most important thing the TAS did was to be patient (increased wait time, or the time the TAS waited after asking a question before expecting students to respond) and to “break things down into smaller and simple pieces.” One student claimed, “They (the TAS) go slow and show me more attention.” The students also indicated that the strategies the TAS used helped them to understand the difficult concepts being taught. The students gave examples such as, “They showed us details, they used simple words, and examples to make it easier for us.” The strategies that the students found to be effective included using appropriate rates of speech; using explicit examples; demonstrating; modeling; using visuals (pictures, drawings, charts, maps, graphic organizers) and realia (real items); scaffolding instruction from the simple to the complex; allowing for additional wait time; using hands-on materials and manipulatives; Total Physical Response (TPR), which incorporates using actions to convey meaning (Peregoy & Boyle, 2008); gestures; and working in cooperative groups, pairs, or buddies. One student explained, “She drew and illustrated. She would get up and do an action, which helped me a lot.” The students unanimously stated that the ability to talk with the TAS and to work in cooperative groups was critical and crucial to their ability to process the content and to achieve a greater grasp of the concepts they had to learn. They also enjoyed the hands-on activities that were conducted in the LE classes.

Many ELL/F-ELLs stated that since they could understand the work, and they were scoring higher on the weekly mock exams, they liked the subject matter better and had a better sense of confidence than before the program. All the students interviewed hoped to pass the Regents exam, although several expressed a sense of doubt that they would. Some were hopeful of earning well above the minimum passing score of 65.

**QUANTITATIVE FINDINGS AND ANALYSIS**

**Postparticipation Test Results**

Of the 32 ELL/F-ELL students who participated in this study, 24 took the Regents exams at the end of the program, and eight were absent on the day of the exam. Table 6/Figure 1 and Table 7 show their results and compare them to the English-only students in the same program/classes.

These results demonstrate a clear closing of the achievement gap. Although New York City does not report disaggregated ELL/F-ELL scores on the citywide Regents exams, based on
TABLE 6
Overall Pass Rates

<table>
<thead>
<tr>
<th></th>
<th>Class A</th>
<th>Class B</th>
<th>Class C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall class pass rate</td>
<td>60%</td>
<td>69%</td>
<td>95%</td>
</tr>
<tr>
<td>Overall ELL/F-ELL pass rate</td>
<td>77%</td>
<td>66%</td>
<td>89%</td>
</tr>
<tr>
<td># ELL/F-ELL examinees</td>
<td>9</td>
<td>6</td>
<td>9</td>
</tr>
</tbody>
</table>

FIGURE 1 Overall pass rates (color figure available online).

TABLE 7
Comparison Rates Between ELLs/F-ELLS and EO Students

<table>
<thead>
<tr>
<th>Level 1: 0–54 Failing</th>
<th>Level 2: 55–64 Sub-Regent</th>
<th>Level 3: 65–74 Passing</th>
<th>Level 4: 75–84 Passing</th>
<th>Level 5: 85+ Passing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Eligible for Local Diploma Only</td>
<td>Eligible for Regents Diploma</td>
<td>Eligible for Regents Diploma and CUNY Senior College Admission</td>
<td>Mastery Regents Diploma and CUNY Senior College Admission</td>
</tr>
<tr>
<td>24 ELL/F-ELL</td>
<td>2 (8.3%)</td>
<td>3 (12.5%)</td>
<td>10 (41.6%)</td>
<td>8 (33.3%)</td>
</tr>
<tr>
<td>33 EO</td>
<td>4 (12.1%)</td>
<td>5 (15.2%)</td>
<td>15 (45.5%)</td>
<td>8 (24.2%)</td>
</tr>
</tbody>
</table>

the New York City annual Math and English Language Arts test data, ELLs have historically performed below other students in math and reading (NYC DOE, 2010c). The graduation rate in 2009 for ELLs was only 44.4% (NYC DOE, 2010b). Since passing the Regents exams is a necessary criterion for high school graduation, successful results on the Regents exams become imperative to student success. If the high school graduation achievement gap is to narrow, students must successfully pass these exams. The exam results in this study are very promising in that in almost all categories, the ELL/F-ELLS performed as well as or better than their English-only counterparts in the program.
While not the focus of this study, a most encouraging finding was the final results of the TAS mock exam scores. The differences between the initial TAS mock exam and the final mock exam were substantial. Of the 18 bilingual TAS, 15 took the mock exams and all improved their scores with a range from +16 points to +39 points, thus suggesting that implementing these strategies also deepened the TAS’ own content knowledge.

**THEMES AND CONCLUSIONS**

Two questions were investigated in this study. The first question was whether or not the bilingual TAS exhibited ELL-centered approaches, behaviors, and strategies that are consistent with the research on second-language and content learning. The second question dealt with whether or not the bilingual TAS’ use of the students’ native language in their teaching helped students to process challenging academic curricula. While our methodology does not allow us to attribute causation, the TAS and student participation and exit interviews and the final Regents exams results suggest that the questions posed at the beginning of the study were addressed and supported. As a result, several themes emerged from this study, and the practices being used by these TAS have the potential to be the model for future TAS in the program.

TAS did indeed show an appreciation of the linguistic challenges faced by ELL/F-ELLs in the study of academic content. They broke concepts down into manageable chunks, allowing the ELL/F-ELLs to process difficult content successfully. TAS consistently used student background and experiences to clarify and explain concepts. TAS utilized manipulative materials, graphic organizers, and other visual aids to provide comprehensible input. The TAS explained key terms, and often they were observed using synonyms or English–Spanish cognates to build student vocabulary within the content area. Many times vocabulary or concepts were explained in the native language (Spanish). In most student interviews, TAS were credited with being patient and allowing students to process questions, think about their answers, and formulate a response without being pressured to respond quickly (increased wait time).

Bilingual TAS exhibited ELL/F-ELL-centered approaches, behaviors, and strategies in their interventions, and the use of the primary language seemed to positively impact the outcomes of the ELL/F-ELLs in the program. Unfortunately, due to incomplete and late language identification, some of the bilingual TAS were not paired with their ELL/F-ELLs until late in the second week of classes. This delay may have limited the impact of the TAS for these students. Of the five failures, two were identified as ELL/F-ELLs late in the program and were not assigned a bilingual TAS until the middle of the second week. Of the eight ELL/F-ELL absentees, three were students who were identified as ELL/F-ELLs late in the program. Earlier identification of the students’ language levels would give teachers and TAS the opportunity to prepare and plan with these students’ linguistic needs in mind.

While the TAS exhibited ELL/F-ELL-centered approaches, behaviors, and strategies, their use was based upon the TAS’ own experiences rather than a systematic approach to ELL/F-ELL instruction within the program. For example, their understanding of linguistic challenges was from their own backgrounds rather than training in linguistic diversity found in their classrooms. Also, while the LE classes used manipulatives, no attention was paid to how these materials should be used with ELL/F-ELL students in particular. Further, the TAS did nothing to facilitate interactions among students in their groups to improve oral discourse, nor did they develop or
use specific literacy skills with their students. Thus, while the TAS were successful in many ways in their support of their ELL/F-ELLS, there are several ways the TAS could have extended this vital learning experience.

The second question dealt with the use of the primary language. This question explored whether or not the bilingual TAS, those with the linguistic abilities to clarify information, to answer questions, and to promote higher level thinking in the primary language, would help at-risk ELL/F-ELL students to process challenging content area curriculum and achieve academic success as evidenced by passing the high stakes Regents exams in LE and IA.

While it cannot be stated that the presence of the TAS directly affected the Regents scores, the test scores of the ELL/F-ELLS who participated in this program and who had bilingual TAS performed better than, or nearly as well as, their native English-speaking classmates. As seen in the NYC data sets, this achievement—that is, performing better than or nearly as well as English-only students—is not a usual outcome for ELL/F-ELLS on state-standardized tests in NYC. Thus, their performance was greater than the predicable outcomes that could be made based on historical test data provided by the New York City Department of Education data files.

As a result of this preliminary study of ELL/F-ELLS in the PERC program the following conclusions have emerged:

- Students and TAS need to be matched linguistically if the student is an ELL/F-ELL. This should be done in a timely manner, preferably before classes begin.
- Using the students’ background experiences and home language for concept clarification should be encouraged.
- Effective best practices, such as scaffolding content material and incorporating ELL/F-ELL-centered approaches, behaviors, and strategies, strengthen TAS effectiveness in secondary Integrated Algebra and Living Environment content and can have beneficial results in improving ELL/F-ELL academic success. While many of the TAS used language-learning techniques and tools based on their own experiences, they should be trained to consistently and appropriately use and demonstrate cognitive and metacognitive learning strategies and techniques.
- All TAS should be explicitly taught to use research-based, effective literacy strategies in their small-group teaching.
- Effective practices need to be incorporated into professional development for all TAS and their teachers.

GOING FORWARD

In their discussion of the strategies that they used, none of the TAS referred to any literacy-specific strategies other than the use of cognates. Given the research on the effectiveness of using literacy-based strategies with second-language learners, this became a priority for preparing future TAS to work more effectively with ELL/F-ELLS. A review of the literature on reading effectiveness and literacy for second-language learners and a review of research findings (August & Shanahan, 2006; Balderrama & Díaz-Rico, 2006; Calderón, 2007; Carlo et al., 2004; Corder, 2007; Curtin, 2009; Faltis & Coulter, 2008; Farrell, 2009; Genesee, Lindholm-Leary, Saunders, & Christian, 2006; Meltzer & Hamann, 2005) have shown that second-language learners must be
given explicit training and teaching in cognitive and metacognitive strategies to help them process complex, academically challenging materials while they are acquiring a second language. It has also been shown that second-language learners at the middle and high school levels need to develop specific literacy skills in order to be successful in the secondary content area classroom. In fact, Meltzer and Hamann (2005) state that “If, as student outcome data suggest, traditional approaches to content-area teaching and learning are not meeting the needs of many students, serious changes are in order” (p. 61).

At the end of the summer program, the researchers examined this study’s findings along with past research (Gerena & Keiler, 2009, 2010) in an effort to generalize the findings. The goal was to promote similar results in other schools within the PERC program. As a result, a pilot intervention focusing on literacy-based strategies to address the particular learning needs of the ELL/F-ELL students in the MSPinNYC PERC program is currently underway to explore the following two research questions:

- What must TAS know in order to be successful at helping other students learn?
- How can TAS effectively support the learning of ELL/F-ELL students?

While the research questions may appear similar to the present study, this pilot is addressing specific ELL/F-ELL literacy issues in a structured and deliberate way, to improve the academic and linguistic outcomes for ELL/F-ELLs in a secondary biology content class. It is hoped that introducing and developing literacy strategies will improve the linguistic and content knowledge of ELL/F-ELLS, raise performance levels on high stakes tests, and contribute to closing the achievement gap.

ACKNOWLEDGMENTS

The MSPinNYC is supported by funds from the National Science Foundation Grant # 40560-0001.

REFERENCES


Northwest Regional Educational Laboratory. (2004). *English Language Learner (ELL) programs at the secondary level in relation to student performance*. Portland, OR: NWREL.


