Literacy Squared® Phase II: Colorado Case Study Technical Report
Year Three, 2011-2012

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Executive Summary

In 2005, the University of Colorado entered into a research project with six elementary schools in the Denver Public School District (DPS) and one elementary school in Boulder Valley School District (BVSD). This project titled, Transitions to Biliteracy: Literacy Squared® is a comprehensive biliteracy model that has been designed to accelerate the development of biliteracy in Spanish-English speaking children attending schools in the U.S. The Literacy Squared model is both research-based and research-tested. Its conceptual framework draws on research positing that a dire need exists for a new theory about literacy instruction for emerging bilingual children (Bernhardt, 2003; Grant & Wong, 2003), and that second language literacy acquisition is greatly enhanced if learners are literate in their first language (August & Shanahan, 2006).

Literacy Squared has four components that include:

1. Research
2. Assessment
3. Professional Development
4. A Comprehensive Biliteracy Instructional Model that includes Spanish literacy, cross-language connections, and literacy-based ESL

These four components are essential to the Literacy Squared model and have been refined through our continued collaboration with various school districts, schools, administrators, teachers, and students in the past seven years.

The Literacy Squared Phase I findings were positive and indicated great potential; therefore, it was decided to continue the project into Phase II on a more limited basis with three case study schools (two in DPS and one in BVSD). Literacy Squared Phase II: The Colorado

Case Study began in the fall of 2009 and was completed in the spring of 2012. Phase II was designed to enable the project to do more in-depth case studies. There were several purposes for the case study inquiry in Colorado including:

1. To examine whether or not there is an association between fidelity of implementation of the Literacy Squared® biliteracy model and the biliteracy achievement of emerging bilingual learners.
2. To explore if biliteracy outcomes improve for students who have experienced teachers who are high implementers of Literacy Squared across grade levels in order to understand longitudinal biliteracy outcomes.
3. To understand better how professional development may also be linked to improvement in levels of implementation.
4. To continue to examine students' longitudinal achievement in Spanish and English reading and writing from 2009-2012, and to examine results vis-à-vis trajectories toward biliteracy.

This technical report represents Year 3, the final year of the Case Study research project and it provides a summary of the successes and challenges for researchers, practitioners, and school sites as they endeavored to implement all components of this project.

Colorado Case Study

Two elementary schools in Colorado participated in Year 3 of this study: Charles M. Schenck Community School (CMS) in DPS and Columbine Elementary School in BVSD. Valverde Elementary in DPS had been a participant in Years 1 and 2 of Phase II, but with the change of leadership in the 2011-12 school year decided to withdraw from the research project. Both CMS and Columbine participated in Phase I of the research project. The participating

schools are highly segregated. Over 80% of the students are Latino, over 70% qualify for free or reduced priced lunch (FRL), and the majority of the student population is labeled as English language learners (ELLs). In general, school demographics noted above are typical of urban schools across the U.S. It is precisely schools with these demographic characteristics that the Literacy Squared research project was designed to serve.

Maximizing Fidelity of Implementation: Professional Development and On-site Support

Sustained and multi-leveled professional development opportunities were provided for all case study schools in order to enhance and develop teachers' capacity to implement fully Literacy Squared and to increase leadership's ability to support implementation of the biliteracy model. A unique aspect of the case study involved the varied level of support each school received based on their strengths and needs. Both schools received three general professional development sessions in Year 3 and additional on-site support. Site-specific support was provided by a Literacy Squared research liaison that worked closely with the schools' site coordinators to ensure teachers had a working knowledge of various components of the Literacy Squared model.

CMS Elementary received on-site support for six teachers in Literacy Squared classrooms and additional support for teachers in the English-only strand. In sum, CMS Elementary received 22 days of on-site support from two Literacy Squared research team members. The on-site support included: observing teachers and providing feedback; lesson planning; modeling and co-teaching biliteracy/literacy-based ESL lessons; explaining the biliteracy model; and discussing levels of implementation. One research liaison worked at Columbine Elementary and provided eleven days of on-site support. A major focus for the on-site support at Columbine was on ensuring cooperating teachers who taught Spanish literacy and literacy-based ESL separate from

one another understood how to connect the literacy environments in order to capitalize on students' strengths, make cross-language connections, and teach to students' biliterate potential.

Fidelity of Implementation

Another purpose of the study was to explore if biliteracy outcomes are enhanced across grade levels for children who experience teachers who are high implementers across single or multiple school years. Section 3 of this report examines the level of fidelity of implementation of Literacy Squared in individual classrooms and teachers. It is axiomatic that the impact of any instructional program can only be measured and understood if a said program is implemented with fidelity. Literacy Squared is no exception. During the three years of the case study, the project invested a great deal of time and energy into assuring that schools and teachers were implementing Literacy Squared with fidelity. There are several unique aspects of the Literacy Squared Comprehensive Biliteracy Instructional Model that are quite new to the field of bilingual or dual language education and are new even to teachers who have State Bilingual/ESL endorsements. Unique aspects of the model include, but are not limited to: paired literacy instruction beginning in kindergarten; holistic bilingual assessment in Spanish and English reading and writing; creating a discourse around biliteracy zones; and expanding biliteracy instruction to include oracy and metalinguistic development, as well as reading and writing. These innovations are so new and so different that they necessitate a focus on a comprehensive approach to professional development and technical assistance. Given that Literacy Squared is meant to have a cumulative effect across grade levels and that this impact is enhanced with high levels of implementation, it was important to understand levels of implementation at the classroom, as well as school levels.

Fidelity of implementation data were gathered from a variety of sources including: (a)

daily schedules; (b) attendance at professional development sessions; (c) lesson plans for Spanish literacy and literacy-based ESL (two times during the year); (d) students' Dictado notebooks; and (e) classroom observations of each designated Literacy Squared teacher.

As with the previous two years of the case study, the 2011-2012 school year demonstrated great variability in levels of implementation of Literacy Squared. None of the schools had 100% of their teachers doing full implementation. For example, at CMS none of the teachers fulfilled all of the requirements to be considered a full implementer. At Columbine, there were only two teachers who fulfilled all of the requirements to be full implementers; however, more were meeting minimum requirements. We noted inconsistencies in implementation in Spanish literacy at the intermediate grades in Denver, and inconsistencies in the implementation of literacy-based ESL in both Boulder and Denver at the primary grades.

Over the course of this case study, we have learned there is still a great amount of work to do with regard to fidelity of implementation. At issue, more than ever, are the tensions between district curricula and reading programs and the Literacy Squared requirements. Further, a study by Literacy Squared researchers completed in April 2012 (Sparrow, Butvilofsky & Escamilla) established statistically significant reading and writing outcomes for teachers who are high implementers of some of the Literacy Squared curricular requirements. In short, fidelity of implementation is important, as it helps children's biliteracy achievement. However, achieving high levels of implementation in classrooms and schools remains a challenge to the project.

Students' Biliteracy Outcomes

The fourth purpose of this study was to report research findings related to participating students' outcomes in Spanish and English reading and writing from 2009-2012, and to examine

results vis-à-vis trajectories toward biliteracy. Section 4 of this report details student outcomes in aggregate form and disaggregated by school.

Phase II of the Literacy Squared Project followed students through the initial stages of literacy development in Spanish and English. Four separate grade level cohorts of students across three grades were followed in the second phase of the study.

Research questions addressed for Year 3 include:

1. What gains in Spanish and English reading achievement were made by Cohorts I-IV from Years 1 to 3 of Phase II as measured by the EDL2 and DRA2?
2. How did the biliterate writing skills of students in Cohorts I-IV develop from Year 1 to Year 3 of Phase II as measured by the Literacy Squared® Writing Rubric?
3. What were third, fourth, and fifth grade student outcomes on the 2012 TCAP?
4. What percentage of students at each grade level ended the year with reading achievement levels that reflect benchmark biliteracy zones?

Overall, results were positive in that cohort groups made positive growth in both Spanish and English reading and writing over the course of the case study. On average, students grew almost a full year for each year of the study in both Spanish and English reading. Growth in Spanish reading was greatest (1.4 years) from kindergarten to first grade, and the greatest gains in English reading occurred from fourth to fifth grade (1.5 years). Of particular interest are the students who received paired literacy instruction starting in kindergarten (Cohort I). The data for this cohort indicate the acceleration of Spanish and English reading outcomes at the end of first and second grade. The findings indicate, especially in English, that as students receive instruction in both Spanish literacy and literacy-based ESL starting in kindergarten, their reading

skills in both languages are accelerated and it is more likely they will be in the Grade Level Benchmark Biliterate Reading Zones.

With regard to writing outcomes, Research Question 2, findings demonstrate growth for all cohorts in Spanish and English. Similar to findings in reading outcomes, the sooner students received paired literacy instruction, the higher their writing scores.

Research Question 3 examined student outcomes on the Colorado state 2012 TCAP assessment. The TCAP reports the percentage of students at each proficiency level by grade and subject area (ranging from Unsatisfactory to Partially Proficient to Proficient to Advanced). Fifty eight percent of the third grade students participating in Literacy Squared in Colorado scored proficient or advanced in Spanish reading (*Lectura*), and 66% were proficient or advanced in Spanish writing (*Escritura*). These outcomes were lower than in previous years of the case study. This trend, however, was noted statewide as the TCAP was a new assessment created to replace the previous state assessment (CSAP). It was changed to support the new State standards; and any comparison to the previous achievement levels should be made with caution. The percentage of fourth and fifth grade students scoring proficient or advanced on English reading also decreased in Year 3; however, there was a slight increase in achievement in English writing outcomes for fourth graders.

The last research question documented the percent of Literacy Squared students reaching the grade level benchmark biliteracy zones for Grades 1-5. For students in the Literacy Squared aggregate, the percentage of students within the grade level benchmark biliteracy zone increased from Years 1 to 3 for all grades with the exception of third grade. We are aware that at one school there was a low level of fidelity to the biliteracy model in the third grade. This had an effect on students' achievement. Longitudinal results also indicate that starting paired literacy

instruction in kindergarten has a direct relationship with an increased number of students in the grade level benchmark biliteracy zone in second grade.

When examining the biliteracy outcomes of students that were in classrooms with high implementers, we noticed accelerated gains in both Spanish and English literacy development. In general, with moderate levels of implementation, we learned that students make at least one year's growth in Spanish and English reading. With high implementers, however, we have observed gains of 1.4 years in each language. This is demonstrative of the potential in accelerating students' trajectories toward biliteracy. Unfortunately, we did not observe this rate of acceleration two years in a row. The increase in the percentage of students in the Grade Level Benchmark Biliteracy Zone in almost all grades for the case study, demonstrates the potential of the Literacy Squared model.

In sum, student outcomes in reading and writing in Spanish and English showed positive growth in the third year of this project. It is significant to note that the addition of Literacy Squared kindergarten classrooms has had a very positive impact on Phase II results. Again, the researchers are hopeful that results could be even more impressive if higher levels of implementation could be achieved.

Implications and Recommendations

Overall, Literacy Squared Phase II: Colorado Case Study has been a tremendous learning experience. The primary purpose for the case study in Colorado was to understand the association between fidelity of implementation of the Literacy Squared model and the biliteracy achievement of emerging bilingual children. Through our collaboration with the various teachers, leaders, and children at the schools, we learned ways in which to change and improve the biliteracy model in order to increase emerging bilingual students' biliteracy achievement, and

we learned of some of the challenges that face our schools that prevent them from implementing with fidelity.

In regards to the association between fidelity of implementation and students' biliteracy outcomes, our data reveal a relationship between the two, thus indicating the potential of the biliteracy model. To ensure fidelity and maximize the potential of the Literacy Squared, we recommend the following:

- The elimination of competing literacy programs.
- Maintaining consistency in programming and curricula.
- Greater attention and coaching to teachers who have not mastered all the instructional components. This is especially important at the third grade as students who have received paired literacy instruction since kindergarten need to sustain and continue to accelerate their biliterate development.
- The continuation of paired literacy instruction beginning in kindergarten, and maintenance through fifth grade.
- More partnering of Literacy Squared researchers with teachers to co-construct and teach lessons using the gradual release of responsibility framework.
- Providing teachers opportunities to plan together. This is especially important in contexts where two teachers provide students literacy instruction in different languages.
- Increased alignment of classroom observation criteria so that teachers continue to hone their skills through coaching. Principals and administrators should use the same criteria or "look fors" the biliteracy project does.
- Increasing teacher attendance and participation at general professional development

sessions.

- Providing half-day professional development session more frequently instead of full-day sessions.
- Administrators and teachers should examine the new state standards (Common Core State Standards; WIDA ELD Standards) and the new assessments (e.g. ACCESS) to inform instruction.

By way of summary, it is important to reiterate that in its totality, Literacy Squared is innovative in ways that make it quite different from current approaches to either bilingual or dual language education. We are learning that it will take time and focus to ensure fidelity of implementation. In this regard, it may be that the concepts in Literacy Squared are so novel that it takes more intensive on-site assistance in order to maximize implementation of the instructional component. Concomitantly, it is also important that we secure additional assurances from schools that there will be a reduction of extraneous programs to ensure that Literacy Squared can be fully implemented across grade levels.

The research team welcomes an opportunity to meet and discuss the contents and implications of this report and wishes to assure our school sites that our efforts in this project are collaborative. We must work together if we are to succeed.

Technical Report

This technical report represents Year 3 of the second phase of a research partnership between the University of Colorado, the Boulder Valley School District (BVSD), and the Denver Public School District (DPS). Research results reported herein represent the final year (2011-2012) of Phase II of the Colorado Case Study and include longitudinal results from the three years of the study.

This report is organized into four sections. The first section provides a description of Literacy Squared Case Study in Colorado. Section two provides a description of the Colorado school sites as well as details related to the professional development and on-site support given. The third section details the various measures used to assess fidelity of implementation and an analysis of fidelity at the research sites. The report concludes with research results related to participating emerging bilingual students' longitudinal biliteracy outcomes on Spanish and English reading and writing measures and the state's high stakes literacy exams.

Section 1: Literacy Squared Colorado Case Study

In 2005, the University of Colorado entered into a research project with six elementary schools in the Denver Public Schools and one elementary school in Boulder Valley Schools. This project titled, Literacy Squared® completed its first phase in the spring of 2009. The purpose of Phase I of the Literacy Squared research project was to improve Spanish-English emerging bilingual learners' literacy achievement by providing paired literacy instruction in Grades 1-5 and testing a hypothesis related to the development of trajectories toward biliteracy. In other words, the researchers wanted to understand how emerging bilingual students would develop their Spanish and English reading and writing abilities as they received literacy instruction in

both Spanish and English starting in first grade. Since its inception, Literacy Squared has had four main components:

1. Research which includes data collection and analysis
2. Assessment in two languages with refinement of holistic assessment practices in reading and writing in Spanish and English
3. Professional development for leadership and teachers
4. Comprehensive Biliteracy Instructional Model with a focus on oracy, writing, reading, metalanguage, and cross-language connections in both Spanish literacy and literacy-based ESL.

Phase I of Literacy Squared revealed very positive results and great potential. As such, we decided to proceed with the project in a more limited way and created Phase II, which included three case study schools and began paired literacy instruction in kindergarten. Three schools from Phase I of the study were selected to participate in Phase II, which began in the fall of 2009. There were several purposes for the case-study inquiry in Colorado including:

1. To examine whether or not there is an association between fidelity of implementation of the Literacy Squared® biliteracy model and the biliteracy achievement of emerging bilingual learners.
2. To explore if biliteracy outcomes improve for students who have experienced teachers who are high implementers of Literacy Squared across grade levels in order to understand longitudinal biliteracy outcomes.
3. To better understand how professional development may also be linked to improvement in levels of implementation.

4. To continue to examine students' longitudinal achievement in Spanish and English reading and writing from 2009-2012, and to examine results vis-à-vis trajectories toward biliteracy.

Description of the School Sites

Two elementary schools in Colorado participated in the third year of this study: Charles M. Schenck Community School (CMS) in DPS, and Columbine Elementary in BVSD. The third school, Valverde Elementary in DPS, withdrew from the Colorado Case Study for the last year of the project due to a change in administration. Student demographics for both CMS and Columbine are represented below in Table 1.

Table 1. Colorado Case Study School Demographics 2011-12

School	Population	%Latino	%White	%ELL	%FRL
CMS	649	85	9	75	91
Columbine	397	80	16	65	71

As can be seen, the participating schools are highly segregated, in that over 80% of the students are Latino, over 70% of students qualify for free or reduced priced lunch (FRL), and the majority of the student population is labeled as English language learners (ELLs).

CMS Elementary. In the 2011-12 school year, CMS Elementary had 24, K-5th grade classrooms and three distinct models/strands to serve their ELL population: (a) Literacy Squared model with one classroom at each grade level; (b) Spanish-English dual language program that used the Literacy Squared framework to organize and plan literacy instruction with two classrooms at each grade level; and (c) English mainstream educational model (ELA-E) with an English Language Development component for ELLs with one classroom at each grade level.

It is important to note that in the fall of 2011, CMS Elementary was rated "Red" and placed on probationary status by DPS based on outcomes from 2010-2011. The rating is the

result of the DPS district's School Performance Framework (SPF), an indicator summary that publically ranks the district's schools primarily on achievement and growth on the state assessment program. The implications of this "red" rating involve unfavorable effects on schools including enhancement in current programming, replacing school leaders and/or staff, or the replacement of the existing school with a new school. At CMS, the effects of this rating included added pressure on the teachers and school leadership, which included additional observations and evaluations; changes in educational programming with the inclusion of a test-taking curriculum in the intermediate grades; and increased pressure to teach in English. This mandate directly contradicted the research and theoretical underpinnings of Literacy Squared.

Columbine Elementary. Columbine's staff and students moved into a new building with state of the art facilities and technology for the 2011-12 school year. With the new building came changes in programming. The major change in programming involved the implementation of the "Trio" model, or a two-way dual language program for all students at Columbine, including monolingual English speakers. The goal of the program is for all students to learn Spanish and English during the literacy block. To implement the "Trios" (Miramontes, Nadeau, & Commins, 2011) two-way dual language program, students were grouped by language in three ways: native language (L1), second language (L2), and integrated group instruction: (a) during L1, students were grouped together to receive instruction in their native/home language (e.g. Spanish literacy, English literacy); (b) during L2, students were grouped together to receive instruction in their second language (literacy-based ESL; literacy-based Spanish as a second language); and (c) during integrated time, students were grouped heterogeneously to learn content in English. This new configuration also required providing more focused professional development and on-site

support on the Literacy Squared model to more teachers than in previous years (read more about this in "Teachers," in Section 2).

Section 2: Maximizing Fidelity of Implementation: Professional Development and On-site Support

Professional development is a major component of Literacy Squared and it is provided for leadership (principals, literacy coaches, and school site coordinators[1]) and teachers implementing the Literacy Squared model. The Literacy Squared Comprehensive Biliteracy Instructional Model contains several significant changes from more traditional bilingual or dual language programs including paired literacy instruction; literacy-based ESL; and an expanded view of literacy instruction in two languages including greater emphasis on oracy, writing, metalinguistic awareness, and cross-language connections, all of which make the role of professional development critical to successful implementation of the biliteracy instructional model. Professional development is provided to K-5 teachers, and thorough implementation of the model across grade levels is critical to students' development of trajectories toward biliteracy.

Moreover, professional development in Literacy Squared is an iterative process and done as a means of giving and getting feedback on successes and challenges in implementing the biliteracy model. Venues for professional development have included: bringing together all research schools; on-site and classroom observations; school specific professional development; and individual classroom modeling, co-teaching, coaching, and assistance. Each type of professional development advances a different level or type of awareness for Literacy Squared participants.

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[1] The site coordinator serves as a liaison between the school and the research team. The site coordinator provides teachers with support in implementing the Literacy Squared model, and assists the research team in collecting data.

School Leadership

CMS Elementary. Since the inception of the Literacy Squared Project in 2005, Ms. Kristin Nelson-Steinhoff has served as the principal at CMS Elementary. She has a master's degree in curriculum and instruction from the University of Colorado Denver, and she is bilingual in Spanish and English.

Ms. Nadia Madan Morrow served as the site coordinator (.5 FTE) at CMS since the 2007-08 school year. In the 2006-07 school year, she was a Literacy Squared first grade classroom teacher. Ms. Madan Morrow is bilingual, has a Master's degree in bilingual education and an endorsement in linguistically diverse education. She had 12 years of teaching experience, all of them at CMS Elementary. While serving as the site coordinator for Literacy Squared, Ms. Madan Morrow was also the school's literacy coach, providing literacy instructional support to all of the classroom teachers at the school.

Columbine Elementary. In the 2010-11 school year, Mr. Guillermo Medina became the principal at Columbine Elementary. Prior to assuming the leadership position at Columbine, Mr. Medina, a native speaker of Spanish, spent six years in leadership positions at a bilingual elementary school in Northern Colorado. Three of those years he served as the assistant principal and three as principal. In his second year serving as principal, Mr. Medina has brought renewed leadership to the school, and support for the Literacy Squared biliteracy project at the school.

Mr. Jorge Rodríguez served as Columbine's site coordinator (.5 FTE) after having been a teacher participant in Literacy Squared beginning in year two of Phase I. Jorge also taught fifth grade literacy in the afternoons. This dual commitment meant that he was only able to observe and coach those teachers who had morning literacy blocks. In addition, however, this dual role also meant that he was able to coach teachers and apply Literacy Squared strategies

simultaneously. To support changes in programming and to ensure that all cooperating teachers had support, a teacher at each grade level was selected to serve as a Literacy Squared team leader. Team leaders were identified as "experts" in Literacy Squared and were able to provide leadership during grade level planning around biliteracy instruction.

Teachers

Participants in the research study included kindergarten through fifth grade Literacy Squared teachers in each of the schools. Table 2 shows an overview of Literacy Squared teacher characteristics.

Table 2. Literacy Squared Teacher Demographics, 2011-12

	Total in CO	CMS n/%	Columbine n/%
Total Number Participants	27	6	21
Gender			
Female	24	6/100	18/86
Male	3	0	3/14
Ethnicity			
Latino	15	5/83	10/48
White	11	1/14	10/48
African Am.	0	0	0
Not reported	1	0	1/4
Teaching Experience			
0 – 5 years	8	4/67	4/19
6 -10	1	0/0	1/5
More than 10	18	2/33	16/76
Teaching Experience at Current School			
0 – 5 years	8	4/67	4/19
6 -10	14	1/17	13/62
More than 10	5	1/17	4/19
Not reported			
Master's Degree	19	3/50	16/76
LDE Endorsement	20	3/50	17/81
Bilingual	20	6/100	14/67

Teacher characteristics in the research schools are both similar and different than teachers in bilingual programs nationally. They are similar to other schools nationally in that the majority

are female and have been teaching less than five years (this is especially true for schools that have populations with low socioeconomic status). This means that they are quite inexperienced. They differ in that in each school, 55% of the Literacy Squared teachers have Master's degrees, the majority is Latino, and most teachers included in this report are Spanish-English bilinguals.

Contextualizing teacher demographics, including ethnicity, teaching experience, and levels of education, can provide a more nuanced understanding of how these factors can influence fidelity of implementation, which was one of the main purposes of conducting the second phase of the Literacy Squared research project in Colorado.

CMS Elementary. While CMS Elementary had the largest student population, only six teachers participated in the actual biliteracy research study. Eighty-three percent of the teachers self-identified as Latina, and three teachers (50%) reported having a Linguistically Diverse Endorsement. It is noteworthy that 67% of teachers had less than five years of teaching experience. The second grade teacher was completely new to the project, three teachers had participated in Year 2 of the study, and the first and fifth grade teachers had been part of Phase I of the research project. Over the course of the case study, there was high teacher turnover in the Literacy Squared strand within the school. Many teachers who had received professional development from the first phase of the project were not part of the case study, and after the first year of Phase II, three of the five teachers were moved to the dual language strand within the school. In Year 2, three teachers, new to teaching and Literacy Squared were placed in Literacy Squared classrooms. Such shifts in teachers, especially when professional development is so valuable to the instructional model, complicates the implementation of the biliteracy model. Rather than using the multi-year opportunity of professional development to deepen

understandings of the biliteracy model, teacher turnover resulted in many teachers only ever receiving a one-year understanding.

Columbine Elementary. Although Columbine has lower student enrollment than CMS, it had more than three times as many teacher participants, totaling 21. There was an increase in teachers at Columbine in the third year of the case study because the "Trios" two-way dual language model was incorporated as the bilingual program within the school. The dual language program's purpose is to serve both Spanish-English students, as well as monolingual English speakers wanting to learn within a bilingual program. As such, monolingual English teachers were assigned to teach literacy-based ESL to Literacy Squared participants at all grade levels. Thus, many students received Spanish literacy and literacy-based ESL from two teachers. There was one teacher at each grade level that was self-contained in that he/she taught both Spanish literacy and literacy-based ESL. Dividing the literacy block among two teachers lessened the likelihood that teachers could hold students accountable for what they knew and could do in the partner language since they were unlikely to witness it. Forty eight percent of the teachers self-identified as Latino/a and 76% had over six years of teaching experience. Columbine teachers also had 81% of teachers reporting having a Linguistically Diverse Endorsement.

Professional Development

Teacher professional development sessions. As in prior years of Phase II of the research project, CMS and Columbine had slightly different professional development for teachers, as the strengths and needs between schools were distinct. Both schools received an equivalent of two and one-half days of professional development (total of three sessions) relevant to the Literacy Squared model during the 2011-12 school year. These sessions were organized and developed by the Literacy Squared research team. While fewer professional

development sessions were provided in Year 3 than in Years 1 and 2, the amount of on-site support increased beyond four days (see section, "Site-specific support" for more). Table 3 provides the dates, locations, attendees, and topics covered at these professional development sessions.

Table 3: Professional Development Sessions, 2011-12

Date/Time	Location	Attendees	Topics Covered
Aug. 11 8:30-11:30 am	CU Boulder	Columbine & CMS (only site coordinator from CMS attended – conflict with schedule) 43 in attendance	• Calendar, Roles & Responsibilities, Review Time Allotments & Pedagogical Approaches (Butvilofsky) • Dictado Research and Implications (Cano-Rodriguez & Butvilofsky) • Work time and share out (Butvilofsky)
Sept. 19 8:30-11:30 am	CMS Elementary	CMS (all classrooms teachers including ELA-E) 51 in attendance	• EDL2/DRA2 data: Creating a profile and establishing an instructional focus (Ruiz-Figueroa) • From the SEP materials to Literacy Squared: 5th grade Expository Lesson Demonstration (Butvilofsky & Sparrow)
Nov. 10 8:30-11:30 am	CMS Elementary	CMS 19 in attendance	• Overview of the *Literacy Squared® Observation Protocol* (Butvilofsky & Sparrow) • View video of 5th Grade Literacy Squared instruction/Complete *Observation Protocol* (Butvilofsky) • State of Literacy Squared at CMS: Where do we go from here? (Escamilla & Butvilofsky)
Jan. 3 8:30-11:30 am	Columbine Elementary	All Columbine teachers 33 in attendance	• Importance of making cross-language connections in the dual language context (Hopewell) • From the SEP materials to Literacy Squared: 5th grade Expository Lesson Demonstration (Butvilofsky & Sparrow)
April 21 8:00 am-3:00 pm	CU Boulder	CMS and Columbine Teachers 35 in attendance	• Establishing inter-rater reliability with the Literacy Squared Writing Rubric (Butvilofsky & Sparrow) • Scoring students writing samples

Site-specific support. In addition to the teacher professional development sessions, each school had a Literacy Squared research liaison that provided site-specific support to the school. This was unique to the second phase of the biliteracy model and research project. Sandra Butvilofsky and Olivia Ruiz-Figueroa provided support to CMS, and Olivia Ruiz-Figueroa was assigned to Columbine. The research liaisons worked closely with the school's Literacy Squared site coordinators to assist in ensuring teachers at each school had a working knowledge of the

various components of the Literacy Squared model. As such, support provided at each school was different and is reported independently below.

CMS Elementary. In addition to providing Literacy Squared teachers with support, for Year 3 of Phase II, CMS requested Literacy Squared professional development and on-site support for teachers in the English-only (ELA-E) strand. Olivia Ruiz-Figueroa provided support to the ELA-E teachers, while Sandra Butvilofsky did so for the Literacy Squared teachers. On-site support included: observing teachers and providing feedback; lesson planning; modeling and co-teaching biliteracy/literacy-based ESL lessons; explaining the biliteracy model; and discussing levels of implementation. More support was given to the second, fourth, and fifth grade teachers within the Literacy Squared strand. This occurred because the second grade teacher was new to teaching and to Literacy Squared, and higher levels of Spanish literacy implementation were needed at the fourth and fifth grades. The site coordinator, school's literacy coach, and area Teacher Effectiveness Coach (TEC) accompanied the research liaisons to most meetings and observed most demonstration lessons. Literacy Squared teachers received 15 days of on-site support as illustrated in Table 4, and ELA-E teachers received seven days of support as indicated in Table 5.

Table 4. On-Site Support CMS for Literacy Squared Teachers, 2011-12

Date	**Activities**
Aug 19 11:00-1:00 (2 hours)	Meeting with Site Coordinator
Sept 2 8:00-12:00 (4 hours)	Plan with 2nd and 5th grade teachers with Site Coordinator
Sept 6 8:45-3:00 (6 hours)	9:00 -10:00 Plan with 5th grade teacher 10:40-1:00 Model Spanish Literacy & Lit-based ESL in 2nd grade 1:15-2:45- Model in 5th grade Spanish Literacy
Sept 7 9:00-2:30 (5.5 hours)	9:00 CMS Plan with 5th grade teacher 10:40-1:00 Model and co-teach in 2nd grade: 1:15-2:45Model and Co-teach in 5th grade
Sept. 9 10:00-3:30 (5.5 hours)	10:30-1:00 Co-teach in 2nd grade - Spanish Literacy & Lit-based ESL 1:15-3:30 Co-teach in 5th grade: Spanish Literacy & Lit-based ESL
Sept 12 12:00-3:45 (3.75 hours)	12:15-3:30 Plan and Co-teach in 5th grade: Spanish Literacy & Lit-based ESL
Sept 13 12:00-3:45 (3.75)	12:30-1:00 Meet with 5th grade teacher & Site coordinator 1:15-3:30 - Co-teach in 5th grade: Spanish Literacy & Lit-based ESL
Sept 21 12:00-3:45 (3.75)	12:15-3:30 Plan and Co-teach in 5th grade: Spanish Literacy & Lit-based ESL
Oct. 6 11:45-1:45 (2 hours)	Lunch Mtg w/ Principal, Site Coordinator, & Kathy Escamilla to discuss status of project
Oct. 17 1:30 -3:45 (2 hours)	Meet w/ kinder teacher to plan co-teaching of Spanish literacy week of Oct. 24 1:45 - 2:45 5th grade class – recap student learning; collected artifacts from lesson
Nov 21 1:00-3:45 (2.75 hours)	Planned with Kinder and 4th grade teachers
Nov 28 8:30-1:45 (5 hours)	Co-teach with Kinder teacher – shared reading lesson in Spanish, observed Spanish literacy, planned for subsequent lessons and workstations. Planned with 4th grade teacher
Nov 30 8:30-3:45 (7 hours)	Co-teach/plan with Kinder and 4th grade teachers 8:30-11:45 Kinder: modeled shared reading/modeled writing; modeled center activity related to shared reading; monitored student centers 12:15-2:00 4th grade: planned; co-taught Spanish literacy lesson on persuasive argument. 2-3 Met with Site Coordinator 3:00-3:45 party in 5th grade classroom to celebrate end of unit
Dec 8 8:30-1:30 (5hours)	Follow-up with kinder – schedule change; 45 minutes of small group instruction Collect class lists and scheduled future visits
Jan. 9 10:15-4:30 (6.25 hours)	10:45-11:45 Observe 3rd grade 12:30-1:00 Meet with 1st grade teacher 1:00-2:00 Observe 1st grade 3:00-4:15 Met with 3rd grade teacher
Jan 10 (3 hours)	(3rd grade class is on a field trip) 10:00-11:00 Observed in 1st grade classroom 11:00 –11:45 Model poem writing in 3rd grade class 11:30-12:15 Meet with 1st grade teacher 12:15-1:00 met with Site coordinator
Jan 12	Cancelled due to 3rd grade teacher's schedule and CELA testing; 1st grade teacher did not want more assistance
Jan. 25, 7:45- 9:00	Debrief team site visit with staff
April 19 (1 hour)	Dr. Manuel Escamilla met with 4th grade to go over "*Que chiste*" lesson, he also met the students and talked with them about what they were going to do
April 30, May 1-3 & 7 (Total of 12 hours)	Dr. Manuel Escamilla modeled "*Que chiste*" lesson in 4th grade class On May 7, Manuel and 4th grade teacher debriefed the lesson

Table 5. On-Site Support CMS for ELA-E Teachers, 2011-12

Date	**Activities**
Sept. 22, 2011 8:00-11:30 am (3.5 hours)	Set up observation & co-teaching of lesson with ELA-E teachers in Grades 2-5 Met with Site Coordinator and principal
Oct. 10, 2011 10:00-4:00 (6 hours)	Met with teachers in Grades 2-5 Ta debriefed plan for modeled lesson 3rd grade teacher was absent Observed 4th grade teacher and planned to do a literacy lesson 5th grade teacher was not aware of meeting, thus only met for 10 minutes
Oct. 13, 2011 8:30-11:30 (3 hours)	Modeled lessons in 2nd, 4th, and 5th Grades. Debriefed lessons with 2nd and 5th grade teachers. Met with 3rd grade teacher just to become familiar with the students and classroom.
Nov. 7, 2011 10:00-4:00 (6 hours)	Met with 3rd grade ELA-E teacher to observe. S 3rd grade ELA-E teacher, literacy coach- modeled lesson for the next day Observed 5th grade and debriefed observation.. Met with literacy coach to plan lesson for next day
Nov, 8, 2011 8:30-11:30 (3 hours)	Modeled a Lit-based Reading Lesson w/lowest reading group with a focus on Oracy in 3rd grade class. Oral reading for fluency; practice on HFWs; Dialogue; Sentence Frames Debriefed with 3rd grade ELA-E to get feedback, problem-solves on changing reading group table to a different place in the classroom. Met with Literacy Coach and the Site Coordinator about observations and lessons. Met w/Literacy Coach for January plans.
Jan. 9, 2012 9:00-4:00 (6 hours)	9:00 Met with School TEC and Literacy Coach re: schedule 10:00 Met with ELA-E grade 5 T and Literacy Coach to discuss teaching points regarding summary writing 11:00 Olivia plans w/ ELA-E gr. 2 teacher a guided reading lesson 12:30 Met with ELA-E Gr. 5 Teacher and TEC to plan a summary writing lesson 1:30 Lunch/ Olivia prepares lessons 2:30 Olivia models with a whole group summary writing lesson for ELA-E Gr. 5 T 3:00 - Olivia plans a guided reading lesson with ELA-E Gr. 3 teacher
Jan. 12, 2012 8:30-11:30 (3 hours)	8:30 Olivia meets with Literacy Coach re: schedule and debrief 9:30 Olivia co-teaches/ observes ELA-E Gr. 3 teacher in the guided reading lesson 10:00 Olivia debriefs lesson w/ ELA-E Gr. 3 teacher (TEC covers class) 10:30 Olivia co-teaches/ observes Amber in the guided reading lesson 11:00 Olivia debriefs w/ Amber (Literacy Coach covers Ambers class) 11:30 Olivia debriefs w/ Literacy Coach and Lupe
Feb. 27, 2012 10:00-4:00 (6 hours)	Spent the entire day with 3rd grade ELA-E and ELA-S teachers. Planned for rest of year, looked at assessment; reviewed guided reading instruction, and prepared to do modeled lessons in both classrooms.
Mar. 1, 2012 8:00-11:30 (2.5 hours)	8:00-9:00– Debriefed with Site Coordinator and 3rd grade ELA-E/S teachers. Planning for 3rd grade ELA-S students since teacher would be leaving during Spring break for rest of school year. Students would have to transition to English Reading since substitute does not speak Spanish. Plans for Reading teacher to work with small group in Spanish who are not ready to take on only English. 9:15-10:00 – Modeled Lesson in 3rd Grade ELA-E/S teachers, Reading Teacher, Site Coordinator, Literacy Coach, and principal. 10:15-11:00 – Modeled Spanish Reading lesson in 3rd grade ELA-S classroom with Reading Teacher, and Site Coordinator. 11:00-11:30 – Debriefed Lessons

Table 6. On-Site Support Columbine Elementary, 2011-12

Date	Activities
September, 20, 2012 10:00-4:00 (6 hours)	Site Coordinator, Teacher 1-D*, Teacher 1-B1, Teacher 1-B2, and reading interventionist • Met with Teacher 1-D and reading interventionist to debrief needs in first grade • Observed Spanish Literacy lesson with other 1st grade teachers, Teacher 1-D & SC • Debrief w/ First grade teachers on Lessons • Met w/ 1st grade teachers to plan for modeled lesson
September 21, 2011 8:30-3:30 (6 hours)	Site Coordinator, Teachers 1-D, K-C2, K-C1, K-B2, Mr. Medina, and Ms. Trompeter • Observed Kinder classrooms • Met w/Kinder Teachers during lunch to discuss areas of need • Modeled a 1st grade Lit-based ESL lesson w/both 1st/Kinder teachers observing • Debriefed with teachers after lesson • Met w/ principal and VP to discuss my role in working w/Columbine this year.
October 11, 2012 9:00-4:00 (7 hours)	Teachers 3-C1, 2-B2, 2-C, 1-D and Site Coordinator • Observed 2nd grade classes to become familiar w/ students, content, context • Worked w/ Teacher 1-D on assessment of kinder student • Debriefed w/ 2nd grade teacher to prep for lessons next day • Had Teacher 2-B1work with students in Spanish to support Lit-Based lesson
October 12, 2012 10:00-4:00 (6 hours)	2nd grade team, Site Coordinator, and AP • Modeled Lit-Based ESL Lesson w/ focus on writing for 2nd grade w/ 2nd grade staff • Modeled a Spanish Literacy Lesson w/focus on writing in 2nd grade classroom • Debriefed w/2nd grade team and Site Coordinator • Met w/ Pre-K Team to begin discussion of Lit Squared extending to Pre-K.
November 9, 2011 8:30-3:30 (6 hours)	Site Coordinator, Teachers 3-C1, 1-D, 1-C2, 1-B2 • Observed 2 first grade teachers w/a Lit Based ESL Lesson • Debriefed w/ 1st grade lessons • Observed Pre-K classroom • Met w/ Pre-K teacher to discuss Oracy Activities
November 10, 2012 10:00-4:00 (6 hours)	Site Coordinator, Teachers 3-C1, 1-D, Pre-k, and 2-C • Observed Teacher 2-C w/a Lit-based lesson • Debriefed w/ Teacher 2-C on her lesson • Observed 3rd grade teacher classes • Met w/1-D and Site Coordinator on January Schedule
Jan. 10, 2012 9:00-2:30 (5.5 hours)	Kindergarten team worked on Lit based ESL
May 7, 2012 12:00-4:00 (4 hours)	12:00-1:00pm – Meeting w/ Teacher 3-C1 for 3rd Grade Lotta Lara 1:15-2:45 – Met w/ Teacher 5-C1 for pre-planning for Lesson w/students 2:45-4:00 – Planning of lessons of Lotta Lara
May 8, 2012 8:30- 4:00 (7.5 hours)	8:40-9:45- Observe 5th grade Teacher 5-C1- Spanish literacy 9:45-11:05- Observe 5th grade Teacher 5-C2- Lit based ESL 12:45-1:30 - Model Lotta Lara 3rd Grade - 1:30-2:15 - Observe Teacher 1-C2 to get ideas on what to each next day. 2:15-4:00 – Lesson Planning for Modeled Lessons
May, 9, 2012 9:40-4:00 (6.25 hours)	9:40-11:05 - Model 5th Grade Lit based ESL with teachers 5-C1 and 5-C2 11:15-11:45 – Debrief w/ 5th grade team 12:30- 1:15 – Planning w/1-D 1:30-2:15 - Model 1st Grade ESL w/Teachers 1-B2 and 1-C2 2:15- 3:30 - Debrief Lesson w/ Teachers 1-B2, 2-C2 and 1-D, then discussed plans/needs for 2012-13 School year for Kinder and 1st grade 3:30-4:00 – Met w/principal for a quick debrief of visit and possible plans for next year.

*Codes are used to protect participating teachers' identities

Columbine Elementary. Columbine received eleven days of on-site support from Olivia Ruiz-Figueroa. Support was provided via meetings, modeling of lessons, and planning for instruction from ECE through fifth grade. A major focus for the on-site support at Columbine was on ensuring cooperating teachers at each grade level who taught the literacy blocks separate from one another understood how to connect the language environments, in order to capitalize on students' strengths, make cross-language connections, and teach to students' potential. Because most teachers teaching literacy-based ESL are monolingual English speakers, the Spanish literacy teachers had to ensure attention was made to explicit cross-language connections. Table 6 provides greater detail of support provided.

Section 3: Report of Individual Project Teachers' Adherence to the Implementation of the Literacy Squared Model

Fidelity of Implementation

Examining fidelity of implementation is a critical aspect of the Literacy Squared model. "Fidelity of implementation" represents the degree to which teachers and program providers implement programs as intended by program developers (Dusenbury, Brannigan, Falco, & Hansen, 2003; Mowbray, Holter, Teague, & Bybee, 2003; Ruiz-Primo, 2006). The Literacy Squared model provides leadership and teachers with a variety of parameters to ensure the program model is implemented as intended. The specific parameters are explicated in the Literacy Squared training manual (Escamilla, Soltero-González, Butvilofsky, Hopewell, & Sparrow, 2009a) and through professional development sessions and on-site support. Specific expectations for schools implementing the Literacy Squared Model were set forth in the Roles and Responsibilities for Site Coordinators (Appendix A) and Teachers (Appendix B) which were presented to participants at the beginning of Year 3 of Phase II of the study.

Similar to Years 1 and 2, during the third year of Phase II of the research project, various data sources were used to ensure teachers were implementing certain aspects of the Literacy Squared model as intended. These data sources included:

1. Teachers' schedules to see the degree to which they reflected the Literacy Squared Comprehensive Biliteracy Instructional Model
2. Attendance at Literacy Squared professional development sessions
3. Collection of Literacy Squared lesson plans for two different weeks from the academic year
4. Collection of students' Dictado notebooks
5. Literacy Squared research team's observations of teachers' instruction.

Data Sources

Schedules. Daily schedules were collected to ascertain whether teachers were scheduling the required amounts of Spanish literacy and literacy-based ESL into their daily instruction as part of the Comprehensive Biliteracy Instructional Model. We would like to note here that even though a teacher may provide us with a schedule, it is not a guarantee that students are receiving the minimum time requirements daily.

Attendance at professional development sessions. Attendance was taken at each of the three professional development sessions.

Lesson plans. Teachers were to submit lesson plans utilizing the *Literacy Squared Lesson Plan Framework* two times in Year 3. The submission of lesson plans provided insight into whether teachers' were implementing Spanish literacy and literacy-based ESL, connecting the language environments, and utilizing the various recommended pedagogical approaches at

each grade level (see Escamilla et al., 2009a, pg. 68). The research team provided written feedback to teachers on all lesson plans submitted.

Dictado notebooks. The Dictado was intended to be a minor method to be used in the implementation of the Comprehensive Biliteracy Instructional Model component in Literacy Squared classrooms. This method is taught within Spanish literacy and literacy-based ESL in order to make cross-language connections (in Grades 1-5). While it is primarily a writing method, it can also be used to teach oracy, metalanguage, and reading. The Dictado teaches language arts' conventions in an integrated way in both languages, and it ultimately builds metalinguistic skills regarding differences and similarities between the written orthographic systems. It is widely used in Central and South America, and was adapted for use in Literacy Squared (for more on this method, see Escamilla, Geisler, Hopewell, Sparrow & Butvilofsky, 2009b). Participating teachers are directed to implement it at least three days a week for 15-20 minutes a day, rotating weekly between Spanish and English. By the year's end, it is expected that students in kindergarten will have completed 12 Dictados in Spanish; students in first grade must have completed 15 Dictados in Spanish and 12 in English; and students in Grades 2-5 must have completed 15 Dictados in each language. To collect data on Dictados, teachers were asked to submit Dictado notebooks from four randomly selected students.

Literacy Squared observations. The Literacy Squared research team formally observes all Literacy Squared teachers once per year. Observations last 30-90 minutes in Spanish literacy and literacy-based ESL. Research pairs wrote field notes about observations of classroom instruction and used the *Literacy Squared Observation Protocol* (Appendix C) to assess observable aspects of the Comprehensive Biliteracy Instructional Model. Research pairs, wrote positive observations of the Comprehensive Biliteracy Instructional Model and suggestions for

improving implementation to each of the teachers observed. These remarks were also shared with the school's site coordinators and principals.

Analysis of Teachers' Adherence to Measures of Implementation

Analysis of each participating teacher's adherence to the measures of implementation is organized by school and is detailed below. (Codes were created to protect teachers' identities.)

Table 7. Teachers Adherence to Measures of Implementation, CMS Elementary, 2011-12

Grade	Teacher Code	Schedule	PD Sessions (3)	Lesson Plans (2)	Spanish Dictados	English Dictados	Observation
K	K-A	1	3	1	11	n/a	1
1	1-A	1	2	2	15	18	1
2	2-A	1	3	2	12	9	1
3	3-A	1	1	1	8	6	1
4	4-A	1	2	1	11	12	1
5	5-B	1	2	2	12	16	1

CMS Elementary. As illustrated in Table 7, there was variability in adherence to Literacy Squared requirements by teachers at CMS Elementary. None of the teachers met all of the minimum requirements. The first grade teacher was close to meeting all requirements, except that she had missed one of the professional development sessions. Of the six teachers, only two attended all of the professional development sessions. Attendance at the professional development sessions is an essential part to understanding the Literacy Squared model, and absence from these sessions can have negative consequences on the overall implementation of the biliteracy model. Three teachers submitted both lesson plans, and only the first grade teacher administered the minimum number of Dictados in both languages. The fifth grade teacher gave more than the minimum number of Dictados in English, and almost met the minimum number of Spanish Dictados. This was an improvement from previous years of the study. It is important to note that the third grade teacher was out for almost half of the school year. A monolingual

English substitute was in the classroom from March to the end of the year, thus the Literacy Squared model was not implemented with fidelity.

Columbine Elementary. Unlike previous years, data collection to monitor teacher implementation at Columbine Elementary was consistent with that of CMS Elementary. The main difference between schools, though, was that at most grade levels, Columbine had different teachers for Spanish literacy and literacy-based ESL. Thus, the data are presented for each teacher and their corresponding language of instruction and grade level (Cooperating/Partner teachers in Table 8 are coded by grade, with the same letter, and the Spanish literacy teacher is 1 and the literacy-based ESL teacher is 2).

As seen in Table 8, only two of the 21 teachers at Columbine Elementary fulfilled all responsibilities of the Literacy Squared project. The majority of teachers submitted schedules for the Comprehensive Biliteracy Instructional Model. A third of the teachers attended all professional development session, and four teachers only attended one session. All but five teachers submitted two week's worth of lesson plans using the Literacy Squared Lesson Plan Framework. The high level of lesson plan submission could be attributed to the school's concerted effort to provide grade level teams time to plan across literacy environments. This kind of collaboration is worth noting for future recommendations in implementing Literacy Squared with fidelity. When two teachers teach paired literacy instruction to the same children, collaborating during planning periods provides opportunities for teachers to share their pedagogical content knowledge as well as information about students to ensure instruction is at the students' biliterate potential. In regards to the Dictado, three teachers at Columbine fulfilled giving the minimum number of Dictados, and five teachers gave 14 Dictados in Spanish or English. The level of implementation of The Dictado was an improvement from Years 1 and 2. It

is interesting to note that in the majority of classrooms where the literacy block was split, the literacy-based ESL teachers gave more Dictados than did the Spanish literacy teachers. As can be noted from Table 8, adherence to the minimum requirements for the split fifth grade was low. There was a switch in teachers for Spanish literacy that occurred after the first four months of school, thus students in that classroom did not have consistent implementation of the Comprehensive Biliteracy Instructional Model.

Table 8. Teachers Adherence to Measures of Implementation, Columbine, 2011-12

Grade	Teacher Code	Schedule	PD Sessions (3)	Lesson Plans (2)	Spanish Dictados	English Dictados	Observation
K	K-B1	1	1	2	9		1
	K-B2	1	2	2		n/a	1
	K-C1	1	1	2	9		1
	K-C2	1	3	2		n/a	1
1	1-B1	0	2	2	14		1
	1-B2	1	3	2		18	1
	1-C1	0	3	2	24		1
	1-C2	0	1	2		18	1
	1-D	0	1	2	11	10	1
2	2-B1	1	3	2	11		1
	2-B2	0	3	2		12	1
	2-C	1	3	2	13	10	1
3	3-B	1	2	1	7	14	1
	3-C1	1	2	2	12		1
	3-C2	1	2	2		14	1
4	4-B	0	2	1	9	10	1
	4-C1	1	2.5	2	14		1
	4-C2	1	2.5	2		14	1
5	5-A	1	3	2	7	7	1
	5-C1	0	2	1	2		1
	5-C2	0	2	1		5	1

Section 4: Report of Students' Biliteracy Outcomes

Literacy Squared is a biliteracy model designed to respond to the need to cultivate new theories about the development of literacy in two languages as a process rather than as an outcome. In order to understand emerging bilingual learners biliteracy development as a process, the research project measures students' reading and writing progress in both Spanish and English. Through the use of biliterate assessments we acknowledge that emerging bilingual learners distribute their knowledge across contexts and languages. Furthermore, the Literacy Squared research project has been able to establish and understand emerging bilingual students' trajectories toward biliteracy by using bilingual assessments.

Phase II of the Literacy Squared Project followed students through the initial stages of literacy development in Spanish and English. Four separate grade level cohorts of students across three grades were followed in the second phase of the study. Cohort I includes students from kindergarten through second grade, Cohort II from first through third grade, Cohort III from second through fourth grade, and Cohort IV from third through fifth grade. As the final year of Phase II, students' longitudinal biliteracy outcomes in reading and writing are presented from Years 1-3.

Research Questions

1. What gains in Spanish and English reading achievement were made by Cohorts I-IV from Years 1 to 3 of Phase II as measured by the EDL2 and DRA2?
2. How did the biliterate writing skills of students in Cohorts I-IV develop from Year 1 to Year 3 of Phase II as measured by the Literacy Squared® Writing Rubric?
3. What were third, fourth, and fifth grade student outcomes on the 2012 TCAP?

4. What percentage of students at each grade level ended the year with reading achievement levels that reflect benchmark biliteracy zones?

Data Sources and Methods of Data Collection

Receptive and productive language skills were measured with both informal and formal instruments to answer the research questions. All assessments were used to document trends and patterns of development between and across languages that are distinctive to emerging bilingual learners and to inform instruction.

Measures 1 and 2: The *Evaluación del Desarollo de Lectura* and Developmental Reading Assessment. Each spring, teachers evaluate students' reading progress using the Spanish language *Evaluación del Desarrollo de Lecto-escritura* (EDL2) (Celebration Press, 2007a) and the English language *Developmental Reading Assessment* (DRA2) (Celebration Press, 2007b). These measures were identified because they were available in both Spanish and English. Together they provided information to examine students' reading trajectories toward biliteracy. Moreover, in addition to being useful for researchers, these tools were informative in helping teachers design and deliver instruction for children. Scores on the EDL2 range from A through level 60 and scores on the DRA2 range from A through 80. However, increments between scores are uneven. The EDL2 and DRA2 have been studied and determined to be valid and reliable measures of reading in Spanish and English (Pearson Education, 2009).

Measure 3: The Literacy Squared® Writing Rubric. For the purposes of the Literacy Squared research study, writing development is monitored and analyzed through the collection of writing samples in Spanish and English one time each year (with the exception of kindergarten in which only a Spanish writing sample is collected). Midway through the year, all students are given 30 minutes to respond to a Spanish writing prompt, and two weeks later, they are given 30

minutes to respond to a similar, but not identical English writing prompt. These samples are carefully evaluated using the *Literacy Squared Writing Rubric*, a researcher-designed rubric purposefully developed to compare and contrast students' writing trajectories in Spanish and English throughout the elementary grades. The rubric quantitatively evaluates content (10 points), knowledge of structural elements (5 points), and spelling (6 points). For more information on the writing rubric and inter-rater reliability, see Butvilofsky & Sparrow (2012).

Measure 4: The Transitional Colorado Assessment Program. Formal reading and writing assessments in this study included the Transitional Colorado Assessment Program (TCAP). The TCAP is a criterion-referenced exam that all students in Grades 3 through 5 are required to take in both reading and writing. These assessments are the high stakes measures used to assess student achievement and school performance. Utilizing these measures in the model was important given that most major policy decisions with regard to literacy programs and instruction, as well as school and teacher effectiveness are currently being made based on outcomes of these measures. The TCAP is offered in Spanish at the third and fourth grades, but the case study schools in our research project give students in the Literacy Squared project the Spanish versions of the reading and writing (*Lectura* and *Escritura)* assessments only at the third grade.

Methods of Analysis

To document research results and address the four research questions from Year 3 of Phase II of the study, we used various statistical tools. For Research Questions 1 and 2, descriptive statistics were used to examine students' longitudinal growth in reading and writing. In addition, paired t-test analyses were used to compare growth in students' mean Spanish and English reading from Spring 2010 to Spring 2011, and from Spring 2011 to Spring 2012. It is

important to note that EDL2 and DRA2 scores were recalibrated for this analysis because increments between scores are uneven, making the calculation of growth across years difficult to interpret. While the primary grades have several levels within each grade, the intermediate grades do not. Thus, for the purpose of answering Research Question 1, scores were recalculated to better illustrate student growth from Years 1 through 3. A list of these adjusted scores can be found in Table 9.

Table 9. Recalculated EDL2/DRA2 Levels

Grade Level Benchmark	Original Level	Revised Level
	A	0
	1	.25
	2	.50
End of Kindergarten (BVSD)	3	.75
(DPS)	4	1.0
	6	1.17
	8	1.33
	10	1.5
	12	1.67
	14	1.83
End of 1st Grade	16	2.0
	18	2.25
	20	2.5
	24	2.75
End of 2nd Grade	28	3.0
	30	3.33
	34	3.67
End of 3rd Grade	38	4.0
End of 4th Grade	40	5.0
End of 5th Grade	50	6.0
End of 6th Grade	60	7.0

To answer Research Questions 3 and 4, frequency distributions were used to determine the percentage of students' levels of proficiency on the TCAP (Research Question 3) and the percentage of students within their Grade Level Benchmark Biliterate Reading Zones (Research Question 4).

When interpreting results, it should be noted that levels of implementation at CMS Elementary were very low in the second and third grades in 2010-11 and implementation at the third grade in 2011-12. The low level of implementation at these grades, affected the quality of instruction students in Cohort II received, which ultimately affected their biliteracy outcomes.

Findings

Research Question 1. The first research question examined student growth in Spanish reading (EDL2) and English reading (DRA2) over the three years of the project (in which mean reading scores were taken in the Spring of 2010, 2011, and 2012). Table 10 summarizes the spring mean Spanish and English reading scores by cohort group for all students in the Literacy Squared Colorado Case Study. Additionally, growth in Spanish and English reading as measured using the recalculated EDL2 and DRA2 scores are represented. Figures 1-2 illustrate gains for each cohort by language. Tables 11 and 12 disaggregate the data by school.

Table 10. Longitudinal Mean Spanish and English Reading Scores and Overall Gains, Literacy Squared Aggregate, 2010-2012

Cohort Grades	*n*	Measure	Mean 2010	SD	Mean 2011	SD	Mean 2012	SD	Gain Years 1-2	Gain Years 2-3	Total 2 Year Gain
I K/1/2	*35*	EDL2	2.9	*2.4*	16.1	*3.5*	27	*4.1*	1.4	0.9	2.3
		DRA2	1.5	*0.7*	8.2	*4.3*	19.1	*6.4*	1	1	2
II 1/2/3	*37*	EDL2	14.5	*5.4*	22.4	*6.7*	30.5	*10*	0.7	0.9	1.6
		DRA2	4.7	*3.4*	13.2	*5.7*	23.8	*8*	0.9	1	1.9
III 2/3/4	*55*	EDL2	24.4	*6.9*	32.8	*6.6*	40.8	*9*	0.8	1.2	2
		DRA2	15.4	*7.6*	26.1	*9.1*	36.2	*8.9*	1	1.3	2.3
IV 3/4/5	*45*	EDL2	32.8	*9.1*	39.1	*9.9*	50	*11.3*	1.1	1.2	2.3
		DRA2	20.6	*9.5*	32.2	*11.2*	44.5	*12.5*	1.3	1.5	2.8

As can be seen in Table 10, all cohorts, except Cohort II, exhibited at least two years of growth in Spanish and English for the two-year period. Annual growth in Spanish reading was greatest from kindergarten to first grade between Year 1 and 2 totaling 1.4 years, and the greatest yearly gains in English reading occurred from fourth to fifth grade from Years 2 to 3, totaling 1.5

years. Of particular interest, is noting the biliterate development made by Cohort I, as by the end of the three years of paired literacy instruction, their average second grade Spanish and English reading scores (27 and 19.1 respectively) are higher than for students in Cohorts II (22.4 and 13.2) and III (24.4 and 15.4) when in second grade. This is a noteworthy finding, as in Phase I we did not include kindergarten. The differences between cohort groups indicate, especially in English reading, that as students receive instruction in both Spanish literacy and literacy-based ESL starting in kindergarten, their reading skills in both languages are accelerated and it is more likely they will be in the Benchmark Biliterate Reading Zones (see results to Research Question 4 for more on this). Accelerated gains in both Spanish and English reading also occurred from the third to fourth grade as noted for Cohorts III and IV, as well as from fourth to fifth grade for Cohort IV.

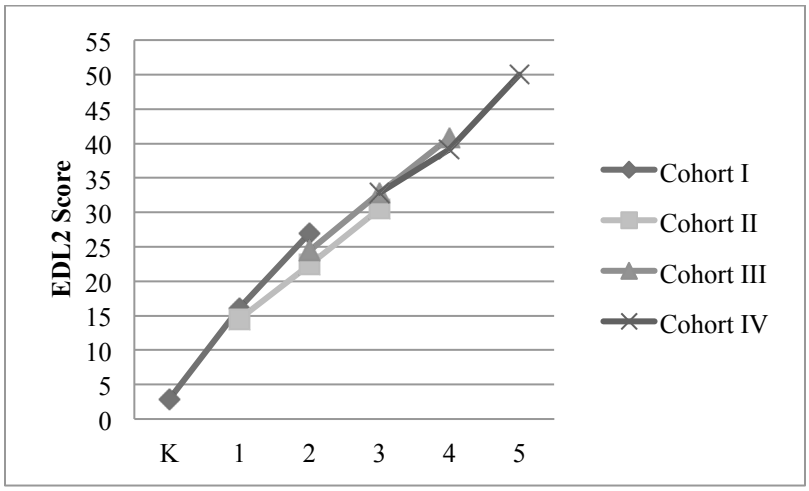

Figure 1. Longitudinal Spanish reading scores, Literacy Squared aggregate, 2010-2012

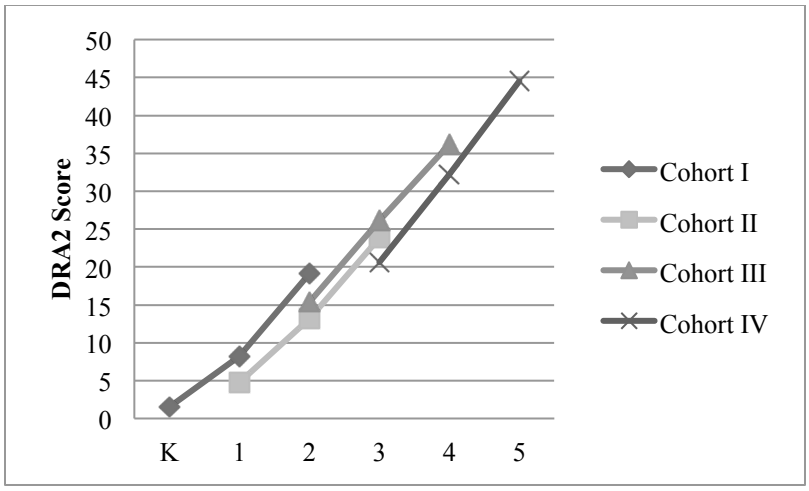

Figure 2. Longitudinal English reading scores, Literacy Squared aggregate, 2010-2012

Figure 3 illustrates Spanish and English reading progress for each of the cohorts. As students received continuous paired literacy instruction, the differences between Spanish and English reading achievement decreases. This is especially evident for Cohorts III and IV.

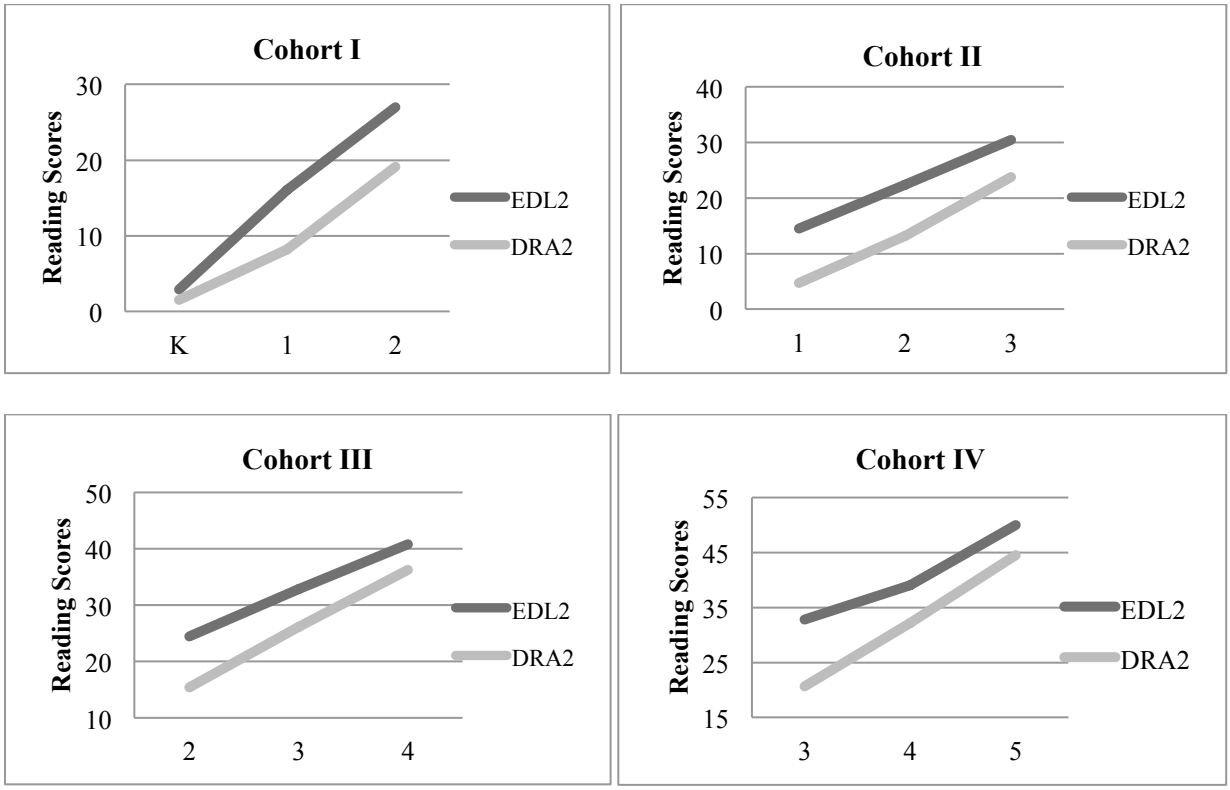

Figure 3. Longitudinal Spanish and English reading scores by cohort, 2010-2012

In addition to the descriptive statistics, t-test analyses were done to ascertain whether differences between years were statistically significant. Our analysis revealed a significant difference in Spanish and English reading growth between Years 1-2 and for Years 2-3 for the Literacy Squared aggregate (p. <.001). This finding indicates the potential of the Literacy Squared intervention to improve Spanish and English reading across time. In addition, findings indicate the constant acceleration of Spanish and English reading growth across grades between the Spring of Year 1 and 3 of Phase II.

CMS Elementary. All cohorts at CMS made positive gains in both Spanish and English reading in Phase II of the study, although differences in gains existed for each of the cohorts as illustrated in Table 11. While there was some consistency in the amount of gains for Spanish and English for the Literacy Squared aggregate across cohorts and languages (Table 10), trends were distinct for CMS. Cohort II only made the equivalent of one year's growth in Spanish from the end of first grade to the end of third grade, and only 1.2 year's growth in English reading. The mean Spanish and English reading scores of this cohort at the end of third grade were comparable to the students in Cohort I at the end of second grade in 2012. These low scores are a reflection of low levels of implementation of the Literacy Squared model in second grade in 2010-11 and in third grade in 2011-12. Cohort III barely made a year's growth between second and third grade, however they made accelerated gains in Spanish and English from third to fourth grade, 1.4 and 1.5 years respectively. While we are quite impressed with the gains Cohort IV made in English reading over the two years, we know that there was a focus on English literacy instruction, which took away from paired literacy instruction, or time away from Spanish literacy.

Table 11. Longitudinal Mean Spanish and English Reading Scores and Overall Gains, CMS, 2010-2012

Cohort Grades	*n*	Measure	Mean Spring 2010	SD	Mean Spring 2011	SD	Mean Spring 2012	SD	Gain Years 1-2	Gain Years 2-3	Total 2 Year Gain
I K/1/2	*13*	EDL2	4.5	3.2	16.3	3.9	25.9	4.4	1.1	0.8	1.9
		DRA2	1.8	0.7	7.1	5	14.6	2.4	0.8	0.7	1.5
II 1/2/3	*19*	EDL2	15.3	5.6	19.1	6.1	25.9	9.5	0.4	0.6	1
		DRA2	5.7	4.2	9.8	4.3	18.4	4.9	0.4	0.8	1.2
III 2/3/4	*18*	EDL2	23.3	7.3	31.1	6.7	41.1	12.7	0.8	1.4	2.2
		DRA2	10.1	5.9	20	7.9	32.2	9.4	0.8	1.5	2.3
IV 3/4/5	*21*	EDL2	35.6	7.6	39.5	9.1	49.1	9.6	0.9	1	1.9
		DRA2	19	7.1	31.7	12.6	46.4	12.2	1.4	1.7	3.1

Columbine Elementary. Similar to the Literacy Squared aggregate, overall gains in Spanish and English reading increased across grade levels at Columbine, as presented in Table 12. Cohort I demonstrated the greatest gains in Spanish reading levels from kindergarten to first grade, with 1.5 years growth. Students in Cohort IV made 1.4 years growth in both Spanish and English reading from the fourth to fifth grades. What is most impressive about the findings related to reading outcomes for Columbine is that one can see the benefit of teacher and student participation in Literacy Squared over time. When comparing cohort scores from the same grade level, it becomes apparent that scores are higher in both Spanish and English for cohorts that experienced paired literacy instruction for a longer period of time. For example, when comparing second grade scores for Cohorts I, II, and III: Cohort I had the highest mean scores in both Spanish and English. Unlike results from CMS, this is consistent for all cohorts at Columbine, which provides further evidence that maintaining high levels of fidelity to the biliteracy model over time, leads to accelerated gains in Spanish and English reading outcomes.

Table 12. Longitudinal Mean Spanish and English Reading Scores and Overall Gains, Columbine, 2010-2012

Cohort Grades	*n*	Measure	Mean Spring 2010	SD	Mean Spring 2011	SD	Mean Spring 2012	SD	Gain Years 1-2	Gain Years 2-3	Total 2 Year Gain
I K/1/2	*22*	EDL2	2	0.8	16	3.3	27.7	3.8	1.5	1	2.5
		DRA2	1.3	0.6	8.9	3.8	21.7	6.6	1.1	1.1	2.2
II 1/2/3	*18*	EDL2	13.7	5.1	26	5.6	35.3	7.4	1.1	1.1	2.2
		DRA2	3.6	2	16.8	4.9	29.6	6.5	1.3	1.1	2.4
III 2/3/4	*37*	EDL2	24.9	6.7	33.6	6.5	40.7	6.7	0.9	1.1	2
		DRA2	18	7.1	29.3	8	38.2	8.1	1	1.2	2.2
IV 3/4/5	*24*	EDL2	30.3	9.9	38.8	10.7	50.6	12.8	1.2	1.4	2.6
		DRA2	22.1	11.1	32.7	10.1	42.8	12.9	1.2	1.4	2.6

Research Question 2. Research Question 2 examined the cohort group's biliterate writing development from Year 1 to Year 3 of Phase II as measured by the Literacy Squared Writing Rubric. The Literacy Squared Writing Rubric evaluates students' writing skills on three linguistic constructs in Spanish and English: content (0-10 points), structural elements (0-5 points), and spelling (0-6 points). For the purposes of answering Research Question 2, the overall total for all linguistic constructs was used in determining mean scores. Overall mean Spanish and English writing scores are reported in Table 13 by cohort group for all students in the Literacy Squared research study. Tables 14-15 disaggregate results by school.

Table 13. Longitudinal Overall Mean and English Writing Scores, Aggregate, 2010-2012

Cohort Grades	*n*	Language	Mean 2010	SD	Mean 2011	SD	Mean 2012	SD
I K/1/2	*45*	Spanish	3.8	2.5	10	2.5	12.1	1.7
		English	n/a	n/a	7.1	3	10.5	2.6
II 1/2/3	*39*	Spanish	9.3	2.3	11.3	2.3	12.4	2.3
		English	6.6	2.8	9.8	2.7	11.8	2.1
III 2/3/4	*53*	Spanish	10.9	1.6	12.3	2.2	12.8	1.9
		English	9.4	2	10.7	2.9	12.7	2.2
IV 3/4/5	*45*	Spanish	11.4	1.7	13.5	2.2	13.8	2.1
		English	10	1.8	11.9	2.4	13.4	2.3

Findings demonstrate growth for all cohorts in Spanish and English writing. Spanish mean scores are always higher than English, and similar to findings in reading outcomes, the sooner students received paired literacy instruction, the higher their Spanish and English writing scores. For example, students in Cohort I at the first and second grades, have higher overall mean averages in Spanish and English writing than students in the first and second grades in Cohorts II and III. This is especially evident in Figures 4 and 5.

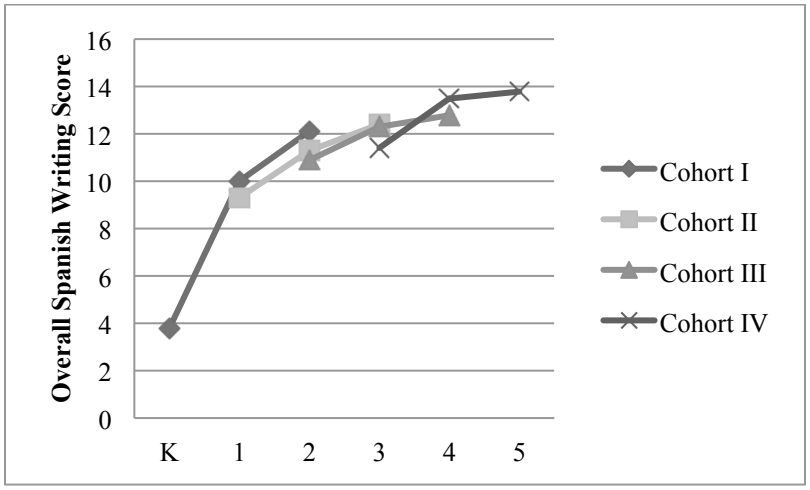

Figure 4. Longitudinal Spanish writing scores, Literacy Squared aggregate, 2010-2102.

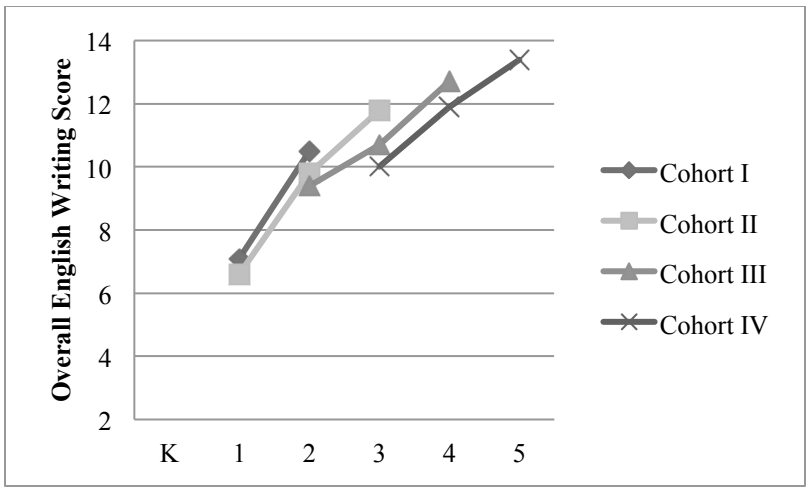

Figure 5. Longitudinal English writing scores, Literacy Squared aggregate, 2010-2012.

Figure 6 illustrates Spanish and English writing progress for each of the cohorts. As students receive continuous paired literacy instruction, the differences between Spanish and English writing achievement decreases.

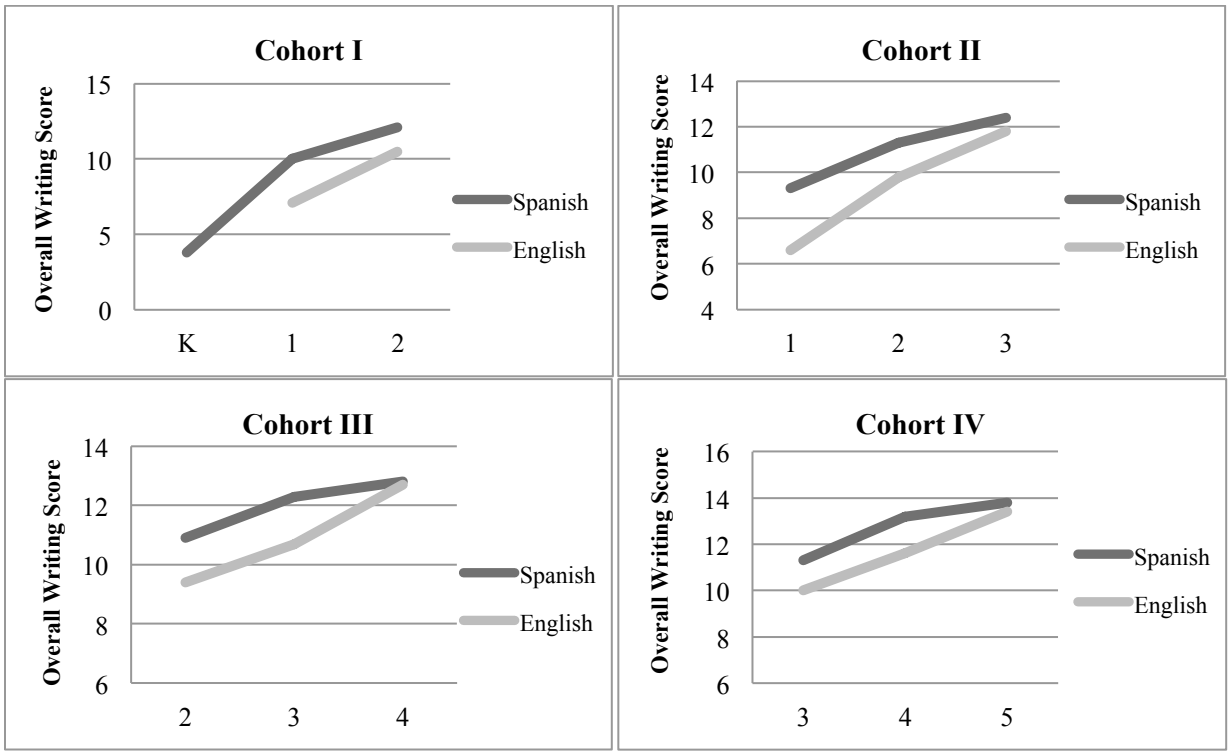

Figure 6. Longitudinal Spanish and English writing scores by cohort, 2010-2012

CMS Elementary. CMS students' writing scores increased for Cohorts I-IV in both Spanish and English, and the gains were somewhat similar to the aggregate. However, students in Cohort IV only gained 0.3 points overall in Spanish writing from fourth to fifth grade, although they did increase almost two points in English writing. This minimal gain in Spanish writing again demonstrates the difficulty CMS Elementary had in implementing Spanish literacy with a high level of fidelity.

Table 14. Longitudinal Overall Mean and English Writing Scores, CMS, 2010-2012

Cohort Grades	*n*	Language	Mean 2010	SD	Mean 2011	SD	Mean 2012	SD
I	*21*	Spanish	4.5	2.8	9.4	2.3	11.4	1.2
K/1/2		English	n/a	n/a	7.4	2.7	9.8	2.4
II	*16*	Spanish	9.1	1.8	10.8	1.4	13.2	1.9
1/2/3		English	6.1	2.7	9.2	2	11.2	2.2
III	*19*	Spanish	11.2	1.9	12.6	2.5	13	1.7
2/3/4		English	9.4	2.3	10.8	3.6	12.8	2.6
IV	*21*	Spanish	11.9	1.7	13.6	2.3	13.9	2.3
3/4/5		English	10.1	1.8	12.5	2.5	14.3	2.5

Columbine Elementary. Students' mean writing scores in both Spanish and English increased from Year 1 to Year 3 at Columbine (see Table 15). The greatest gains occurred for Cohorts I and IV. At fifth grade, Cohort IV had the highest mean scores in both Spanish and English writing that we have seen in any of our analyses, even though there was only a .3 point gain in Spanish writing from fourth to fifth grade. Overall, the positive gains made by all cohorts demonstrate that the longer students receive paired literacy instruction with a focus on writing instruction, the greater the student outcomes.

Table 15. Longitudinal Overall Mean and English Writing Scores, Columbine, 2010-2012

Cohort Grades	*n*	Language	Mean 2010	SD	Mean 2011	SD	Mean 2012	SD
I	*24*	Spanish	3.2	2	10.5	2.6	12.7	2
K/1/2		English	n/a	n/a	6.9	3.3	11.2	2.7
II	*23*	Spanish	9.5	2.7	11.6	2.8	11.9	2.4
1/2/3		English	6.9	2.9	10.2	3.1	12.3	2.1
III	*34*	Spanish	10.8	1.4	12.1	1.9	12.8	2
2/3/4		English	9.4	1.8	10.7	2.4	12.6	2.1
IV	*24*	Spanish	11	1.6	13.3	2.2	13.8	1.9
3/4/5		English	9.9	1.8	11.4	2.2	12.7	1.9

Research Question 3. The third research question sought to examine third, fourth, and fifth grade student achievement on the TCAP. The TCAP is the large scale "high stakes" academic test administered throughout the state of Colorado to students in grades three through

ten. Schools are evaluated based on student outcomes measured by these instruments. The reading and writing portions of these tests are available in Spanish for grades three and four, but are only rarely utilized beyond grade three. All versions and levels of the TCAP use a four-tier system for categorizing student scale scores. These pre-determined ranges are labeled as: unsatisfactory (U), partially proficient (PP), proficient (P), and advanced (A).

Table 16. Percent of Students at Proficiency Ranges for the TCAP, Literacy Squared Aggregate, 2012

TCAP	Grade	*n*	U %	PP %	P %	A %	P + A %
Lectura	3	*50*	14	28	48	10	58
Escritura		*50*	14	20	50	16	66
Reading	4	*64*	33	44	22	0	22
Writing		*64*	13	64	22	0	22
Reading	5	*53*	30	51	17	0	17
Writing		*53*	15	62	21	0	21

Table 16 reports the percentage of students at each proficiency level by grade and subject area. Fifty-eight percent of the third grade students participating in Literacy Squared in Colorado scored proficient or advanced in Spanish reading (*Lectura*), and in Spanish writing (*Escritura*), 66% were proficient or advanced. Outcomes for the third grade *Lectura* and *Escritura* outcomes in 2012 were lower than in previous years of the case study. This trend was noted statewide in both the Spanish and English versions of the assessment, as the TCAP changed to support the new standards the State of Colorado is adapting. The percentage of students scoring proficient or advanced in the fourth grade decreased in Reading from 24% to 22%. However, a slight increase existed in fourth grade Writing scores, from 21% to 22%. There also was a decrease, in TCAP Reading results for all three years of the project in the fifth grade, from 26% in 2010, to 25% in 2011, and to 17% in 2012. For fifth grade writing results, a small decrease existed from Year 2 to

Year 3, 24% to 22%, but an overall increase from Year 1 in which only 10% of students scored proficient or advanced. Tables 17 and 18 summarize proficiency levels by school.

Table 17. Percent of Students at Proficiency Ranges for the TCAP, CMS, 2012

TCAP	Grade	n	U %	PP %	P %	A %	P + A %
Lectura	3	23	9	30	43	17	61
Escritura			9	26	43	22	65
Reading	4	24	58	13	29	0	29
Writing			21	71	8	0	8
Reading	5	23	17	61	22	0	22
Writing			9	65	26	0	26

CMS Elementary. Despite state and district trends, CMS demonstrated gains in TCAP scores in almost every subject area and grade level (see Table 17). Sixty-one percent of third grade students scored proficient or advanced on the CSAP *Lectura*, a five percent increase from the previous year. Sixty-five percent of third grade students scored proficient or advanced on *Escritura*. At fourth grade, 29% of students scored proficient on the TCAP reading exam, an increase of 21% from Year 2; however, the percent of students scoring proficient on TCAP writing remained at 8%, the same result as Year 2. Many more students were proficient in the fifth grade on both the TCAP Reading and Writing exams, the increase in reading was two percent, and in writing, there was a nine percent increase from Year 2. In comparison with Year 2, there were fewer fifth grade students scoring unsatisfactory in both reading and writing, with an overall increase of students in the partially proficient category. The increase in the number of students scoring proficient or advanced could possibly be attributed to the intense focus on test taking skills that occurred from January through March in the intermediate grades. However, it is also important to note that while there was an increased focus on the TCAP test-taking skills, other aspects of instruction were interrupted, such as the implementation of Spanish literacy,

Science, and Social Studies. Although scores did improve, less than 30% of the students were proficient or advanced.

Columbine Elementary. Fifty-six percent of the third grade students at Columbine scored proficient or advanced on the CSAP *Lectura*, and 67% were proficient or advanced on CSAP *Escritura* (see Table 18). As noted at the state level, there was a drop in the number of students scoring proficient or advanced at all grade levels on the TCAP Reading and Writing exams. It is interesting to note that at each grade level, there were many more students scoring proficient or advanced in Writing than in Reading. This could be due to the emphasis the Comprehensive Biliteracy Instructional Model puts on writing instruction within Literacy Squared.

Table 18. Percent of Students at Proficiency Ranges for the TCAP, Columbine, 2012

TCAP	Grade	*n*	U %	PP %	P %	A %	P + A %
Lectura	3	*27*	19	26	52	4	56
Escritura			19	15	56	11	67
Reading	4	*40*	18	63	18	0	18
Writing			8	60	30	0	30
Reading	5	*30*	43	43	13	0	13
Writing			23	60	17	0	17

Research Question 4. Research Question 4 examined the percentage of students at each grade level that ended the year with reading achievement levels within their Grade Level Benchmark Biliterate Reading Zones (see Table 19). The EDL2 and DRA2 are informal reading assessments designed for and normed on monolingual speakers of Spanish and English, respectively. However, in considering emerging bilingual learners receiving paired literacy instruction, the Literacy Squared research team proposed that as students developed Spanish and English literacy simultaneously, they would not do so at equivalent rates. Thus, we created the Biliterate Reading Zones to illustrate the way in which emerging bilingual learners would progress in biliteracy, with their Spanish reading slightly more advanced than their English

reading. In order to ensure that emerging bilingual students are viewed holistically and to take into account what they can do in both languages, in addition to examining students' reading levels in each language (Research Question 1), Literacy Squared also considers the percent of students who are within the Biliterate Reading Zones (see Table 19).

Table 19. Grade Level Benchmark Biliterate Reading Zones

Grade	EDL2 Level (Spanish)	DRA2 Level (English)
K	A-6	A-2
1	12-16	8-10
2	18-28	12-16
3	30-38	18-28
4	40	30-38
5	50-60	40+

Table 20 identifies the percent of Literacy Squared students within the biliteracy zones for their grade level for the past three years of Phase II. Kindergartners are not included in this analysis, as the way the Biliterate Reading Zones were created allows for almost all kindergartners to fall within a zone, since many of them score between levels 2-6 on the EDL2. For every grade level, except for third grade, a larger percent of students met their grade level biliterate benchmark zones in the third year of the project. The drop in third grade can be attributed to the low level of implementation at CMS (see Table 21). The largest percent of students in the biliterate reading zone, 78%, was for students in the second grade in 2011-12. The majority of students at this grade level had received paired literacy instruction since kindergarten and was accelerating in their biliterate reading development. Students in the fifth grade, in 2011-12 also benefitted from the Literacy Squared model, as 69% were reading at a levels 50-60 in Spanish and at least at a level 40 in English. These findings support the overall supposition of Literacy Squared that starting paired literacy instruction sooner and sustaining it through the fifth grade helps foster biliterate reading development.

Table 20. Percentage of Students At or Above in Grade Level Benchmark Biliterate Reading Zones, Literacy Squared Aggregate, 2009-2012

Grade	2009-10	2010-11	2011-12
1	15	31	55
2	61	59	78
3	56	59	48
4	44	52	53
5	57	59	69

CMS Elementary. Similar to the aggregate, a larger percent of students at CMS met their grade level benchmark zones in the second and third years of the study, with the exception of first graders in 2010-11 and third graders in 2011-12 (see Table 21).

Table 21. Percentage of Students At or Above Grade Level Benchmark Biliterate Reading Zones, CMS, 2009-2012

Grade	2009-10	2010-11	2011-12
1	23	7	44
2	29	40	73
3	48	52	25
4	54	50	46
5	n/a	57	70

Table 22. Percentage of Students At or Above Grade Level Benchmark Biliterate Reading Zones, Columbine, 2009-2012

Grade	2009-10	2010-11	2011-12
1	4	55	59
2	82	77	81
3	63	63	71
4	33	54	58
5	57	63	69

Columbine Elementary. For Columbine students at each grade level, the percent of students within their grade level benchmark zone increased each year over the course of Phase II, with the largest percent of students within the Grade Level Benchmark Biliterate Reading Zones in 2011-12. This is an important finding for our research, in that it confirms previous findings that teachers may be better able to implement the Literacy Squared model after having done so

for a few years and that paired literacy instruction accelerates students' Spanish and English literacy development.

Discussion and Recommendations

Overall, Literacy Squared Phase II: Colorado Case Study has been a tremendous learning experience. The primary purpose for the case study in Colorado was to understand the association between fidelity of implementation of the Literacy Squared model and the biliteracy achievement of emerging bilingual children. Through our collaboration with the various teachers, leaders, and children at the schools, we learned ways in which to change and improve the biliteracy model in order to increase emerging bilingual students biliteracy achievement, and we learned of some of the challenges that face our schools that prevent them from implementing the model with fidelity.

This section of the report utilizes the purposes of the Colorado Case Study to organize the discussion and recommendations related to our overall findings.

Association between Fidelity of Implementation and Students' Biliteracy Achievement

The researchers' time spent at the different school sites and the data collected provided insight into teachers' levels of implementation. Our data reveal a relationship between fidelity of implementation and students' biliteracy outcomes, thereby indicating the potential of the biliteracy model. Over the three years of the study, we noticed a higher level of adherence to the implementation of the Literacy Squared model through teachers' increased fulfillment of the requirements set out by the project. This included the submission of schedules, lesson plans, and implementation of The Dictado.

When examining the biliteracy outcomes of students that were in classrooms with high implementers, we noticed accelerated gains in both Spanish and English literacy development. In

general, with moderate levels of implementation, we learned that students make at least one year's growth in Spanish and English reading. With high implementers, however, we have observed gains of 1.4 years in each language. This is demonstrative of the potential in developing students' trajectories toward biliteracy.

However, implementation of the Literacy Squared model was uneven and was bimodal with high and low implementers at all sites. Inconsistencies in implementation in Spanish literacy were noticed at the intermediate grades in Denver, and inconsistencies in the implementation of literacy-based ESL were observed in both Boulder and Denver at the primary grades. As a result, the level of fidelity to the model directly affects students' biliteracy achievement. Some common characteristics related to levels of implementation are as follows:

High levels of implementation can be attributed to:

- Consistency in programming. In other words, schools make Literacy Squared the priority. This requires a keen sense of scrutiny in deciding which other literacy programs or curriculum should be used. A sense of focus is needed in programming to ensure teachers' attention goes towards implementing the biliteracy model with fidelity.
- Keeping qualified teachers in the biliteracy model. Preparing teachers to learn the biliteracy model is an investment that takes time and it is critical that school site coordinators and leadership follow through on continuing to support teachers as they learn about the biliteracy model.
- Teachers' attendance and participation in professional development is vital to maintain consistency in the model's implementation.
- Schools, administrators, and teachers keep their commitment to implementing aspects of the biliteracy model after professional development sessions as well as on-site support.

Obviously, conditions of low levels of implementation are the opposite of high implementation, but need to be discussed as well:

- Mandated curriculum and punitive measures mandated at the district level prevent schools from implementing the Literacy Squared model. It is difficult for schools to maintain a sense of fidelity to a biliteracy model, when the school is rated based on monolingual high-stakes assessments.
- Lack of focus. Schools have too many programs that need to be learned and implemented. The more programs that need to be implemented, the less time that can be dedicated to implementing Literacy Squared and the Comprehensive Biliteracy Instructional Model. Many of the programs (both mandated and self-selected) do not conform to the major tenets of Literacy Squared. The model recommends more explicit, direct, and interactive methods for teaching biliteracy, while the methods recommended by other programs promote some modeling by the teacher with the majority of time dedicated to students working independently.
- High teacher turnover. Although sometimes an uncontrollable factor and a prevalent issue in schools that are highly segregated and poor, effort must be made to maintain teachers and develop their capacity to learn and deliver high quality biliteracy instruction.
- It is not in the best interest for schools, teachers, or children to be constantly changing or rearranging programs. It is unlikely that staff can learn new programs well and evaluate their value when the status quo is always changing.

Overall, findings from this study indicate that levels of implementation are related to students' biliteracy achievement.

Relationship between Students' Biliteracy Outcomes and High Implementation Across Grades

As mentioned above, implementation of the Literacy Squared model was inconsistent between schools and across grades within schools. By examining teachers' levels of adherence to the biliteracy model and participating emerging bilingual students' Spanish and English reading and writing outcomes as measured by both formal and informal measures we were able to understand the potential of the Literacy Squared model.

Students' biliterate development progressed across grades, as was illustrated in the longitudinal analyses for reading and writing outcomes. However, over the course of the three-year study, we did not observe high levels of implementation for two consecutive years for a cohort of students within a school and we feel confident that we can attribute this to levels of fidelity.

Despite the fact that we did not have high implementation across grades in this case study, the implementation of Literacy Squared starting in kindergarten resulted in a significant finding. Starting paired literacy instruction in kindergarten seems to have a direct relationship with having an increased number of students in the grade level benchmark biliteracy zone in second grade. That is, after three years of paired literacy instruction starting in kindergarten, we observed the greatest percentage of students to be within the grade level benchmark biliteracy zone in the eight years we have been conducting this research (see Table 20).

Linking Professional Development with Levels of Implementation

In order to enhance and develop capacity for teachers to fully implement Literacy Squared and to support leadership in the implementation of the biliteracy model, sustained and multi-leveled professional development opportunities were provided for all case study schools. A unique aspect of the Colorado Case Study involved the varied level of support each school

received based on their strengths and needs. During the course of the case study, schools received three to four general professional development sessions and additional on-site support. Literacy Squared research liaisons provided on-site support and worked closely with the school site coordinators to ensure teachers had a working knowledge of various components of the Literacy Squared model. On-site support was differentiated at each school and included: planning biliteracy/literacy lessons; modeling and co-teaching lessons; observing teachers and providing feedback; explaining the biliteracy model; and discussing levels of implementation.

The general professional development sessions were useful in proving the entire school with theoretical and practical understandings as well as concrete examples of the Literacy Squared model. In addition, general sessions are conducive to building community and establishing cohesiveness. As can be seen from the section on teachers' adherence to the model, we did not experience great attendance at all of these sessions. We also found that full-day sessions were not as conducive to participant learning as were half-day sessions.

The level of support that was most constructive for participating teachers was the on-site support given via planning of biliteracy/literacy lessons and modeling/co-teaching of lessons. By having the research liaison model the various pedagogical approaches and the components of the Comprehensive Biliteracy Instructional Model, teachers were able to see Literacy Squared in action. These interactions were even more effective when the gradual release of responsibility was used and the classroom teacher was given more responsibility to take over the lesson with support from the liaison. Unfortunately, these learning opportunities for teachers were not as frequent as they could have been as they take a great amount of time to orchestrate and carry out. Furthermore, on more than one occasion, a liaison began the lesson, co-taught the lesson with a teacher, but then the teacher, due to other obligations, abandoned the lesson. Another important

level of support that benefited teachers and students, were the opportunities teachers had to collaborate and plan with one another. At Columbine, where a dual language model was being implemented, collaboration between teachers that provided paired literacy instruction to the same group of students enabled teachers to share their pedagogical knowledge of the biliteracy model as well as relevant information about students' performance in each language. This information was then used to ensure instruction in each language environment was at the students' biliterate potential.

Both successes and challenges in carrying out professional development need to be recognized. From our experience over the years, we know that more work is needed to assure teachers have the opportunity to follow through with and collaborate with other to ensure the adapted biliteracy model with a high level of fidelity.

Students' Longitudinal Biliteracy Achievement

The last purpose of the Colorado Case Study was to continue examining emerging bilingual students' longitudinal achievement in Spanish and English reading for the three years of the study and to examine results vis-à-vis trajectories toward biliteracy. Despite varied levels of implementation, participating students made positive gains in their biliterate reading and writing development over the course of the study. In fact, we saw an overall increase in the percent of students within the Grade Level Biliteracy Reading Zones in Year 3, except for the third grade. Furthermore, as students progress across grades, differences between reading and writing abilities in Spanish and English decrease, and we see this as evidence for the effects of cross-language transfer and the cumulative effects of the Literacy Squared instructional model. However, data need to be interpreted cautiously because of varying levels of implementation.

Conclusion

By way of summary, it is important to reiterate that in its totality, Literacy Squared is innovative in ways that make it quite different from current approaches to either bilingual or dual language education. We are learning that it will take time and focus to ensure fidelity of implementation. In this regard, it may be that the concepts in Literacy Squared are so novel that it takes more intensive on-site assistance in order to maximize implementation of the instructional component. It is also important that we secure additional assurances from schools that there will be a reduction of extraneous programs to ensure that Literacy Squared can be implemented fully across grade levels.

Literacy Squared was designed to be the biliteracy program in participating schools and what we have observed in all of our schools is that it has been added on to existing programs. That said, there is an immediate need for the research team and each of our school sites to arrange times to meet and discuss the contents and implications of this report. The research team welcomes an opportunity to do this and wishes to assure our school sites that our efforts in this project are collaborative. We must work together if we are to succeed.

As noted above, both our theoretical framework and emerging data indicate that the highest outcomes accrue in schools that have the highest levels of implementation and that the overall effects are cumulative. That stated, our challenge becomes how to ensure that we are getting high levels of implementation in each classroom and how to ensure that these levels are sustained across grade levels. Data from observations and interactions with teachers at several sites have created a concern that one potential issue with fidelity of implementation is the shear number of literacy programs teachers are asked to implement, some of which have contradictory pedagogical approaches. We cannot, in good faith, continue to call schools Literacy Squared

schools when teachers are impeded from implementing the program in its entirety and with fidelity. To be specific, major concerns with regards to levels of implementation were the maintenance of Spanish literacy at the intermediate grades (especially the fourth and fifth grades) in the Denver schools, and the overall quality of literacy-based ESL in all grades. Again, we are challenged to work together to generate ways to address these issues.

Although we regret that we were not able to achieve high levels of implementation across all sites and grade levels, we still believe in the potential of the biliteracy model. In the field of bilingual education, our case study schools are on the cutting edge in relation to how they assess Spanish-English emerging bilingual children and in learning how to plan biliterate instruction. Further, we believe in our school leaders and our teachers. Many of the participating teachers have commented on how much they have learned related to these areas and that Literacy Squared professional development sessions and on-site support have been the most useful and beneficial to their practice. We recognize and appreciate how hard all of the teachers, site coordinators, and principals are working at each one of these schools. It is obvious that working in today's schools with the inordinate number of mandates and pressures creates stress on educators and students, and we worry that these working conditions may be counterproductive to establishing healthy and effective opportunities for both children and educators to learn. Finding real and sustainable ways to provide emerging bilingual children opportunities to become biliterate requires having courageous conversations, the willingness to collaborate across institutions such as universities and schools, and the development of long-term relationships.

Because of the interaction of a multiplicity of factors, we cannot point to an exemplary model of Literacy Squared at any of our case study schools, nor can we fully condemn any response. Instead we situate our outcomes within the larger school, district, state, and national

context with regard to efforts aimed at educating emerging bilingual children. We welcome opportunities to continue our research and look forward to enriching dialogues that will improve our emerging bilingual learners' bilingual and biliterate development.

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Appendix A

Literacy Squared® Site Coordinator: 2011-2012 Roles and Responsibilities

- Attend research team meetings as scheduled and disseminate information from meetings to teachers and principals at intervention schools and to district officials
- Honor the time of all professional development sessions
- Assist teachers in collecting DRA2/EDL2 data at designated sites and at designated times
- Collect writing sample assessments and assist in scoring them
- Assist in organizing and scheduling professional development sessions, including meeting rooms, food, and refreshments for teachers
- Complete annual profiles of participating schools to ensure fidelity of project implementation and fulfill other monitoring obligations
- Communicate with district officials regarding project progress as necessary
- Visit intervention teachers' classrooms a minimum of 4 times per year and collect lesson plans of Spanish literacy and literacy-based ESL to ensure sufficient support for program implementation
- Co-plan, demonstrate lessons, and coach intervention teachers to ensure program implementation
- Assist in administration, registration, and approval of course requirements for university credit
- Collect parent permission forms for each child in the Literacy Squared intervention and have them readily accessible for the research team
- Respond to emails and other communication in a timely manner

Appendix B

Literacy Squared® Teachers: 2011-12 Roles and Responsibilities

- Implement the mandatory components (Spanish literacy, cross-language connections, and literacy-based ESL)
- Choose materials and plan instruction in ways that are consistent with and support Literacy Squared approaches and strategies
- Maintain minimum time allocations
- Collect EDL2/DRA2 data at designated times
- Collect writing sample assessments and assist in scoring them
- Attend all professional development sessions
- Honor the time of all professional development sessions
- Open classrooms/schools to Literacy Squared staff and visitors
- Permit lessons to be videotaped
- Collaborate with researchers, ELA specialists/site coordinators, and other teachers
- Implement The Dictado - Grades 2-5: complete at least 15 Spanish and 15 English Dictados; 1st grade: at least 15 Spanish and at least 12 English; Kinder: at least 10 Spanish; English-only strand: 30 English)
- Provide a week of lesson plans using the Literacy Squared Lesson Plan Framework for two different months (specific instructions to follow)

Appendix C

Literacy Squared® Observation Protocol

Date _____	School _____	Observer _____
Time _____	Teacher _____	Grade _____ Subject _____

SPANISH LITERACY **Scheduled _____min** **Observed _____min** **Reading** **M S SG R C WW I** **Writing** **M S C I**	**Rating**	**Domain/Indicators** - = Developing/Not Evident √ = Evident + = Exceptional N/A = Not Applicable (Only possible for italicized indicators)	**Rating**	**LITERACY-BASED ESL** **Scheduled _____min** **Observed _____min** **Reading** **M S SG R C WW I** **Writing** **M S C I**
	1 2 3 4 5	**Text Selection or Production** __ Relevant to teaching objective __ Appropriate linguistic aspects of text (syntax, vocab, etc.) __ Appropriate literary aspects (genre, contextualized, etc.) __ *Culturally and personally relevant*	1 2 3 4 5	
	1 2 3 4 5	**Literacy Objective** __ Standards based (√= Teaches to standard; + = Includes all lang domains) — Authentic to lang environment	1 2 3 4 5	
	1 2 3 4 5	**Oracy** __ Matches literacy objective __ Ss likely to encounter or use target vocab (from text and objectives) __ Opportunities to dialogue are purposeful __ S participation in dialogue is scaffolded to ensure their success __ Meaningful selection of lang structures __ Multiple opportunities for Ss to rehearse, appropriate, & respond to target lang structures __ Teacher talk v. Student talk (√= 40-60% S talk; + = 61+% S talk) __ Multiple opportunities for connected discourse __ *Specifically address register & lang variation* __ *Structured Student Talk (Think-pair-share, inside outside circles, etc.)*	1 2 3 4 5	
	1 2 3 4 5	**Accountability** __ T has high and clear S expectations __ All Ss are held accountable for actively participating in the activity/lesson __ T checks for S understanding __ T provides appropriate feedback to enhance S learning __ *All Ss are held accountable for completing their work*	1 2 3 4 5	

M=Modeled; S=Shared; SG= Teacher led sm grps; R=Repeated Reading; C=Collaborative; WW=Integrated Word Work; I=Independent
** We acknowledge that not all indicators will be present at each observation, but Ts should strive to incorporate as many as possible.

	1 2 3 4 5		**Cross-language Connections**	1 2 3 4 5	
		__	*Connection b/n literacy environments (theme, genre, standards, etc.)*	__	
		__	*Visual side-by-side analysis of languages (cognates, anchor posters, etc.)*	__	
		__	*Metalanguage*	__	
		__	*Strategic translation (Así se dice, homonym translation, etc.)*	__	
		__	*T uses languages strategically to enhance S learning (clarification, preview/review, instructions, etc.)*	__	
		__	*T flexibly responds to S's lang alternations (eg. Response to code-switching)*	__	
	1 2 3 4 5		**Student Involvement**	1 2 3 4 5	
		__	Ss are actively engaged in activity/lesson	__	
		__	Ss actively use lang related to the lesson	__	
		__	Ss communicate in whole groups or w/ peers in a way that is relevant to the lesson objective	__	
		__	*Reading*	__	
		__	*Writing (or text related drawing)*	__	
		__	*Listening*	__	
		__	*Speaking*	__	
		__	*Ss share prior knowledge or personal connections*	__	
		__	*Ss demonstrate understanding of objectives or new learning*	__	
		__	*Ss take pride in their work/learning*	__	
	1 2 3 4 5		**Lesson Delivery**	1 2 3 4 5	
		__	T clearly communicates lit obj to Ss (How)	__	
		__	T clearly communicates lit obj to Ss (Why)	__	
		__	T clearly communicates oracy objective to Ss	__	
		__	T fosters safe environment for risk taking	__	
		__	*Language specific metalanguage*	__	
		__	*T successfully scaffolds Ss literacy learning based on their needs*	__	
		__	*T explicitly models literacy and language objectives*	__	
		__	*T gradually releases responsibility to Ss in an appropriate way, allowing them to successfully meet the learning/language objective(s)*	__	
	1 2 3 4 5		**Dictado**	1 2 3 4 5	
		__	*Ss skip lines*	__	
		__	*Ss use colored pen to self-correct*	__	
		__	*Ss make self-corrections*	__	
		__	*Dictado is comprehensible & contextualized*	__	
		__	*Same Dictado 3x/week*	__	
		__	*Clear teaching points*	__	
		__	*Explicit talk through is metalinguistic*	__	
		__	*Dictado is between 15-20 minutes*	__	
		__	*Dictado has a title*	__	
		__	*T reads entire Dictado for meaning*	__	