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Developing Academic Language and Content for Emergent Bilinguals Through a Science Inquiry Unit

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There is growing evidence that schools are not meeting the needs of emergent bilinguals who are falling behind in both academic language development and content knowledge learning. In response to this concern, this article proposes five research-based guidelines for promoting effective instruction for emergent bilinguals. In order to connect theory to practice, implementation of these guidelines is explored through a descriptive study, within a qualitative paradigm, involving Jessica, a Spanish/English bilingual third-grade teacher. Through a description of her science inquiry unit on water, the authors outline how Jessica's instruction reflected the five guidelines. The analysis of her instruction revealed that Jessica developed a standards-based, challenging and enriching inquiry-based curriculum; had high expectations for all of her students and capitalized on their background knowledge and experiences; used a variety of strategies to foster the development of both language and content; created an environment that valued and supported primary language development; and focused on teaching academic language in both English and Spanish.

Jessica's third-grade class of Spanish and English bilingual students is humming with activity. At the front of the room, a bright poster with the question *How Does Water Affect our Earth*, *¿Cómo afecta el agua a nuestra tierra/nuestro planeta?* welcomes students and visitors to a world of explorations. The class has just finished watching a video on evaporation and now small groups of students are gathered around tables exploring water vapor in English. Jessica (all names are pseudonyms), known as Miss. M to her students, pours hot water into individual plastic bins and asks the students to cover them with lids. She invites the students to predict what they think will happen:

S1: I think water vapor will go up, will rise.

S2: It will evaporate.

S3: I predict that when we take the lid off it will have water on it.

S2: Why?

S1: Water vapor will condense and stick to the lid.

S3: Yes, it will be liquid again.

S2: Okay, let's write this on the graphic organizer for Miss. M.

Jessica engages her emergent bilingual students in activities that not only help them develop their language skills but also support their acquisition of essential content area knowledge. We borrow the term *emergent bilinguals* from García, Kleifgen, and Falchi (2008), who explain that

> English language learners are in fact *emergent bilinguals.* That is, through school and through acquiring English, these children become *bilingual*, able to continue to function in their home language as well as in English, their new language and that of school. When officials and educators ignore the bilingualism that these students can and often must develop through schooling in the United States, they perpetuate inequities in the education of these children. (p. 6)

The Need for Inquiry-Based Curriculum

According to current research (Collier & Thomas, 2009; Echevarria & Short, 2010; Gibbons, 2009) there are several reasons for organizing curriculum for emerging bilinguals in a way that emphasizes teaching language through content around units of inquiry. First, inquiry-based curriculum moves away from the traditional, regimented, teacher-centered instruction, or "pedagogy of poverty," that Haberman (1991) warns against. Second, it promotes hands-on experiences that provide a natural teaching-ground for building vocabulary and background knowledge for students (Fisher & Frey, 2009; Huerta & Jackson, 2010). In addition, because students can "see the big picture, the English language instruction is more comprehensible" (Freeman & Freeman, 2007, p. 70).

However, not all teachers who work with linguistically and culturally diverse students understand how to successfully support their needs (García, et al., 2008). Moreover, while the teacher's primary goal is to help emergent bilinguals achieve academically in the different content areas of the curriculum, many do not have the academic preparation to support their students' language and content development to succeed in school (Gándara & Contreras, 2009). In fact, the achievement gap between emergent bilinguals and native English speakers across the nation presents a challenge for our schools. As Olsen (2010) points out, "English learners face a double challenge of learning a new language, while mastering all the same academic content as their English fluent peers" (p. iii). Unfortunately, too many emergent bilinguals experience difficulty overcoming this challenge. Results from several large-scale assessments suggest that emergent bilinguals fall behind their native English-speaking counterparts in all grades and in all content areas (Kieffer, Lesaux, Rivera, & Francis, 2009; Wolf & Leon, 2009). As a result, a disproportionately high number of language minority students drop out of school (Gándara & Contreras, 2009).

Increasing Population

The growing number of emergent bilingual students in schools makes the goal of helping them develop language and content knowledge across the curriculum even more urgent today. In the last 20 years in the United States, the population of students who are learning English as an

additional language has grown 169% while the general enrollment of students in Grades Kindergarten through 12 has grown only 12% (Francis, Rivera, Lesaux, Kieffer, & Rivera, 2006). According to the National Clearinghouse for English Language Acquisition (2010) the increasing numbers of emergent bilinguals are moving and becoming concentrated in different areas of the United States. The largest emergent bilingual population growth has occurred in states that historically have not had many English learners. For example, from 1996 to 2006, the growth rate of emergent bilinguals in Nebraska was over 200%. Because of this, teachers from all states benefit from being prepared to work with this growing population of students.

The purpose of this article is to introduce a set of research-based guidelines that teachers may use to design and evaluate instruction for emergent bilinguals in mainstream or bilingual classrooms. We explore how the research-based guidelines can be used to identify effective instruction through an analysis of one teacher's implementation of a science inquiry unit in a dual-language school. We open the discussion with a description of the research-based guidelines for effective instruction. The methods for data collection and analysis are then presented. We use the guidelines for effective instruction as an analytical framework to dissect Jessica's science inquiry unit on water. Conclusions are drawn about the benefits of using the guidelines and need to expand the investigation of constructing instructional practice with them.

Development of the Guidelines for Promoting Effective Instruction for Emergent Bilinguals

In 2006, the National Literacy Panel on Language Minority Children and Youth completed a four-year process of identifying, assessing, and synthesizing research on the literacy attainment of emergent bilinguals. The panel found that while emergent bilinguals achieved adequate performance on measures of word recognition and spelling, they fell behind their native English-speaking peers on measures of reading comprehension and vocabulary (August & Shanahan, 2006). From our work with teachers of emergent bilinguals across the country, we know that they often see this firsthand in their classrooms. Their students do well reading the words in passages they are assigned, but often have difficulty understanding what they have read. These researchers explain that when students have difficulty with comprehension, their development of language, literacy, and content suffers.

Inspired by the panel's work (August & Shanahan, 2006), and its alarming findings, several national and international organizations have done other syntheses of current research in the field. Based on their results, they have also published position statements regarding instruction that supports the development of content and language for emergent bilinguals (International Reading Association, 2001; National Center for Education Evaluation, 2007; National Council of Teachers of English, 2008; Teachers of English to Speakers of Other Languages, 2010). These statements provide research-based findings that can guide teachers as they plan meaningful instruction for emergent bilinguals. Our review of these policy statements reveals that across the sources there were research-based recommendations that were the same,

or similar. For this study, we clustered those like recommendations into a set of guidelines. The guidelines, explained below, were used to frame our analysis of Jessica's unit. Our *guidelines for promoting effective instruction for emergent bilingual students* are:

1. Develop a standards-based, challenging, and enriching inquiry-based curriculum.
2. Have high expectations for all students, capitalizing on their background knowledge and experiences.
3. Use a variety of strategies to foster the development of both language and content.
4. Create an environment that values and supports primary language development.
5. Focus on students' academic language development in both languages.

   Develop a standards-based, challenging, and enriching inquiry-based curriculum. An enriching inquiry-based curriculum focuses on teaching language through content. Also, literacy is embedded in all content areas taught (Freeman & Freeman, 2007). Merino & Hammond (2002) explain that when teachers integrate one content area, such as science, with art, math, and language arts they promote authentic reading and writing experiences across the curriculum. This facilitates grade-level language, literacy, and content development (Freeman & Freeman, 2007). For example, if the students are learning about plants in a science unit they could (a) read fiction and nonfiction books about plants; (b) sing songs about the topic to learn and practice new vocabulary; (c) do hands-on projects including drawings and write about them, fostering literacy development; and (d) do math by measuring root and stem growth using millimeters and centimeters as their measurement unit. Moreover, units of study that include content and language standards are designed to ensure that every student will learn at high levels. Teachers plan these units by identifying the desired results of the unit in terms of student learning according to the grade-level core standards and language proficiency levels of their students, determining the acceptable evidence of learning, and designing purposeful lessons (Gottlieb, Katz, & Ernst-Slavit, 2009).

   Have high expectations for all students, capitalizing on their background knowledge and experiences. The second guideline encourages teachers to have high expectations for all of their students. Students rise to expectations and are more engaged when placed in challenging classes with quality standard-based instruction that addresses their linguistic and literacy strengths and needs (Callahan, 2005). Students, in the previous example of a science unit on plants, are guided by the teacher to engage in meaningful and academically challenging activities while learning content and developing language as they read, write, and discuss plants. High expectations also involve using sociocultural factors such as background knowledge and experiences students bring to the learning task. When curriculum connects to students' lives and makes sense to them, they become more fully invested in the lesson (Pang & Kamil, 2004; Walqui, 2000). If we consider the example unit of inquiry described above, we could say that most students may have some prior knowledge or personal experiences with plants that teachers should activate to facilitate their comprehension of reading materials and their participation in the hands-on projects.

   Use a variety of strategies to foster the development of both language and content. The third guideline proposes the use of a variety of strategies to make the language input comprehensible

and foster growth in both language and content (Rhea & Mercuri, 2006). Multiple teaching techniques are at the core of good instruction. When teachers consistently use strategies to make the language input comprehensible and to develop literacy skills for emergent bilinguals, students can later apply those skills across the curriculum (Echevarria, Vogt, & Short, 2008; Hansen-Thomas, 2008). Using the previous example about plants, teachers can model through interactive writing how to summarize the students' observation about plant growth using a germinated seed. They can also show videos or use pictures to help students better understand academic content.

Create an environment that values and supports primary language development. The fourth guideline emphasizes the use of primary language as a tool for learning in the classroom (Cummins, 1991; Proctor, Carlo, August, & Snow, 2006). Under this guideline teachers and administrators are encouraged to create a warm and caring community where primary language is supported and further developed. If students are learning about plants, some of the readings they are doing could be done in the students' primary language to build understanding of concepts and to develop the academic language of the discipline in that language.

Focus on students' academic language development in both languages. The fifth guideline focuses on teaching academic language. Schleppegrell (2009) defines academic language as "a set of linguistic *registers* that construe multiple and complex meanings at all levels and in all subjects of schooling" (p.1). She explains that "the challenges of academic registers extend far beyond learning vocabulary, . . . [and that] meaning is presented in the grammatical as well as lexical features of texts at different levels" (p. 1). In other words, to develop academic language, teachers need to teach the vocabulary of the disciplines, address the complexity of the syntax and grammatical levels of the texts, and encourage students to read from a variety of texts and write for different purposes across the curriculum (Freeman & Freeman, 2009; Johnson, 2009; Schleppegrell, 2009). For instance, through interactive read alouds, emergent bilinguals could develop listening vocabulary of academic content, reading skills, understanding of the features of informational texts, and knowledge of the academic terms about plant growth.

These principles were used as a framework to analyze content-based instruction in a dual-language bilingual classroom. In the following section we will briefly introduce the participant of the study, the data collection methods, and the process we used to analyze the data.

Methodology

The Participant

Jessica, a native of Argentina, has been teaching emergent bilinguals for seven years. She has a bilingual teaching credential and is finishing her master's in Bilingual Education with an emphasis on reading. She teaches third grade in a dual-language school in a rural area of California. The school serves mostly low socioeconomic students, most of whom speak a

language other than English. Jessica teaches in a 90/10 dual-language model program where, in kindergarten and first grade, 90% of the instruction takes place in Spanish and 10% in English. Gradually, the level of English-language instruction increases so that by third grade 30% of the instruction is in English and 70% is in Spanish. By fifth grade, half of the instruction is in English and half is delivered in Spanish. Her classroom is comprised of 21 vivacious young children of which one-third are native English speakers and two-thirds are native Spanish speakers. While it is recommended that this type of program should have a one-to-one ratio of each language group, research shows (Lindholm-Leary, 2002) that a two to one ratio is also acceptable when some of the Spanish-speaking kids are also bilingual, as they are in Jessica's classroom. Because Jessica's students are now in third grade, all of them have developed at least intermediate to advanced proficiency in both languages.

Data Collection

Descriptive qualitative studies are considered to be "an intensive, holistic description and analysis of a phenomenon or social unit" (Stake, 1995, p.65). This study consists of an explanation of Jessica's instruction of a science unit in a dual-language school. For the data collection portion of the study, the three principles of data collection presented by Yin (2003) were used: using multiple sources of data, creating a database, and maintaining a chain of evidence to increase the reliability of the information. Data analysis was based on the interpretational analysis presented by Gall, Gall, & Borg (1999). This interpretational analysis "involves a systematic set of procedures to code and classify qualitative data to ensure that important constructs of themes and patterns emerge" (p. 298).

Research Question and Subquestions

The main research question framing the study is: *In what ways does Jessica's instruction align with the guidelines for effective instruction for emergent bilinguals?* To address this question, the first author collected multiple sources of data in Jessica's classroom, including classroom observations, audio recordings of classroom interactions, teacher interviews, student work samples, and photographs. Observations were done of *instructional activities* during all types of classroom instruction: whole class, small group, and one-on-one. Freeman and Johnson (2005) define an instructional activity as an "interplay among the actions of participants that creates a meta-level of activity that is a language class in itself" (p. 75). It represents a conglomerate of participants' actions, what teacher and students do; physical, concrete objects used, and conceptual tools; what teachers

Table 1

Observation Protocol

School Site:	Grade Level:
Observer:.	Date and Time:
Observation #:	Subject Area Observed:
Teacher's name:	Topic:
Descriptive Notes:	Reflective notes:

know from courses and from students' feedback; and how they use that knowledge to inform practice. Twelve field observations of instructional activities were recorded as field notes using an observation protocol,autio and half of those were also audiotaped and transcribed to triangulate the data. Table 1 shows the observation protocol used.

Table 2

Data Collection Sources and Data Analysis Approach

Research Question	Data Sources	Data Analysis Approach
• In what ways is Jessica's instruction organized around a challenging and enriching inquiry-based curriculum?	• Observation notes • Weekly planner • Audiotaped instruction • Long-term plans for units of study • Informal interview	• Coded responses from interviews on unit planning • Traced patterns of unit delivery through the analysis of weekly planners • Coded examples of teacher understanding of interdisciplinary planning • Coded examples of unit components from audiotaped instruction and field notes
• How does Jessica capitalize on her emergent bilinguals' background knowledge and experiences?	• Observation notes • Weekly planner • Audiotaped instruction • Long-term plans for units of study • Informal interview	• Coded responses from interviews on how to use students' background knowledge (SBK) for instruction • Coded examples of the use of SBK and experiences from audiotaped instruction and field notes
• What strategies does Jessica use to foster her emergent bilinguals' development of both language and content?	• Observation notes • Audiotaped instruction • Informal interview	• Coded examples of strategies used during instruction •Tracked and analyzed teacher use of strategies during instruction and feedback from observation notes and audiotaped instruction • Coded patterns of teacher's responses to interview questions regarding strategies used
• In what ways does Jessica support the primary language of her students in her classroom?	• Observation notes • Audiotaped instruction • Informal interview	• Coded examples of language use in each language from field notes and audiotaped instruction • Identified instructional events taught in each language from classroom observations and audiotaped lessons • Identified strategies for language development use for each language
• How does Jessica foster students' academic language development of the content areas in both languages?	• Observation notes • Weekly planner • Audiotaped instruction • Informal interview	• Coded examples of academic language use from field notes and audiotaped instruction • Identified teacher's strategic teaching of the components

Data Analysis

Data analysis was conducted by both the first and second author after data collection from observation and other information sources had concluded. Using the *Guidelines for Promoting Effective Instruction for Emergent Bilinguals* as our framework, we initially read through the data to explore if connections between Jessica's classroom practice and the guidelines existed. From the research question a set of subquestions were also developed and used to organize the data analysis as shown in Table 2. Any connections found were analyzed in light of the research subquestions. A code was assigned to each of the five subquestions that aligned with each guideline. We then read through the data a second time, as well as through the coded examples of the unit of analysis and the instructional activity. Each activity was categorized under each guideline. As we continued with the analysis, we realized that each instructional activity involved more than one guideline, so some codes were aligned with all the guidelines that applied.

We proceeded to analyze a second time all the segments that had been coded to confirm the connections between Jessica's instruction and the guidelines. This analysis of the data from the observation notes and other information sources helped us conduct informal interviews with Jessica to further understand her classroom practice. All three interviews were audiotaped and transcribed for analysis. For this analysis we also used the *Guidelines for Promoting Effective Instruction for Emergent Bilinguals* as our framework. We created Table 3 to assess the ways that Jessica's unit of inquiry on water met the guidelines for promoting effective instruction for emergent bilinguals.

Table 3

Instructional Activities Aligned With Guidelines

Instructional Activity	Guidelines				
	Develop standards-based challenging and enriching inquiry-based curriculum	Have high expectations for all students capitalizing on their background knowledge and experiences	Use a variety of strategies to foster the development of both language and content	Create an environment that values and supports primary language development	Focus on students' academic language development in both languages

In the following section we discuss the findings of the study by exploring the ways in which Jessica's unit of inquiry into water aligns with the research-based guidelines for effective instruction for emergent bilinguals.

Jessica's Unit of Inquiry: An Actualization of the Concepts

Jessica's water unit shows how the development of both language and content could be integrated in teaching. In her third-grade dual-language classroom, 70% of the instructional time is in Spanish and 30% is in English. In this case, the 30% of English instruction is covered during

English literacy time and during half of science instructional time. The rest of the day is in Spanish. Her unit reflects this time allocation and the value and support she has for the students' first languages.

Overview of the Unit on Water

In order to address the state of California's grade-level standards, one of the concepts that the third-grade teachers at Jessica's school selected to explore was water. Through a unit on water titled *Water, Water, Everywhere*, Jessica's third grade students explored the following science standards (California Department of Education, 2003) shown in Table 4.

Table 4

Content Standards Covered by the Unit on Water

Science content standards	Science investigation and experimentation standard
"Energy and matter have multiple forms and can be changed from one form to another" (p. 1).	"Scientific progress is made by asking meaningful questions and conducting careful investigations" (p. 5)
"Adaptations in physical structure or behavior may improve an organism's chance for survival" (p. 3).	

This unit can be considered *interdisciplinary* because it integrates the disciplines of science, language, and, as will be discussed later, mathematics. It was also organized around an essential question: *How does water affect our Earth*? This type of open-ended question stimulates discussion among children and promotes higher-level thinking, which is important for building content knowledge for emergent bilinguals (Carin, Bass, & Contant, 2005; Goldenberg & Coleman, 2010). In addition, by answering this essential question across content areas, Jessica's emergent bilinguals have opportunities to use academic language and develop academic literacy and content knowledge in meaningful and interconnected ways (Their, 2002).

Jessica began planning the unit considering her emergent bilinguals different language proficiency levels in both Spanish and English. She identified the knowledge and skills students would need to develop in each language while studying the *Water, Water, Everywhere* unit. Three interconnected clusters of ideas were organized around the essential question *How does water affect our Earth*? The interconnected clusters were: *Wondering about Water*, *Properties of Water*, and *Water in Our Life*. During the first cluster, *Wondering about Water,* the students explored concepts that included where water comes from, bodies of water, water habitats, and water resources. The second cluster, *Properties of Water,* had a strong emphasis on hands-on learning. Throughout this cluster, students read and wrote, and did observations and interactive explorations about physical and chemical properties of water. For the duration of the last cluster, *Water in Our Life,* the students explored the water cycle, types of clouds and their formations, and water conservation. The culminating activity for the unit was a celebration of Earth Day.

Jessica carefully planned ways to assess her emergent bilinguals throughout the unit of study. Table 5 outlines some of the assessments Jessica implemented.

Table 5

Classroom Assessments for the Unit of Study

Anecdotal Notes That Focus on Oral Language	Selected Group Projects to Demonstrate Content and Language Proficiency
• Contributions in whole class discussions • Contributions during small group tasks that focused on vocabulary	• Poster presentation of properties of water/states of water • Graphic organizers • Written reports

This unit of inquiry focused on increasing emergent bilinguals' understanding about water and helping them appreciate the importance of conserving water in their houses and communities. Jessica also considered ways of enhancing students' academic language growth and expanding their linguistic repertoires in Spanish and English. She strategically planned her unit to engage her students in a variety of reading and writing activities related to water, the exploration of different concepts about water through hands-on-activities, and documentation of learning using various assessment tools. Through thoughtful planning, this comprehensive unit connects to Guideline 1. All three clusters are guided by the academic standards, and as the activities planned are research supported, they have the potential to enrich and challenge students' understandings about the topic of study.

In the following section we discuss in detail the last cluster of Jessica's science inquiry unit, and show how the different guidelines come together in Jessica's classroom through a description of the cluster titled *Water in our Life.*

Tapping into Students' Background Knowledge and Experiences

At this point in the unit, the students had learned that water has been around since before life existed on Earth; that water takes many forms, including water vapor, liquid water, and ice; and that there are different bodies of water on Earth and all are part of the water cycle. Through this last cluster, Jessica wanted her students to explore, first, the continuous movement of water in the environment through the process of evaporation, condensation, and precipitation and, second, the different ways in which water is used daily and how it can be conserved as the demand for water grows worldwide.

Jessica starts this part of the unit by gathering her students at the rug and by asking them questions in Spanish to engage them in an academic discussion: *¿Dónde encontramos agua*? (Where do we find water?), *¿De dónde viene la lluvia*? (Where does rain come from?), *¿Qué pasa con la lluvia después que cae*? (What happens to rain after it falls?), *¿Has visto vapor de agua*? (Have you seen water vapor?), *¿Dónde*? (Where?). Through this introductory instructional activity, Jessica taps into what students already know about the topic through previous learning or real life experiences, connecting her instruction to Guideline 2. The class discussion that emerges from these questions provides students with the opportunity to review concepts

learned, to clarify complex ideas, and to use academic language in meaningful and constructive ways. It is connected to Guideline 4 because it values the students' primary language, Spanish, and to Guideline 5 because it focuses on the academic language of science.

Teaching the Academic Language of Science in Two Languages

While the instructional activities focused on developing students' understanding of the different stages of the water cycle, they also provided students an opportunity to develop academic language. After the initial class discussion, Jessica read aloud the Spanish book, *El autobús mágico se salpica todo(The Magic School Bus Wet All Over*, publisher's translation) by Cole and Degen (1996), focusing on key content-specific vocabulary words such as *evaporación, precipitación, condensación, acumulación, vapor, and evaporar*. Through this activity, Jessica also connected to Guideline 2 by building background knowledge through a read-aloud. She then introduced the cognates of these words: *evaporation*, *precipitation*, *condensation,* and *accumulation.* For this unit, Jessica emphasized the study of cognates as a tool for developing text comprehension and word study. For example, she taught students that cognates that end in *-tion* in English will end in *-ción* in Spanish. They also discussed words that have the same spelling in English and Spanish, such as the word *vapor*. In this way, students developed metalinguistic awareness and expanded their vocabularies both in English and Spanish. As Jessica's activities focused on the development of academic language and content in both languages through the use of cognates, a clear connection to Guideline 5 was found. More important, through the read aloud, by teaching language through science content, and guiding the analysis of key academic terms Jessica addressed Guideline 3 as well.

Using Multiple Strategies for Language and Content Development in Spanish and English

During English literacy time, the students built on the read-aloud and vocabulary discussion that had been done previously in Spanish. As suggested by Guideline 5, this sequential language use allowed the teacher to enhance academic language development in two languages. Jessica called her students to the front of the classroom to participate in a *Water Cycle Dance.* She began by organizing the class into four groups and giving each group a sign with one of the key vocabulary words introduced through the reading. The vocabulary words on each sign corresponded to stages of the water cycle: *evaporation*, *condensation*, *precipitation,* and *accumulation*. Next, the groups were given musical instruments to represent each stage; for example, a rain stick was given to the *precipitation* group. Jessica then displayed "The Rain Song" (See Figure 1.) on the overhead projector, and played a YouTube video for students to watch and sing along with.

Using their musical instruments, the groups sang the song which included their vocabulary words. This multilayer activity offered a range of instructional paths to foster the development of both language and content, thus addressing Guideline 3. The fact that language and content development was done through multisensory activities in diverse languages, rather

than repeating activities in a different language, signaled the meaning of Guideline 1. That is, rich inquiry-based curriculum was being implemented to build, rather than just translate, students understanding of content.

Rain and snow come down, and they hit the ground,

Soak into the Earth, or they hang around.

In puddles or lakes, they **evaporate**

Up into the clouds, where they **condensate**.

Boy it's cold up there, but they're unaware

As they grab some dust, and return to us.

They **precipitate** on land and lakes and they start to

   accumulate,

It's the Water Cycle: Ain't it great?

                    Bydlowski, Kline, & Ribits (2010)

Figure 1. "The Rain Song."

To help students review what they had learned the previous day and to emphasize the acquisition of academic terms, Jessica began her second day with a read-aloud from the book *El Ciclo del Agua* by Helen Frost (2004). After the reading, Jessica reviewed the academic terms *condensación, evaporación, precipitación,* and *acumulación* and their cognates in English *condensation, evaporation, precipitation,* and *accumulation.* Through modeling, Jessica introduced the next activity. The students would create individual "pizza" charts (adapted from Montaño-Harmon, 1991) to show their understanding of the water cycle and the academic vocabulary terms in Spanish. Jessica showed the students a large tagboard circle that had been divided in fourths. On one-quarter of her pizza chart she drew a picture of water rising from a lake. On the back of that section of tagboard she wrote the word *evaporación* and a brief definition in Spanish. Next, she asked students to create their own pizza charts that would include pictures, labels, and definitions of all four stages of the water cycle. Figure 2 shows two pizza charts created by Jessica's students.

Once the charts were completed, students described the stages of the water cycle using sentence frames provided by the teacher to explain their pizza charts to the class. They summarized what they knew about the water cycle using sentence frames such as: *Yo aprendí _____ acerca del ciclo del agua.* (I learned _____ about the water cycle). *Las fases del ciclo del agua son: ____,____,____, y____* (The different stages of the water cycle are ____, ____,____ and ____). This layering of instructional events focused on the development of academic language and knowledge through the integration of literacy (reading and writing) with oracy (listening and speaking). First, the students listened to the story that Jessica read to them and to the modeling instructions of the pizza chart. Second, they wrote the different stages of the water cycle on their charts, and, finally, they shared orally what they learned through the different steps of the instructional activity. We identified multiple connections to the guidelines in this task. The teacher addressed Guideline 2 by making connections with students' prior knowledge about the

stages of the water cycle; Guideline 3 by using a multistep activity that taught academic language and science content on the water cycle; and Guideline 4 by validating students' primary language, in this case Spanish, for the Spanish speaking students in her classroom, while at the same time reinforcing native English speaking students' second language, Spanish.

At this point in the unit, the students had studied the water cycle in depth. Now, Jessica introduced the concept of water in the air or clouds. It is important to note that Jessica did not repeat lessons in each language but moved across languages by building on the previous lesson. This lesson about clouds was done in English. Jessica began the lesson by reading two books aloud: *Clouds* (Vaughan, 1997) and *Looking at Clouds* (Ring, 1999). These books discussed how clouds are made, what happens inside a cloud and how temperature affects clouds, different types of clouds, and the role of meteorologists in determining weather conditions. Through questions and answers and connections to life experiences used during these read-alouds, students discussed their new conceptual understanding of clouds.

After the read-alouds, Jessica took her students on an observation of the sky outside the classroom. With the background knowledge she had built through the readings the students were able to recognize and discuss the different types of clouds, to explain how the clouds could have been formed according to the weather conditions of the day, and to use descriptive vocabulary that they had learned to describe what they saw in the sky. Even though the lesson was done in English, the students were allowed to use their primary language during the student-student interactions outside the classroom. This scaffolding strategy was meant to help them negotiate meaning as they constructed ideas to share with others. However, the oral contributions to the whole class as well as the journal writing they did in this lesson were done in the language of instruction: English. As the students interacted in this discussion outside the classroom, they took notes in their journals about what they observed.

Figure 2. Water Cycle Pizza Chart.

Back in the classroom, Jessica asked the students to the rug area to debrief them concerning what they had experienced outside. She drew a web on the whiteboard and wrote *clouds* in the center. Then, she asked the students to share with their partner one thing that they had learned, or confirmed, from their readings during the observation on the playground. After the students shared with one another, they began sharing with the rest of the class. As students shared, Jessica compiled their answers on the web. The web required students to identify different types of clouds and to

provide a description of their characteristics. This web was then displayed on the classroom wall, serving as a scaffold for future writing. The activities in this lesson illustrate Guideline 1 by showing how students are challenged cognitively and linguistically and are reflective of the required standard-based curriculum. To clarify, this unit of study addressed the California science standard for third grade that matter has "multiple forms and can be changed from one form to another" (California Department of Education, 2003, p. 1). In addition, Guidelines 3 and 5 are evident. A combination of literacy and oracy instructional strategies were used to foster the development of both language and content. There was also a focus on students' academic language development in both languages, by allowing students to process academic knowledge through interactions using either English or Spanish.

Jessica consistently embedded literacy into the content areas or brought the topics of the content areas into the literacy time. During Spanish literacy time, Jessica expanded the knowledge students had developed about clouds in the previous lesson done in English. In the Spanish lesson, Jessica wanted to focus on word study, where students would continue to internalize and use the academic terms they had been exploring through this unit. Using a large chart, Jessica engaged the class in a shared writing activity and think-aloud as she modeled how to complete a vocabulary card. During the think-aloud she exhibited the associations she made to help her remember the meaning of a word. After the students understood the assignment, she distributed the terms *nube, estrato, cirro, cúmulo, nimbo,* and *cumulonimbo* written on big cards to each table. Students worked in pairs to complete their vocabulary cards by providing a definition, drawing a picture to represent the meaning of the word, and using the word in a sentence. Figure 3 shows a sample vocabulary card produced by one of Jessica's students.

Word	Picture
Nube	
Definition	**Sentence**
Son pequeñas gotas de agua flotando juntas en el aire.	Cuando vamos afuera y miramos al cielo vemos nubes.

Figure 3. Academic Vocabulary Development Card.

This is Javier's vocabulary card for the content-specific academic vocabulary word *cloud* (*nube*) in Spanish. Javier found a picture on the computer and pasted it onto his card. Next, he wrote out a definition. In this example, Javier's definition was: *Son pequeñas gotas de agua flotando juntas en el aire (They are small drops of water floating together in the air)*. This was not a formal dictionary definition, but rather accurate information taken from the books they were reading or from discussions the class had about the word. Finally, in order to make personal connections that would further help him remember the word, Javier wrote a sentence about the word. Here Javier wrote: *Cuando vamos afuera y miramos al cielo vemos nubes* (*When we go*

outside and we look at the sky we see clouds). Once all of the students completed their cards, they punched a hole in the corner and added it to their individual vocabulary card decks which were secured with metal rings. Through this instructional activity Jessica addressed Guideline 4, by using Spanish as the language of instruction, and Guideline 5 by focusing on the development of academic vocabulary such as *nube, estrato, cirro, cúmulo, nimbo,* etc.

The last part of the third cluster was on saving water. She organized her emergent bilinguals' inquiries about saving water into a science fair, which engaged them in critical thinking about a social issue like water conservation through instructional activities both in Spanish and English. To do this, she had students conduct research to find out about the ways that people use water for drinking, bathing, and manufacturing. As part of her Spanish instructional time and to begin this research, Jessica started by asking about students' prior knowledge and personal experiences. She wrote the question *¿Cuáles son algunas formas en que usas el agua?* (*What are some ways you use water?*) on the board to start the discussion. As the students shared their responses she recorded them in Spanish on the board. This part of the instructional event connected with Guidelines 2 and 4 by bridging student's background knowledge and personal experiences about water usage in Spanish. At the end of the oral discussion students came to the conclusion that there was not enough access to clean water for the overpopulated Earth and that people do not take good care of natural resources like water.

Next, Jessica guided the students in coming up with research questions for the classroom science fair project. The students came up with two research questions: *¿Cómo desperdiciamos el agua en la escuela y en la casa?* (*How do we waste water at school and at home?*), and *Qué podemos hacer para evitar el desperdicio de este valioso recurso natural?* (*What could we do to avoid the waste of this valuable natural resource?*). Jessica challenged her students to become aware of the problem, analyze it in critical ways, and come up with a solution demonstrating the high expectations she has for her students' academic performance in the areas of critical thinking and problem solving (Guidelines 1 and 2).

During English literacy time and to get her students started on the exploration of their questions, Jessica read the book *Water Detectives* (Alexander, 2004). The book is written in a journal format and has pictures and graphs to support the important points the writer makes. Jessica's students explored their everyday use of water, evaluated their uses of this valuable natural resource, and came up with solutions to conserve water. As an illustration of Guideline 3, this project provided students with a real-life application of science and mathematical concepts and a meaningful way to use academic language in English for real purposes. Additionally, the lesson used academic language across content areas through the readings and class discussion.

Following the format of the *Water Detectives* book, students worked in groups and collected information at school and at home about water use and waste. Through this instructional activity students read and wrote using academic language, addressing Guideline 5. Specifically, each student recorded their data in English in a small journal that Jessica created which included space for drawings or pictures clipped from magazines. Students also used prior

mathematical knowledge in their reporting of findings. In order to use the mathematical concepts needed for this project, Jessica did a quick review of measurement and graphing concepts that the students had studied a few weeks previously. This review provided the students with important tools for their research and made for an authentic interdisciplinary project. Math is sometimes difficult to integrate appropriately, but this project provided a natural real-world application of mathematical skills. As discussed above, they addressed Guideline 2 by activating prior knowledge as they reviewed concepts they knew from previous lessons.

Students collected data in English during three consecutive days. On the first day of the research project the students were water detectives at school. On the second day they collected data from their observations made at home. During class time, Jessica helped her students analyze their data, make charts and graphs, and prepare poster presentations. On the third day, the groups presented their research findings. After the group presentations and the discussion about possible solutions to the waste problems, Jessica moved her students' understanding to a higher level. Activating analytical and evaluating skills, she asked her students to evaluate whether they had adequately responded to the two research questions, *How do we waste water at school and at home?* (*¿Cómo desperdiciamos el agua en la escuela y en la casa?*) and *What could we do to change the waste of this valuable natural resource?* (*¿Qué podemos hacer para evitar el desperdicio de este valioso recurso natural?*)*.* She also asked them to compare the group presentations to identify patterns of water use and water waste. This forced students to think critically and to use language at a higher level of academic proficiency in English. Once the guided discussion was finished, Jessica invited the class to gather at the rug to create an awareness campaign for the school using the research findings from the project and to design an advertisement for the campaign. This series of instructional events illustrated Guideline 3 by focusing on both language and content learning and Guideline 5 by providing students with multiple opportunities for academic language used to foster the acquisition of the academic discourse. In our final analysis we identified that the entire project reflected the meaning of Guideline 1, since it was based on the curriculum standards for the grade and disciplines and implemented challenging and inquiry-based instructional activities.

Concluding Activities

Every thematic unit should end in a celebration of learning. Jessica's planning of the unit and its interrelated clusters of ideas made it possible to celebrate its conclusion during Earth Day. To start the lesson in Spanish, Jessica had her students watch a short video about Earth Day called *Día de la tierra* (GetGreenGlobal, 2010). This video helped students understand the importance of the celebration and make connections with the conceptual learning they had been experiencing throughout the unit. After the students watched the video and discussed its main ideas, Jessica distributed index cards to them and asked them to work in pairs to write key ideas to discuss and address during Earth Day. Students worked diligently with one another, and after they had completed their cards, they came to the front of the classroom and placed them on a web Jessica had drawn on the whiteboard. By using a video in Spanish, Jessica continued to

validate the Spanish speakers in her class (Guideline 4) as well as reinforce the transferring of content knowledge and skills across languages (Guideline 5).

In writing their key idea cards, students used academic Spanish terms such as *medio ambiente (environment)*, *recursos naturals (natural resources)*, *conservación (conservation)*, *preservación (preservation)*, *reciclar (to recyle)*, *tierra (Earth)*, *aire (air)*, *agua (water)*, *polución (pollution)*, *deforestación (deforestation)* and *capa de ozono (ozone layer)* Corresponding cognates were also discussed to build prior knowledge for the English part of this instructional event. In so doing, Jessica's instruction focused on Guideline 2, building students prior knowledge through vocabulary development, and also on Guideline 5 because of the emphasis placed on academic vocabulary in both Spanish and English.

During English literacy time, Jessica grouped the students and gave each group one of the cards on which was listed a key idea. She had the groups read from different resources about these concepts that had been introduced through the video. Jessica selected books about Earth Day at different reading levels to ensure the academic success of all her students. They read *Kids Care for the Earth* (Thompson, 2002), *Protecting the Planet* (Jerome, 2003), and *Earth Day* (Weaver & Weaver, 2004). Using the information from these readings, students were asked to propose ways to promote the celebration of Earth Day in school. Each of the four groups was assigned a rubric to follow for their creative presentation. The students used the internet, the readings provided by the teacher, and their own ideas to work on this project.

Each group of students presented their research-based creative project in English. The first group decided to develop a recycling campaign at the school. They developed a plan for how they would run the recycling campaign, assigned specific working roles to the group members, and organized a 3R (Reduce, Recycle, Reuse) campaign for a school assembly. The ultimate goal of this group was to make students aware that they can reduce waste, recycle and reuse many of the materials they use at school and at home.

The second group focused on water pollution. They became interested in this topic because their school was situated close to a park with an artificial lake where many ducks and birds lived. The students decided to write a letter to the principal asking permission to go to the park during school to do a cleanup of the lake, which was filled with trash. They planned to invite other classes and parents, and to ask stores to contribute gloves and trash bags for the cleanup. The third group focused on land conservation. The group brainstormed a list of possible ways to care for their schoolyard. First, students brainstormed the making of a series of posters to post around the school. After posters were designed, they invited the school janitor to help them create compost from the leaves, grass, flowers, and weeds collected from the playground and around the school. With his help, the students planned to make compost and then use it to help maintain the school grounds.

The last group decided to create a brochure that would inform the school community about the meaning of Earth Day and the importance of protecting the Earth's resources: land, water, and air. The students planned to distribute the brochures in every classroom and to

parents as they dropped their kids at school.

The students' projects illustrate Guidelines 3, using a variety of strategies to learn language and content, and Guideline 5, developing academic writing and using the academic vocabulary, as they created and presented their projects to the class or the school community. Through reading, writing, discussion, and meaningful research projects the students had learned important information that was useful both inside and outside the school. Most important, throughout the theme *Water, Water, Everywhere,* and more in particular in the last cluster, the students were involved in research to make them aware that their actions today impact the environment and the lives of everyone, thus supporting the significance of Guideline 1.

Conclusion

Throughout this inquiry unit, Jessica engaged her students in a balance of supported and independent reading, writing, vocabulary development, and hands-on activities to develop their knowledge about water and to develop their literacy skills. Jessica's unit addressed the research questions framed around our *Guidelines for Promoting Effective Instruction for Emergent Bilinguals*. Our analysis revealed multiple connections to the guidelines across instructional events.

A close look at Jessica's unit on water reveals that the exploration of grade-level content and the development of students' academic language and literacy skills in two languages can effectively be combined. Reflective of Guidelines 1 and 2, rather than teaching language, literacy and content in isolation, Jessica was able to integrate her students' learning through a well-developed, challenging, inquiry-based curriculum organized around standards, and was successful in holding high expectations for all her students. Because emergent bilinguals face double the work of native English speakers, in learning both language and content, addressing both through this type of unit is essential. The interconnectedness of content, academic language, and literacy skills in Jessica's unit, facilitated the improvement of one area through the improvement of the others allowing all students to be successful in her classroom.

When looking specifically at language learning, relevant to Guidelines 3, 4, and 5, Jessica was able to enhance the development of her students' first and second languages as well as their academic language. Throughout the unit, Jessica's emergent bilinguals were engaged in activities that emphasized the use of meaningful academic language across different content areas but with a focus on science. At multiple points in the unit we found evidence that Jessica scaffolded the use of various linguistic repertoires of her students in different ways. Activities ranged from reading books in both English and Spanish aligned with the language of each instructional event to facilitating students' transfer of knowledge across languages through meaningful multilayered activities. This allowed her to address the linguistic needs of both language groups in her classroom in order to keep all students challenged and engaged. As Jessica explained:

Because all activities are differentiated by language proficiency, all of the students

in my class are successful in accomplishing the learning tasks. They work together with their bilingual partners, and I provide extra support as needed as they work in their groups. My goal is that every student is engaged and motivated to learn despite his or her language ability. (Jessica, personal communication, October, 2008)

Jessica's emergent bilinguals worked in groups and pairs for different academic language activities and participated in class discussions and academic presentations in which they were expected to use the academic skills learned in all language domains.

Educators who, like Jessica, work with students learning content in a second language need to provide their students with meaningful and appropriate instruction that focuses on the development of language, literacy, and content. In this article we proposed that one way to achieve that is by using the *Guidelines for Promoting Effective Instruction for Emergent Bilinguals* as a framework for instruction. Planning and implementing curriculum that follows the suggested guidelines is both a challenge and a necessity for teachers and administrators who work with the growing population of emergent bilinguals in the United States. Further qualitative studies that illustrate how the guidelines can be successfully implemented in classrooms in a variety of content areas would contribute to the body of research that connects theory to effective practice for bilingual teachers. Such studies could serve as helpful guides for teachers. In particular, studies that closely examine growth and achievement in language, literacy, and content area knowledge of specific students through the implementation of integrated curriculum would benefit the field.

Children's Literature and Video References:

Alexander, C. (2004). *Water detectives*. Crystal Lake, IL: Rigby.

Bydlowski, D., Kline, C., & Ribits, F. (2010) The Rain Song. Retrieved from http://www.youtube.com/watch?v=Yw275056JtA

Cole, J., & Degen, B. (1996). *El autobus mágico se salpica todo.* NewYork, NY: Scholastic

Frost, H. (2004). *El ciclo del agua.* Mankato, MN: Capstone Press.

GetGreenGlobal. (2010). *Día de la tierra.* Retrieved from http://www.youtube.com/watch?v=pEJC5DxTynQ&NR=1

Jerome, K. (2003). *Protecting the planet*. Washington, DC: National Geographic.

Ring, S. (1999). *Looking at clouds*. Marlborough, MA: Newbridge Educational Publishers.

Thompson, G. (2002). *Kids care for the Earth*. Washington DC: National Geographic.

Vaughan, M. (1997). *Clouds*. Auckland, New Zealand: *Shortland Publications.*

Weaver, J., & Weaver, B. (2004). *Earth day*. Washington DC: National Geographic.

References

August, D., & Shanahan, T. (Eds.). (2006). *Developing literacy in second-language learners: Report of the national literacy panel on language minority children and youth.* Mahwah, NJ: Lawrence Erlbaum Associates.

California Department of Education (2003). *Science content standards for California public schools, kindergarten through grade twelve.* Sacramento, CA: Author.

Callahan, R. (2005). Tracking and high school English learners: Limiting opportunities to learn. *American Educational Research Journal, 42*(2), 305–328.

Carin, A. A., Bass, J. E., & Contant, T. L. (2005). *Teaching science as inquiry.* Upper Saddle River, NJ: Pearson.

Collier, V., & Thomas, W. (2009). *Educating English learners for a transformed world.* Albuquerque, NM: Dual Language Education of New Mexico Fuente Press.

Cummins, J. (1991). Interdependence of first- and second-language proficiency in bilingual children. In E. Bialystok (Ed.), *Language processing in bilingual children* (pp. 70–89). Cambridge: Cambridge University Press.

Echevarria, J., & Short, D. (2010). Programs and practices for effective sheltered content instruction. In California Department of Education (Ed.), *Improving education for English learners: Research-based approaches* (pp. 251–322). Sacramento, CA: CDE Press.

Echevarria, J., Vogt, M. E., & Short, D. (2008). *Making content comprehensible for English language learners: The SIOP® model* (3rd ed.). Boston, MA: Allyn & Bacon.

Fisher, D., & Frey, N. (2009). *Background knowledge: The missing piece of the comprehension puzzle.* Portsmouth, NH: Heinemann.

Francis, D. J., Rivera, M., Lesaux, N., Kieffer, M., & Rivera, H. (2006). *Practical guidelines for the education of English language learners: Research-based recommendations for instruction and academic interventions.* Houston, TX: Center on Instruction.

Freeman, D., & Freeman, Y. (2007). *English language learners: The essential guide.* New York, NY: Scholastic.

Freeman, Y., & Freeman, D. (2009). *Academic language for English language learners and struggling readers.* Portsmouth, NH: Heinemann.

Freeman, D., & Johnson, K. (2005). Toward linking teacher knowledge and student learning. In Diane Tedick (Ed.), *Second language teacher education. International perspectives* (pp. 73–95). Mahwah, NJ: Lawrence Erlbaum.

Gall, J., Gall, M., & Borg, W. (1999). *Applying educational research. A practical guide.* New York, NY: Longman.

Gándara, P., & Contreras, F. (2010). *The Latino education crisis: The consequences of failed social policies.* Cambridge, MA: Harvard University Press.

García, O., Kleifgen, J., & Falchi, L. (2008). *Equity in the education of Emergent Bilinguals: The case of English language learners.* Research Review Series Monograph, Campaign for Educational Equity, Teachers College, Columbia University.

Gibbons, P. (2009). *English learners, academic literacy, and thinking: Learning in the challenge zone.* Portsmouth, NH: Heinemann.

Goldenberg, C., & Coleman, R. (2010). *Promoting academic achievement among English learners: A guide to the research.* Thousand Oaks, CA: Corwin.

Gottlieb, M., Katz, A., & Ernst-Slavit, G. (2009). *Paper to Practice: Using the TESOL standards in PreK–12.* Alexandria, VA: TESOL, Inc.

Haberman, M. (1991). The pedagogy of poverty versus good teaching. KAPPAN, *73*(4), 290–294.

Hansen-Thomas, H. (2008, Summer). Sheltered instruction: Best practices for ELLs in the mainstream. *Kappa Delta Pi Record,* 165–169.

Huerta, M, & Jackson, J. (2010). Connecting literacy and science to increase achievement for English language learners. *Early Childhood Education Journal, 38*(3), 205–211.

International Reading Association. (2001). Second-language literacy instruction: A position paper by the International Reading Association (Position statement). Newark, DE: Author.

Kieffer, M., Lesaux, N., Rivera, M., & Francis, D. (2009). Accommodations for English language learners taking large-scale assessments: A meta-analysis on effectiveness and validity. *Review of Educational Research*, *79*(3), 1168–1201.

Johnson, E. (2009). *Academic language! Academic literacy!* Thousand Oaks, CA: Corwin Press.

Lindholm-Leary, K. (2002). *Dual language education.* Clevedon, England: Multilingual Matters.

Merino, B., & Hammond, L. (2002). Writing to learn: Science in the upper elementary classroom. In M. Schleppegrell, & C. Colombi (Eds.) *Developing advanced literacy in first and second languages: Meaning with power* (pp. 227–244). Mahwah, NJ: Lawrence Erlbaum

Montaño-Harmon, M. 1999. *Developing English for academic purposes*. Paper presented at the English for Academic Purposes Summer Institute. Fullerton, CA.

National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences. (2007). *Effective literacy and English language instruction for English learners in the elementary grades (IES practice guide).* Washington, DC: Author.

National Clearinghouse for English Language Acquisition (2010). The growing numbers of English learning students 1997/98–2007/08 . Retrieved from http://www.ncela.gwu.edu/files/uploads/9/growingLEP_0708.pdf

National Council of Teachers of English. (2008). English Language Learners (A Policy Research Brief produced by the National Council of Teachers of English). Urbana, IL: Author.

Olsen, L. (2010) *Reparable harm: Fulfilling the unkept promise of educational opportunity for California's long term English learners.* Long Beach, CA: Californians Together.

Pang, E. S., & Kamil, M. L. (2004). Second language issues in early literacy and instruction. Publication Series No. 1. Philadelphia, PA: Mid-Atlantic Lab for Student Success. Retrieved from http://www.temple.edu/Iss/pdf/publications/ pubs2004-1.pdf

Proctor, C. P., Carlo, M., August, D., & Snow, C. (2006). The intriguing role of Spanish language vocabulary knowledge in predicting English reading comprehension. *Journal of Educational Psychology, 98*(1), 150–169.

Rhea, D., & Mercuri, S. (2006). *Research-based strategies for English learners.* Portsmouth, NH: Heinemann.

Schleppegrell, M. J. (2009). Language in academic subject areas and classroom instruction: What is academic language and how can we teach it? Invited paper for a workshop on the role of language in school learning sponsored by The National Academy of Sciences, Menlo Park, CA., October, 2009.

Stake, R. E. (2005). Qualitative case studies. In N. K. Denzin, & Y. S. Lincoln (Eds.), *The Sage handbook of qualitative research* (3rd ed.; pp. 443–466). Thousand Oaks, CA: Sage.

Teachers of English to Speakers of Other Languages. (2010). Position paper on language and literacy development for young English language learners (ages 3–8). Position statement. Alexandra, VA: Author.

Their, M. (2002). *The new science literacy: Using language skills to help students learn science.* Portsmouth, NH: Heinemann.

Walqui, A. (2000). Strategies for success: Engaging immigrant students in secondary schools. ERIC Digest. Washington, DC: ERIC.

Wolf, M. K., & Leon, S. (2009). An investigation of the language demands in content assessments for English language learners. *Educational Assessment, 14*, 139–159.

Yin, R. K. (2003). *Case study research: Design and methods* (2nd ed.). Thousand Oaks, CA: Sage.