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INVITED ESSAY

Teaching Science to English Learners

By Barbara Merino and Robin Scarcella

Teaching science and other academic subjects to English learners (ELs) is both a challenge and an opportunity, especially at the secondary level. It is a challenge because as students reach the upper grades they face a more demanding curriculum, while they simultaneously must develop more advanced academic literacy to access this curriculum. In the case of science, this means students must master challenging science standards while learning the language of science. It is an opportunity because science can offer direct, interesting, hands-on and minds-on experiences to learn about the world, to solve problems, answer questions and, in the process, develop scientific and academic literacy.

This essay reviews effective practices for teaching science to ELs in the upper or secondary grades, which in California represents 40 percent of all ELs. First, we document the low achievement levels of ELs in science. Second, we discuss recent reforms of science education and the challenges they pose for teaching science to ELs. Third, we review the academic literacy requirements for learning science. Fourth, we analyze examples of approaches that are currently being used to teach science to ELs and highlight some effective practices.

> ***"In order to teach science to ELs effectively, teachers must simultaneously teach the requisite literacy skills for science learning and the rigorous content standards that all students must master."***

The major thesis of this essay is that in order to teach science to ELs effectively, teachers must simultaneously teach the requisite literacy skills for science learning *and* the rigorous content standards that all students must master. Many current instructional practices fail to do this, and some widespread reform models place too much emphasis on either the language aspect or the science aspect. We argue for an integrated approach and provide some examples of practices that reflect this approach. Although we focus on science in the upper grades, many of the issues and examples can be applied to teaching all academic subjects to ELs at all grade levels.

Science Achievement of English Learners

ELs lag behind their native English-speaking peers in science achievement. At the national level, only 3 percent of eighth grade ELs scored at or above the proficient level on the 2000 National Assessment of Education Progress (NAEP) in Science, compared to 32 percent of English background students. In California, only 6 percent of fifth grade ELs were deemed proficient on the 2005 California Standards Test (CST) in Science and only 40 percent scored at the basic level. In contrast, 38 percent of native English speakers were deemed proficient or advanced and 75 percent were performing at least at the basic level. Similar disparities exist in high school science subjects of biology, chemistry, and physics. It must be recognized that these test results do not inform teachers of the specific standards that ELs fail to reach. Moreover, English learner test performance is affected by the students' lack of English proficiency and may, therefore, mask the students' knowledge of content.

The Reform of Science Education

California, like many states, has undertaken a major reform of science education by adopting rigorous content standards, developing tests to assess these standards, purchasing standards-based instructional textbook programs, and supporting teacher professional development tied to the programs. The 2004 California Science Framework, the bluebook for this reform, expands upon the science content standards adopted by the State Board of Education in 1998. The CST assesses students' knowledge of science standards in Grade 5 and Grades 9-12, while The No Child Left Behind Act of 2001 requires California to measure the content knowledge of its EL students in Grades 2-12.

Standards-based instruction, a key part of these reforms, has tremendous potential. It makes much of the conceptual knowledge students need to learn transparent, provides teachers with a common language to discuss their students' progress in science courses, provides a common, equitable curriculum, and helps teachers identify and address student learning difficulties. Nevertheless, standards-based instruction presents challenges. Teachers who identify themselves as "content teachers" rather than "language specialists" may lack the preparation needed to help their ELs reach California's rigorous standards. They may feel that their EL students should have learned foundational knowledge earlier and it is not their obligation to teach them. They may not know ways to assess the adequacy of their students' foundational knowledge, or techniques to help students address gaps in this knowledge.

Another challenge concerns the complexity of the standards. Some question whether students who are not fully proficient in English can reasonably cover all of the concepts of California's science standards in depth before taking the CST. One of the main points of the Third International Mathematics and Science Study (TIMSS) suggests that it might be better for teachers to spend more time teaching fewer science concepts in depth than they do now. When science instruction in the United States was compared with that in other countries, TIMSS investigators argued that the U.S. science curricula represented a "splintered vision," since it aimed to make students familiar with many science topics instead of concentrating their knowledge on clustered topics addressing key issues. On the other hand, if EL students are not taught the same rigorous standards as native English speakers, they will continue to lag behind.

A problem occurs when providing EL students with only simplified versions of standards, and teaching them in highly contextualized ways that do not develop their knowledge of the language of science. Students need to access the cognitively advanced, decontextualized language and concepts required of the standards, so that they are prepared for rigorous science courses.

"ELs come from diverse cultural backgrounds, with different histories. Teachers need to be responsive to this diversity, address its challenges and build on its strengths."

We argue here that the science curriculum must be manageable, involving the careful organization of standards to form connections around pivotal concepts. School districts and teachers can order standards in ways that promote deep understanding of key principles and allow maximal coverage of the standards. Standards-based instruction is especially effective with English learners when teachers organize the standards within the science curriculum in a coherent way that gives students adequate time to reach them, when the language and conceptual demands that standards place upon ELs are addressed, and when connections to standards in other core subjects can reinforce science learning and language.

A related reform concerns California's science textbooks. The textbooks include readings, inquiry-based activities (including experiments), writing assignments, language supports, and standards-based formative and summative assessments. All activities and assessments are tied to specific standards; however, mere alignment with the standards is insufficient if EL students are to learn and remember new concepts and uses of language in science.

Some argue that the textbooks provide insufficient coverage or practice of the standards. In 1998, for instance, Project 2061 of the American Association of the Advancement of Science analyzed middle school and high school mathematics and science textbooks to investigate their alignment with standards and their effectiveness in helping students reach standards. Out of the 20 science texts analyzed, only one middle school stand-alone physical science unit was found to be effective, and it was not designed to meet the needs of EL students.

Teachers need to be aware of the specific language skills their students need to complete reading, writing, speaking and listening activities effectively in their science classrooms. An analysis of the science textbooks presently used in California reveals inadequate scaffolding of oral inquiry activities and writing assignments for EL students. Although The K-8th Grade Science Textbook Evaluation and Content Criteria mandate the inclusion of the instruction of language in the 2006 textbooks, these criteria are vague and offer insufficient guidance concerning the inclusion of language.

The reforms outlined above have generated statewide, national and international debates. Discussions of the nature and scope of science education can be quite polarizing but should not be. Dialogue about the breadth and depth of curricula, the need for rigorous standards, and the role of inquiry are part of the conversations of science educators everywhere. Pedagogically sound ways must be found to provide effective science instruction to EL students, including multiple types of inquiry and experimentation where high standards, carefully crafted and linked to foundational knowledge and skills, are met, and academic literacy and critical thinking skills are developed.

For students whose first exposure to English begins in secondary school, time is perhaps the biggest challenge in a high stakes testing environment where coverage of so much material is expected. ELs are a diverse group, and for many, schooling has not provided the requisite complex academic literacy skills that participation in advanced science courses requires. ELs come from diverse cultural backgrounds, with different histories of socialization, influenced by a complex interplay of factors that affect their learning. Teachers need to be responsive to this diversity, address its challenges and build on its strengths.

Academic Literacy Requirements for Learning Science

In order to learn science, students must master the academic literacy that the subject requires. At the simplest level, academic literacy is the body of knowledge, strategies and skills necessary to accomplish the academic tasks of a specific discipline in a particular context. It is a dynamic construct that must be considered anew each time teachers instruct their students.

Vocabulary is one essential component of academic literacy. Every time students study a new topic in their science classroom, they must learn the words associated with the topic and their associated grammatical features. Even though they may know the basic subject-verb agreement rules governing most commonly occurring English nouns, they still have to learn new agreement rules when they encounter new noun forms. For instance, they must learn that that the plural of *gene* is *genes* but the plural of *bacterium* is *bacteria*.

Knowing a word is complex: to understand the term stability in an ecosystem (Standard 6, Grades 9-12, Biology), for example, students must understand other important concepts (listed as Substandards 6.a-f) including biodiversity, relative rates of birth, and decomposers. Knowing a technical word in science can entail understanding whole taxonomies. Some of the specific ways words are used in science are outlined in Chart 1.

Chart 1: Types of Words Used in Science Textbooks

Type of Words	Examples
1. Technical words pertaining to science	lithosphere, convection, seismic
2. Everyday vocabulary with special meanings in science	fault, reflection, power, force, active, plate
3. Academic words used across discipline areas and often used to define technical words in science	component, constitute, stimulate, generate
4. Synonyms	shows, represents, signifies
5. Homophones	break/brake, whole/hole
6. Words that are spelled similarly and easily confused	affect/effect, breathe/breath
7. Difficult fixed and semi-fixed expressions (also called collocations)	(If...then), (If and only if...), (Given that...), (The effects of + *noun*), (The speed of + *noun*)
8. Word families (also called word derivations)	volcano/volcanic, flexible/flexibility, collide/collision/colliding

Academic literacy is more than just vocabulary; it involves dispositions and behaviors that enable students to construct their own knowledge in a reflective way and to communicate effectively in academic situations in both speaking and writing. It entails the inseparable skills of critical reading, writing, listening and speaking as well as habits of mind. Academic literacy also involves cognitive components, including higher order thinking (critical literacy), cognitive strategies, and metalinguistic knowledge.

Science classrooms require students to use language in a number of ways—to hypothesize, generalize, compare, contrast, explain, describe, define, justify, give examples, sequence, and evaluate. One way of analyzing these uses of language is by focusing on their functions. A number of researchers have developed taxonomies of the types of texts (also called genres) found in science that cover a number of factual and analytical functions and serve distinct purposes.

To illustrate, we describe a report, a type of factual genre widely used in science texts. The text begins with a question, and the answer is provided simply in the first sentence and elaborated subsequently:

When do snakes shed their skins?

Snakes shed their skins when they outgrow them. This happens continually, because snakes keep growing throughout their lives, although more slowly as they get older. The skins are discarded at regular intervals of one to three months, according to the variety of snake. During this process, which is known as sloughing, the old skin is turned back on itself, beginning at the lips and gradually revealing the new skin underneath. When sloughing has ended, the old skin will have been turned completely inside out and left in one piece. (Addison, 1988; p. 41, from *The Children's Book of Questions and Answers.)*

Note that the author uses many complex grammatical structures: the present perfect (*has ended*), passive constructions (*will have been turned*), and temporal expressions (*underlined*). The text provides an answer to the question as it relates to snakes, but also builds the students' knowledge of biology by discussing the more generalized process of "sloughing." This text is "friendly" to the reader in the way that the information is presented incrementally. A reader who has observed a snake in the act of "sloughing" who wants to know more about this process will have a very different experience with this text from one who lacks background knowledge.

Increasingly, educators and researchers recognize that there is a complex relationship between cognition and motivation in learning from text. Skill, motivation and interest are all necessary elements for the kind of sustained engagement required to be an expert reader of complex, scientific text. Teachers can provide background knowledge by giving students direct experience with snakes' sloughing to facilitate conceptual understanding. Students can be shown how complex grammatical structures are related to simpler structures, for example, "the skins are discarded" can also be presented as "the snakes discard the skins," but then students need to be told that in scientific descriptions the passive is often used for a purpose: to indicate scientific objectivity.

Knowledge of the language features, as well as the scientific concepts, of such texts is critically important to ELs' success on state and national science exams and college placement exams. These exams are written in academic language and contain many science-specific terms. Consider the following high school biology test item:

In certain breeds of dogs, deafness is due to a recessive allele (d) of a particular gene, and normal hearing is due to its dominant allele (D). What percentage of the offspring of a normal heterozygous (Dd) dog and a deaf dog (dd) would be expected to have normal hearing?

In order to understand this rather typical biology problem, ELs must understand passive structures (*would be expected*) and question formation. Learners also must have a deep understanding of how recessive and dominant alleles function in the transmission of genes, how these terms are labeled, and how this knowledge can be applied to solve a particular problem.

Failure to master the academic literacy required for success in science classes has wider negative consequences for students than failure on tests: it prevents them from engaging in the types of critical inquiry that lead to scientific discovery, deep understandings about scientific concepts, and robust scientific reasoning.

Current Approaches

Current approaches provide opportunities for science teachers to shape their instruction to the specific needs of their EL students at the same time that they challenge the teachers to implement the approaches effectively. Here we sample a few:

Sheltered Instruction and SDAIE. A number of approaches have been designed to teach EL students. Some emphasize the development of the language of science. Often implemented are Sheltered Instruction (SI) and Specially Designed Academic Instruction in English (SDAIE). Both were designed in the 1980s to make academic content comprehensible to learners while simultaneously promoting ELs' language development. SI teachers use demonstrations, visuals, pre-reading activities, graphic organizers and modified English readings to make content understandable to their students. SDAIE teachers develop their students' academic language through specially-designed activities that elicit content-specific language. These approaches emphasize generic strategies and principles for teaching language and content to ELs and shaping the instruction to learner proficiency levels. Neither was explicitly designed to help students reach rigorous science standards, and some critique the approaches for simplifying the instruction students receive.

CALLA and SIOP. Another widely used approach is the Cognitive Academic Language Learning Approach (CALLA). After analyses of the linguistic features of the language used in content texts, tests and classrooms, effective learning strategies were identified and incorporated in CALLA materials to provide direct instruction of these strategies. This approach seeks to make learners aware of how they learn most effectively, how they can enhance their own comprehension and production of academic language, and how they can continue to learn on their own outside the classroom. This generic approach assumes that teachers can identify and teach those strategies that students can use in a particular discipline and instructional context.

The SIOP Model (Sheltered Instruction Observation Protocol) has followed a similar process of development, targeting the instruction of ELs in the content areas. This model offers teachers strategies for scaffolding instruction, organizing lessons, and providing feedback.

These approaches have given less attention to the myriad *context*-specific ways the language of science is used in particular discipline activities. Not addressed are the more *content*-specific, complex uses of the language of science that must be integrated with the development of the knowledge of the discipline. For instance, the specific language that is required to participate in oral and written inquiry activities is not delineated. Unless students are provided with specific scaffolded instruction tied to inquiry-based activities, it is not likely that their language and conceptual development will be accelerated. Models that do attempt to address the issue of integrating content and language in complex science activities have typically been designed for younger children and do not specifically address the ways teachers can work explicitly to address the needs of EL students or the ways content and language instruction help students reach specific standards.

Focused Approach. In a more integrated "architectural approach," widely referred to as the Focused Approach, academic language is described as composed of functions (tasks) such as explaining; forms (tools) such as parts of speech and vocabulary; and fluency (or levels of proficiency, from beginning to advanced). Three key components for language development are featured: systematic instruction, front-loading (teaching in advance of participating in instructional activities), and maximizing the teachable moment. One major advantage of this approach is the layered structure that allows teachers and learners to tackle a complex set of constructs. One limitation is that more complex uses of language, such as those required in building a scientific argument as part of the process of inquiry, require integration of academic literacy within the discipline of science at a deeper level and cannot be applied generically.

Sorely missing in these generic approaches has been an explicit plan to accelerate EL learning in the major contexts in which students use language in science classes.

Group Work. Group work has long been used to teach science to all students, but to EL students especially. In effective group work in the science classroom, teachers do more than simply put students together to complete projects. A specific type of group work fosters higher-order thinking skills linked to individual and group accountability. Teachers train students to cooperate in the completion of specific learning tasks, taking on specific roles to run their own groups. They learn to recognize and manage interactional problems, persuading students that all can make valuable contributions to multiple-ability tasks. Such group work is productive when

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teachers ensure that EL students take on a variety of roles and complete tasks that promote both scientific knowledge and language development.

One challenge teachers face when using this instructional practice is that once students are grouped, it is difficult to encourage them to use academic English. There is a tendency for the EL students to use an informal variety of English or learner language. Many ELs reach the early intermediate or intermediate level of English proficiency and stay at that level. At this level students can engage in simple social conversations but not in academic uses of language such as debating the merits of an argument. The students lack the language of science and simply putting them in groups with other ELs who lack this variety of language does nothing to ensure its acquisition. Another challenge of group work concerns student roles. There is a tendency to give students who are not fully proficient in academic English less challenging roles than their peers who are more proficient; however, unless students switch roles, the less proficient student does not develop more proficiency in academic English.

Much depends on the teachers' goals. Teachers may not always be concerned with the development of academic English literacy and wish to focus instead on the development of conceptual knowledge and scientific reasoning. In this situation, teachers can structure groups so that the students' first language is used as an additional resource, or organize students into groups in which the students use their first language and more proficient speakers of English communicate the insights contributed in the group's first language to the rest of the class.

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Group work is especially helpful to ELs when teachers scaffold it carefully to help ELs reach the particular science standards and academic literacy objectives with which they grapple, hold students individually accountable for completing group work effectively, and monitor and nurture the development of effective group and communication skills.

Inquiry-Based Learning. Inquiry-based learning is also widely used to teach ELs. It is essential if students are to obtain a thorough understanding of the experimentation and investigation standards. This type of learning entails hands-on activities in which students make observations, collect and analyze quantitative data, replicating research or exploring new questions. It can entail both oral language activities and writing. It poses challenges for teachers since its successful use requires careful scaffolding of academic literacy and concept knowledge in ways that help learners reach the science content standards.

Many argue that inquiry can be used effectively to explicitly teach the discourse of scientific argument. They make the case that teachers of science must teach argument explicitly if students are to understand how evaluative criteria are used to establish scientific theories and if we want to promote a common understanding of science and scientific literacy.

Building on an example provided by Atkin (2002), we present a scenario of "scaffolded" inquiry in a class of high school juniors of diverse proficiency conducting an environmental analysis project surveying living organisms in a piece of land proposed as a future parking lot. The class is organized into groups, each investigating some aspect of the issue. Determining the range of plant species living on the lot is the focus of one group; the range of animal species is another's. Formative assessment and instruction can be woven throughout the project, in indirect and direct ways, through teachers' questions about how students can consider how to study different parts of the lot, and through models of how scientists do this work.

The methods and skills of scientific inquiry are learned in the context of the key concepts students are supposed to be mastering. Students are taught how to design their project to answer a focused question. They are taught measurement methods to help them with their observations. They are taught both the language and skills of measurements and of analysis. They are taught how to record and discuss their findings and how to weigh evidence and construct an argument to support their conclusions.

In such inquiry projects, the goals and concepts to be learned must be clear to the teacher and the students. The steps for moving through the project must be carefully sequenced and monitored, so that teachers know what students know and what they need to learn to accomplish each step. Teachers must ensure that EL students have the opportunity to master academic literacy demands presented by the inquiry, from understanding how to respond to the questions posed by the teacher to move the inquiry along, to reporting the procedures used to gather data and provide a scientific description of the site.

Inquiry may be taught through a continuum of activities, some more involved than others, but whether inquiry takes shape as an experiment or as a project, teachers must be mindful of both the science and the language of science they seek to develop.

A question might arise concerning the amount of time teachers should devote to inquiry-based activities. Some educators have advocated a commitment to inquiry above all else, in what some have labeled "radical or pure" constructivism. In one noteworthy example with middle school Haitian students, researchers and teachers helped students explore the water quality of water fountains at different levels of their school building. This kind of exclusive emphasis on inquiry, however, requires significant effort, may be difficult to launch in classrooms with many students, and may be overly time-consuming.

Others prefer an innovative alternative, the use of "sheltered constructivism" in which students can participate first in structured inquiry, scaffolded both in terms of language and content, and are subsequently given a chance to explore open-ended inquiry where students can design their own investigations, for example, learning the key concepts involved in designing a solar oven by actually designing one prototype and then having students explore various designs in groups to come up with their own designs.

In the sheltered inquiry, students learn key concepts such as "reflection" through structured experiences such as testing the heat in cars of different colors. Students explore the application of this knowledge by first replicating one model to test out and then developing designs of their own. The language and content demands are reduced through the initial modeling and replication activities, but students get to subsequently engage in their own creative inquiry, and can then recycle key concepts and language through repeated experiences as they report their procedures and interpret their findings on the effectiveness of their models.

Implications for Teachers

To summarize: What works for EL students? Many of the instructional approaches we have described can be effective in teaching English learners, at least in part, when their limitations are offset by carefully constructed lesson plans. But rigorous science must be integrated with explicit instruction of academic literacy and attention given to both.

Here we target practical recommendations, supported by research, with a few focused examples that illustrate their thrust. These recommendations represent the ideal; given the realities of most instructional situations in California, it may not be feasible for teachers to follow all of them.

- *Deliberately and systematically guide ELs' progressive use of the full range of the language of science in reading, writing, speaking and listening.* For example, provide explicit instruction on the ways scientists construct evidence-based arguments in their writing and speech. Give students an opportunity to present their findings and support them with data, in small groups and as a mini-conference to the whole class, monitoring the merits of the evidence.

- *Use interventions that develop the language necessary to complete tasks in science,* not only the content-specific vocabulary and academic words, but also the functions required to produce the texts of science—descriptions, procedures, and so on. A wide array of strategies provide useful means of "scaffolding" the development of language, from "front-loading"—providing explicit instruction on the language necessary to complete a task prior to instruction—to "providing templates or models" in guiding student oral and written production. For instance, teachers can give students specific templates that help them report findings from an experiment as they reflect on the key concepts gleaned from that experiment.

- *Focus on accelerating ELs' knowledge of concepts and vocabulary in multiple ways*, for instance, by using learning strategies, explicit, structured instruction, scaffolding, group learning and computer instruction.

- *Provide ELs with additional time to learn the language of science.* For example, give students instruction before and after school, in Saturday academies, in summer school, in supplementary homework assignments, in tutorials and in computer-based activities.

- *Help ELs reach rigorous grade-level standards by assessing their knowledge of requisite language and conceptual knowledge and teaching them foundational knowledge at the beginning of each unit.* For instance, if students are asked to trace diagrams of the water cycle (Grade 5, Standard 3), teachers can assess whether their students understand key terms—water vapor and condensation—even though such concepts were taught in an earlier grade.

- *Teach effective study skills*, including note-taking skills, the use of graphic organizers (such as spider concept maps, hierarchy concept maps, and flowcharts), summarizing, questioning strategies, and mnemonics—all of which can increase the speed in which students learn language and concepts.

- *Teach the language of high stakes assessments before the students take them.* For instance, when using formative assessment, teachers can give their students sample questions modeled after the types of questions given in the CST and help students learn typical language used in the questions.

- *Provide structured and meaningful activities* that call on students to use their science textbooks and technology resources to build language skills and knowledge of science. For example, ask students to explore texts for specific purposes, such as to find tools for measurement of weather data.

- *Integrate the instruction of science content and academic language in meaningful ways* that show students how mastery of both can make a difference in their lives. For example, using the case method, teach students how scientists explore a question, how they use language to report and challenge their findings, and how these findings have an impact on society.

- *Provide formative assessment and sufficient and supportive feedback to identify students' language strengths and weaknesses.* For example, use rubrics that illustrate the features targeted for instruction in written assignments.

Implications for Policy Makers

Teachers should not be solely responsible for teaching rigorous science to English learners; policy makers must—at a minimum—do the following: (1) ensure that science teachers of ELs are provided with opportunities for ongoing professional development focused on effective integrated instruction of science and academic literacy; (2) support research on policy initiatives already implemented, for example, on the quality of the standards and assessment tools; (3) provide incentives to recruit talented people to enter the teaching profession; (4) encourage research that documents effective instructional practices for ELs tied to teaching specific science standards in particular settings; (5) re-evaluate the knowledge and experiences that teachers need in order to effectively support the learning of ELs in upper-grade, mainstream science classrooms; and (6) mandate a new generation of textbooks that not only are aligned to the standards, but also scaffold both content and language learning in speaking and writing as well as in reading.

Conclusion

English learners need to experience the excitement of science, the journey from inquiry to discovery, while at the same time learning how to communicate their discoveries in the language of science. This is a significant challenge. Teachers and researchers must find more effective ways of teaching science to ELs, particularly in the competitive environment of American high schools. Lessons for further research may come from the experiences of teachers working with ELs who use a range of activities—including group work and inquiry.

Whatever the instructional practice, a significant part of the instruction must focus explicitly on the development of academic literacy; English learners and indeed, all students, will benefit.

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Robin Scarcella *is Director of the Program in Academic English/ESL and Professor of Humanities at UC Irvine.*

Both authors serve on the UC LMRI Faculty Steering Committee.

Further Reading:

Atkin, M. (2002). Using assessment to help students learn. In R. Bybee (Ed.) *Learning Science and the Science of Learning.* (pp. 97-103) Arlington, VA: NSTA Press.

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LMRI News

UC LMRI Research Grants Call for Proposals
Deadline: October 1, 2005

UC LMRI's October Call for Proposals offers Individual Research Grants for UC researchers (one year awards of up to $25,000) and Dissertation Research Grants for UC graduate students (one year awards of up to $15,000). Please visit the UC LMRI web site for further information.

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Updated Web Site

This fall, the UC LMRI web site (*http://www.lmri.ucsb.edu*) will unveil an updated appearance. The new look includes a more comprehensive drop-down menu for easier site navigation, easier accessibility to non-LMRI content, and several new features, including new pages for the Education Policy Center, Resources, News, and a Spanish language resource page, En Español.

Please note that the URLs (web site addresses) for most of the UC LMRI pages will change; you may need to update your bookmarks.

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2006 Annual Conference

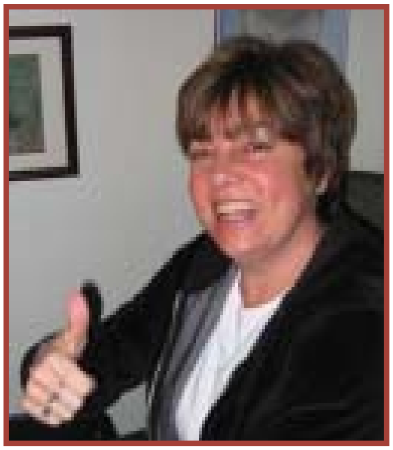
The dates and location for the 2006 UC LMRI Annual Conference have been set for May 5-6, 2006 at the Hilton Irvine/Orange County Airport hotel in Irvine, CA. Updated information as it becomes available can be found on the LMRI web site.

* * *

Staff Member Weds

On July 9, 2005, UC LMRI's Management Services Officer, Briana Viscarra, married Christian Villaseñor, UCSB Assistant Director of Admissions, Transfer Services. Although her email address remains the same (*briana@lmri.ucsb.edu*), for future reference please make note of her name change to Briana Villaseñor.

In Memorium: Sabrina Tuyay, 1962-2005



On June 30, 2005 more than 300 people gathered at the University of California in Santa Barbara to mourn the death and celebrate the life of Dr. Sabrina Tuyay, who for the past 12 years was a cornerstone of the UCSB Teacher Education Program.

Sabrina received a 1993-94 Title VII Fellowship from UC LMRI, and completed her Ph.D. in 2000. She began her career as a bilingual elementary school teacher, teaching in three different school districts in California. Two of her former third graders, now successful young women, attended the celebration of her life, giving testament to the efficacy of Sabrina's teaching and her unwavering belief in the potential of each of her students.

For Sabrina, teaching mattered. Learning mattered. For her, there had to be a viable response to the question, "So what?" And, like any good teacher, she wanted her students to find their own answers to that question. In October 2004, Sabrina was honored as the first recipient of the UCSB Gevirtz Graduate School of Education Outstanding Alumna Award for Teaching. In her acceptance speech she said, "Students need teachers who are critical thinkers, risk takers, and leaders who are willing to push the boundaries and pursue the possibilities. They need educators who not only say that all students can learn, but who are willing to take the necessary steps to ensure that it happens every day."

Sabrina's friends have established a memorial fund for her family, details of which are available on a web site they created "to share thoughts, special memories, or ways your life has been touched by Sabrina" (*http://www.memorypost.com/post.php?id=313*).

—Ann Lippincott
Associate Director, Teacher Education Program
University of California, Santa Barbara

Reports in This Issue

Complete copies of **LMRI-funded Final Grant Reports** can be found on the UC LMRI web site. (Abstracts featured in the newsletter are edited for space considerations.)

Dissertation Grant Reports can be found on the UMI ProQuest Digital Dissertations Database at: http://wwwlib.umi.com/dissertations/fullcit/9993004.

Back Issues: Newsletters from 1992 to the present are archived on the UC LMRI web site. A limited number of hard copies are available by request.

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