I'm going to talk about a program that we call Word Generation. You'll note that I don't have the standard CREATE PowerPoint format, and that was intentional. It was intentional because this work actually began before CREATE was funded, and was initiated in another context. It began in the context of Strategic Education Research Partnership, and aspects of it are getting folded into the CREATE agenda. So I'll talk about that a little bit.

Really, what I'm interested in, ultimately, is that kids be able to read books with enjoyment while lying in a hammock under elm trees. I'm going to talk about vocabulary and I'm going to talk about some very specific techniques for teaching vocabulary, not because I think vocabulary is an end in itself but rather because it is the gateway to being able to read with pleasure and enjoyment and engagement.

Having listened to the talks presented over the last day and a half, I think it's clear that there are some convergent themes, some of which emerged as well in Sylvia's talk that you just heard. What we want to do in promoting better outcomes for English language learners, and for English only kids who are not in language-rich environments and who share many of the same challenges, is we want to integrate teaching language, and teaching about language, with teaching content. There's no time to do it any other way, quite frankly, but also teaching content is, as Mary Schleppegrell described this morning, a context for teaching deeply and richly about language.

Harkening back to Guadalupe Valdes's opening talk, I don't think we want to make a sharp distinction between explicit teaching and embedded or more natural approaches to teaching. We could start, once again, a set of wars about different ways to do it; that would not help us at all. What we really want to do is think of explicit teaching and embedded teaching as end points of a continuum. That means integrating strategies from naturalistic and involved and embedded teaching with direct and explicit teaching when it's useful and appropriate.

I think a lot of people here have emphasized the notion that there's some disciplinary respectability that we've got to acknowledge; if you're teaching history, you should really be teaching history; if you're teaching science, you should authentically be teaching science. And we don't want to subvert any of those goals for goals of teaching language skills. But, at the same time, one of the things that I'm trying to do – and this is why this talk doesn't fit perfectly into this session, which is supposed to

focus on social studies – is build coherence across the content areas. And I'll talk about how we try to do that. Word Generation is not a program that is exclusive to history; it's a program that we try to get implemented across all of the content areas in middle schools because of the importance of reinforcing learning about words and how they're used across different contexts.

A message we heard from Aída Walqui yesterday and from Mary Schleppegrell today, and that we saw an example of in Sylvia's talk, is that you don't get anywhere by simplifying; you have to amplify and then create handholds for kids. And, obviously, the learning has to be engaging. Well, we approach the business of engagement by stepping outside the curriculum and adding new topics into the curriculum rather than trying to work with curricular materials that were already in place. Part of the reason for that is that we've been doing this work in Boston, which is a very decentralized district. Different middle schools within Boston have chosen different curricula and so we couldn't very well design a general program by remaining very specifically tied to pre-existing curricula.

Also, when we introduced this program to middle schools, they said, "We want to do it with the whole school" so that meant we have 6th, 7th, and 8th graders all doing the same thing. Once again, that approach undercuts the notion that you can link the program very explicitly to pre-existing curricular content. What is the program? Well, it's an attempt to link vocabulary teaching to other domains of language learning with a focus on interesting topics. Why? Because when we did a survey in the Boston Public Schools with middle school teachers, we asked: "You tell us your kids are having trouble reading. What's the biggest problem?" The teachers all put vocabulary and background knowledge pretty far up the list of priorities.

So we said, "Okay, vocabulary and background knowledge. If that's what teachers want, then that's what teachers should get." From a researcher's point of view, vocabulary is, of course, very important because it's related to all of the different components of reading well. If you don't know a word, it's hard to pronounce it and read it accurately. If you're struggling to sound it out, that reduces fluency, which again, reduces comprehension. As Mary Schleppegrell showed very clearly, one of the things that you know when you know a word is how it fits into different syntactic constructions. Furthermore, words are carriers for background knowledge. If you know the word "gravity," you know something about one

aspect of physics. If you know the word "constitution," you know something about one aspect of history. So those are pretty important consequences of word knowledge.

Why teach vocabulary? Well, I think vocabulary is a sort of a Trojan horse: for improved reading, for improved writing, for improved classroom discussion skills, classroom interaction skills, for world knowledge, and for a skill that is very important but somewhat underemphasized, namely academic language. Academic language is the capacity for academic self-presentation -- self-presentation as a member of an academic community. We see this, to anticipate a little bit, in the essays, the paragraphs the kids write in our program, when they start using these academic words that we've taught them. One such academic word, in a paragraph, creates the impression of academic presentation. The kid writes, misspelled perhaps, "My hypothesis is that global warming will get better if…" And you think, "oh, gosh, it's so much more impressive than 'I think that….'" So this business of participating in academic discourse can be signaled quite easily; it doesn't take a lot of words to create that positive impact.

All right, why middle school? Well, as I said, this work all started as part of the Strategic Education Research Partnership (SERP), which you can read about at the website, www.serpinstitute.org. SERP is an attempt to do educational research in a new, more collaborative way, in the context of long-term partnerships between groups of researchers and school districts, in my case the Boston Public Schools. One of the SERP principles is: You start with the most urgent problem as defined by the practitioners, not the most urgent problem that emerges from reading the research literature. The most urgent problem, as defined by the superintendent when we started this work, was middle school. He said "I have no idea what to do. I know that kids enter middle school reading at a certain level, and they exit middle school reading school reading at pretty much the same level, and we don't know why they don't improve more. So could you help us figure that out?" That's why we started in middle school but, of course, it's also true that reading for learning becomes a much more urgent task in middle school than it is in the elementary school. Intervening in middle school is perhaps our last good chance to get the strugglers before they're really ripe for dropout.

Then, finally, the crass motive: CREATE is focused on middle schools students. More money? Okay, we can do this! But I think it's also clear, and this is another SERP principle, if you want the work to

have purchase, have long-term impact, you've got to think about the school structure as well as instructional design, and this is particularly true in middle schools. One of the basic SERP principles is we've got to work on student learning, teacher learning, and school organization simultaneously. That's one reason why we constructed Word Generation as a school-wide program or cross-content area program—to try to influence the level of collaboration across the school.

Furthermore, teacher demands in middle school were very clear. We talked to dozens of math and social studies and science teachers who said, "Look, we know that the kids don't know the words in the books but we don't know how to teach those words." Some of them even said, "It's because the English language arts teacher isn't teaching those words." And, we said, "Well, I'm not sure that's the English language arts teacher's task; there are words the English language arts teacher needs to teach but they aren't the words you are worried about kids not knowing." Furthermore, there is no place to teach this sort of academic vocabulary--words that some kids acquire on their own and other kids don't ever get access to.

We started working in Boston in 2004. We spent a year doing surveys, talking to people, interviewing teachers and administrators, doing observations in classrooms. As I say, we heard this message about vocabulary being the big problem but we also did assessments with kids and confirmed that, on average, the students in Boston -- like urban kids in general, like former ELLs, and like current ELLs -- had vocabulary skills that were lower than their word reading skills; the word reading skills were not too bad for a large proportion of the kids. We observed in classrooms and we observed teachers not teaching vocabulary very much. When they did teach vocabulary, they taught the words that were bolded in their textbooks. "Photosynthesis is a process of converting solar energy into nutrition." That's really helpful if you know what "process," "converting," "solar," "energy," and "nutrition" mean. But if you don't know even two or three of those words, you're not helped by that glossary definition.

These all-purpose words are really crucial for understanding texts across the content areas. It's clear that the texts that the kids are reading are often too difficult for them. They're not always super engaging. We didn't see much in the way of lively classroom discussion. So those were all things we tried to address in designing Word Generation.

The program goals of Word Generation are, at the student level, to build knowledge of high-frequency academic words and to use vocabulary teaching as a Trojan horse for improving reading, writing, classroom discussion, and world knowledge. At the teacher level, the goal is to demonstrate with some very simple, brief lessons useable techniques for teaching vocabulary that could be applied to other words that they might encounter and that their kids needed to know. And at the school level, the goal is to facilitate faculty collaboration and recreate the focus that middle schools often lose on teaching kids instead of teaching content areas.

Clearly, this work is based on a lot of research that many, many colleagues and predecessors have done. I will not specify the warrants for each of the claims documented here about principles of vocabulary instruction, but they are all based in research. Just like picking big ideas in science or in social studies, you've got to pick the right words to teach. With all due respect to the English language arts teachers in the audience, the words you need to read novels are not the big and important words. I mean, *lugubrious* and *hirsute* are really nice words but they don't get you anywhere in your science or history text.

These words have got to be presented in semantically rich contexts because they are words that are very deep in meaning, that have lots of different meanings. Mary Schleppegrell's example of "pass" demonstrates this. "Pass" is short and easy to read but, boy, does it have a lot of different meanings, which vaguely overlap but not but really, and are thus hard to figure out. Another example is the words "admit," "I admit you're right" versus "Admit to the Union;" these meanings are not unconnected but still, you really need some explicit exploration of relationships like that.

We provide learner-friendly definitions. We know the dictionary definitions don't work and we know that learner-friendly definitions have to be limited in meaning. Also, we try not to provide them until the kids have talked about the words. We try to get the students to generate their own definitions first.

Ensure recurrent exposures. I'll show you some data suggesting it takes a lot of exposures to a word to learn it. Encourage experimentation; expect mistakes. You can't expect kids to use these words correctly the first time. Expand the word's semantic mapping in a planful way by figuring out how it will be encountered in specific contexts. Provide kids opportunities to use the words, teach some word-learning

strategies like morphology and cognate use and understanding when contextual information is helpful, and cultivate a sort of a word awareness that might help them extract more information from the environment.

In the middle grades, vocabulary teaching is harder, in a way, because the kids already know the easy words. Kids who know how to read well and like to read are learning academic words from reading. For kids who aren't good readers or who aren't eager readers, we've got to somehow create an oral language environment that will substitute, to some extent, for all of that exposure that might come from reading 10 million words of text in the course of a year. Clearly, students need the content area technical terms like "photosynthesis" and "constitution" but they also need the all-purpose academic words that are helpful, that are crucial in defining those content area terms.

When I say "all purpose academic words," I mean words like those on this slide: words for thinking, words like "hypothesize," "consider," "evidence," "criterion," words for classifying like "vehicle" or "process," words that are used to talk about communication, "deny, "affirm, "contend," "dispute," words that express relationships like "dominate" or "locate" or "represent." These are all words that come from the Academic Word List, which was the source of the words that we decided to teach to middle school students.

Now, I want to say I've been involved in previous efforts along these lines. For instance, the Vocabulary Improvement Project; Diane August and Mario Carlo and Barry McLaughlin and various other people and I devised a vocabulary curriculum focused on social studies specifically, and focused on Spanish-speaking English language learners. Certainly, I learned a lot from doing that work. Part of what I learned is that in order to institutionalize these innovations, a major mechanism is to ensure that teachers have techniques that are transferable to other contexts. In other words, the content of the vocabulary curriculum isn't so crucial; rather, a good vocabulary curriculum is learning the words that you are encountering anyway rather than a list of words that somebody has pulled off a website. The Vocabulary Improvement Program (VIP) was a curricular approach and I see Word Generation as a next step, although the VIP approach is good too if you have nothing else to do.

What did we do with Word Generation? Well, a summer ago, we spent an intensive period of time talking to teachers and working with some very smart doctoral students and former curriculum designers to develop a 20-week curriculum which was implemented this last academic year (2006-2007) in two schools. The two schools used it in grades six through eight, and one fifth grade teacher who was involved in the design project and was very eager decided to try it out in her fifth grade classroom.

We did pre- and post-testing, we collected weekly writing samples from the kids and, now, we have designed year two of the curriculum and are starting implementation in about a week. I should probably get home. Here are the features of Word Generation. The words are selected from the academic word list. They are presented in the context of a paragraph because lists don't work; you really want semantically rich contexts. Then there are activities designed for English language arts, for math, for social studies, and for science in which those same words get used in ways that are respectable disciplinarily but enhancements to the curriculum in any of those areas. And the school has to get together and decide how to do it. "All right. On Tuesday, it's the math teacher who does it. On Wednesday, it's the English language arts teacher who does the word study piece. On Thursday, it's the science teacher. Okay?" And on Friday, the students are always asked to write a paragraph themselves. Now, the paragraph in which the words are presented are little dilemma paragraphs. They present controversies. There's an example in your book but it's always of a form like "The incidence of obesity in the American public is rising. With it, diabetes and other health problems are increasing. In light of increasing obesity, also among school children, what should schools do? Should schools just teach more about good nutrition and health or should they eliminate junk foods from the cafeteria? Should they…" So the paragraph offers different possible solutions but no answer. And the idea is that the students are meant to discuss and develop their own answer to these dilemmas.

This is just an example of how we did this. The paragraph introduces the words on Monday. The teachers have to read the paragraph with the kids because they often cannot access it all on their own, and introduce the words. On Tuesday, Wednesday, and Thursday, some teacher does some content area activity. On Friday, there's writing. And the controversies range from things like "Should schools

have dress codes and uniforms?" "What should happen to athletes who use steroids?" "Is there such a thing as American culture?" and so forth.

For year two, we've devised it a little differently. We've got a year-long theme, which is 'Joining the National Conversation.' The introductory paragraphs are explicitly organized to be presented in math, in science and social studies or in English language arts. Two of the five words presented each week are topic-related. For example, "Stem cell research, should it be funded by the government or not? Should it be allowed or not?" *Embryonic* is a word that gets taught there because it's linked to the topic.

Examples of the mid-week activities: in every case, we identify content area specific uses of the word, so if the word is "constitution," you could image what a social studies lesson might be. And we give some very easy activities for the teachers to use, like a cloze passage. But we also give more challenging ideas for the teachers who are more engaged. For example, in social studies, "Organize a debate in the following way." Or in math, the problem of the week.

Let me just very quickly give you some information about the two schools in which we piloted this, the Westfield and the Reilley. They are Boston Public Schools with all of the standard mix of what you would expect in the Boston Public Schools. And the Westfield is, just to summarize these data, not doing very well. Half the kids at the Westfield on the GRADE test of reading score in the at-risk domain, and 25 percent of the kids at the Westfield failed the English language arts statewide assessment. The Reilley is doing much better. Only 30 percent are at risk for reading failure and only five percent on average failed the English language arts assessment. We do a pre-test that looks like this. It's a multiple choice test. It doesn't get very deeply into word meaning but it gives us a sense of whether the kids know the words or not.

One of the things that we can show the schools that is very important to them is that kids who know fewer than 80 percent of the words in this pre-test, those are the two sets of columns on the right, are very likely to be in "needs improvement" or "failing" on the statewide achievement. You've got to know 80 percent of these words to be scoring proficient or advanced on our statewide achievement test. So it seems we've picked the right words.

We have a lot of evidence that these tests work pretty well. The psychometric properties are good but, of course, the question of interest: Is there any evidence that the intervention works? This is a more complicated table than it needs to be because I just wanted to confess that we started looking at pre- and post-comparison with our test that had 30 words on it chosen from across 20 weeks of the curriculum and those are the results of the 6th grade. At the Westfield, kids went from 62 to 68 percent, a significant difference and at 7th grade, from 65 to 75. Significant effects across the board, and then I suddenly – I woke up in the middle of the night one night and said to myself, "Well, this is stupid. You're testing 30 words from all 20 weeks and the kids only got 12 weeks of the curriculum. Maybe you should look at the words they actually got taught." So that's what's on the right-hand side. And you see that the difference between the pre-test and the post-test is quite a bit bigger and, in fact, what I've bolded here on the right shows that if you look only the words that were taught, the kids in 6th grade, by the end of 12 weeks, end up scoring higher than the kids in 8th grade at the beginning of the year. So you've kind of – you've folded two years' worth of natural exposure in learning into 12 weeks of curriculum.

For those of you who are interested in effect sizes, here are the effect sizes.   David explained effect size yesterday, I'm sure you got that lesson. An effect size close to 1 is a very, very big one. We were pretty pleased that we got effect sizes as large as we did, given that this was a pilot and that we absolutely acknowledge there were many, many failures of fidelity in the implementation of this program in the first year as well as failures of design. But, nonetheless, I think these are both statistically and educationally significant effects. Even more importantly, teachers really liked this program. They said this was doable. Some of them complained but, mostly, they said, "It's really fun. The kids really like it. They like talking about these topics. They like reading about these topics. They get engaged in this information."

Let me just show you very quickly some results from a single 5th grade classroom that was studied with some intensity by Sarah Meacham and Jeannette Mancilla-Martinez. This is a 5th grade classroom in a school which is 99 percent Latino and in which a lot of kids are still classified as Limited English Proficient up through about 4th grade. By 5th grade, there are no kids still so classified. Almost every single kid in this 5th grade classroom is a former ELL. Ms. Rosen, the 5th grade teacher,

implemented the entire program. She did it all; she has a self-contained classroom. We did some intensive video taping and observation and collection of student writing assignments. The teacher, Ms. Rosen, did it this way and she really invented some of this and because she was working with former ELLs, we wanted to study her carefully, because she's a source of great ideas about how to make this work better with ELLs.

She'd have the words written on an index card and she'd hold them up and she'd say, "Okay. Everybody who can read this word, stand up." And pretty much all the kids would stand up. They're good word readers. Then she'd say, "Okay. If you know how to use it in a sentence, remain standing," and half the kids would sit down. "Now, if you can give me a definition, remain standing," and more of the kids would sit down. Basically, what she was doing was a little word awareness exercise. And I can tell you during the first week, all the kids were standing all the time. By 10 weeks into this, kids were really very acutely aware of whether they knew enough about these words to use them in sentences or to give definitions of them. So I think that was a really nice invention on her part.

She would talk about the paragraph. On Tuesday and Wednesday, she would use the activities that we provided or other slightly easier ones that she developed; she had the kids work alone or in pairs to do those. On Thursday, she had a debate. And I wish I had time to show you videos of these debates because the kids really got into it. They were so excited to be defending their point of view. And on Friday, they wrote their 'taking a stand' paragraphs.

Sarah Meacham, who did an ethnographic analysis of this classroom, counted instances of attempted and appropriate word use in the end-of-the-week essays and related it to what had gone on in class. For week eight, for example, the topic for the week was global warming, not 'is it happening?' but 'who is responsible for doing something about it?' You know, should I sell my SUV, should you stop drinking bottled water, should the government impose stricter regulations? The word use in those paragraphs was rated as appropriate, indeterminate, or wrong. "I attribute my friends to stop wasting electricity" is an example of inappropriate. Now, we have to applaud that sentence. The kid was trying to use the word -- but we can't say he knew what it meant.

This just shows for those five words for one week the total number of attempts by kids to use the word in their essays and, in purple, the number of correct uses. You see, it varied and it wasn't extremely high at all and these are those same data related to the number of times Jody used those words during the vocabulary instruction. What you see is that she used these words 20, 30, 40 times in order to get some percentage of the kids to use them in their essays. Recurrent exposure is really important--rich, elaborated and recurrent exposure to these words.

This is just the same data for another week, another set of words. And I think it should make us a little bit humble about traditional approaches to vocabulary instruction where you use the word in a sentence on Monday, you take a spelling test on it on Wednesday, and you forget it by Friday. Clearly, the number of times the word is mentioned over the course of the week had some relationship with the number of attempted uses in students' writing.

Did kids in this classroom learn these words? Well, comparing Jody's classroom to a comparison classroom, suggests that having the curriculum helped a lot. Jody implemented all 20 weeks, I should say. Her students learned five more words than students in a comparison classroom. For example, at the beginning of the year, 32 percent of the kids knew what "hypothesis" meant and, by the end, 88 percent did. 67 percent knew "sufficient" at the beginning; 96 percent did at the end.

Jeanette did a fairly elaborate scoring of all of the writings produced in this classroom with a rubric that looked at ideas, cohesion, and academic language use. It was eventually a reliable rubric. These are individual growth curves for each of the 25 kids in the class. The red line in the middle indicates the whole class. On a 9 point scale, 9 points was the maximum you could get on this rubric, kids moved up about .7 points over the course of the year. This was with no instruction in writing and with no feedback on the writing, just the weekly practice of thinking about it, taking a stand, and writing it out. So one of the things we want to do is beef up the writing instructional piece a little bit.

What are we doing this year? As I said, we've designed a 24-week curriculum. We've got an overarching theme with four strands. We're trying to really incorporate input from the content area teachers more authentically by giving each of them some topics to start. We're trying it out in six schools and comparing them to six other schools with similar demographics. And we're going to focus on

adaptations for English language learners. We've recruited Cathy O'Connor from Boston University, co-author of "Accountable Talk" with Sarah Michaels, to work with us on professional development to promote classroom discussion during the presentation of the words and the debate. And she's great at doing this. She's working with us to give teachers techniques like re-voicing what students say even if you're not sure you understand it, repeating what students say, asking other students to repeat what students have said, asking for agreement, and disagreement and reasons around the classroom, and using partner talk to get conversations started if the discussion isn't working very well. We'll be doing classroom observations, mostly to provide feedback to teachers and to prepare videos of excellent practice and to compare classrooms that are heavily populated by English language learners or just re-classified English language learners to those only with English-only kids.

I would like to thank lots of people who have worked on this project and, of course, CREATE for enabling us to take it into the ELL domain. Thank you.