Understanding **Language** | Language, Literacy, and Learning in the Content Areas

Commissioned Papers on Language and Literacy Issues in the Common Core State Standards and Next Generation Science Standards

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The Understanding Language Initiative engages educators, researchers and policymakers in a national dialogue addressing language, literacy, and learning within the Common Core State Standards and the Next Generation Science Standards.

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Conference Overview Paper

Goals of the Conference

To Deepen and Amplify Our Understanding of the Relationship between Language and Content

The Common Core State Standards now adopted by most states, and the Next Generation Science Standards currently under development, are intended to improve the culture of learning in classrooms across the country. As *Understanding Language* initiative leaders Kenji Hakuta and María Santos summarize it, they "raise the bar for learning, call for increased language capacities in combination with increased content sophistication, and call for a high level of discourse in classrooms across all subject areas."

The primary goals of the Understanding Language initiative are:

1. to examine and explain how and why language matters in the context of these new Standards;

2. to exemplify language-rich ways to support learning, with particular attention to the needs of English language learners (ELLs);

3. to expand and extend the work across the spectrum of the new Standards through working with school districts and in partnerships with support organizations during the implementation phase of these new Standards; and

4. to explore policy issues aimed at effectively educating ELLs in light of the new Standards and emerging approaches to second language acquisition and subject matter pedagogy.

The project commissioned the papers presented at this conference as a way to begin this work on all four fronts. Conference attendees included paper authors and others invited to comment and to represent the perspectives ranging from research to teaching and administration at the district, state, and partnership level. As multiple authors of conference papers emphasize, these standards provide both new challenges and new opportunities for English language learners. As Hakuta and Santos note, "ELLs have a right to appropriate education… grounded in sound theory [of content learning and language learning]… and implemented in ways that address their needs systematically, through coordinated support linking teachers, materials, formative assessments, tests and accountability systems, and technology." The conference explored the issues implicit in this statement.

Instruction based on sound theory of language learning was the topic of papers presented by van Lier and Walqui and by Walqui and Heritage, and the theme of the conference summary talk by Guadalupe Valdés. It also appeared as a common thread in papers on assessment and the three subject area papers on Standards and ELLs. The common message is that three parallel shifts in perspective on how language is learned are needed: From an individual process to a more socially engaged process;

from a linear building of structures and vocabulary aimed at correctness and fluency to a non-linear and complex developmental process aimed at comprehension and communication; and from teaching language *per se* to supporting participation in activity that simultaneously develops conceptual understanding and language use.

The conference explored the implications of these shifts for classroom support of language learners (papers 1-6, 9, 10, 11), for language proficiency standards and supports for ELLs in subject-area, standards-based assessments (papers 7, 8), and for policies related to the support of language learners (papers 10, 11, 12). The conference ended with three summary talks, from three perspectives: understanding language learning (Guadalupe Valdés); understanding language challenges and opportunities and the needs of disciplinary teachers implementing new standards (Phil Daro); and understanding language challenges and opportunities from a strategic perspective at the district, state and national levels (Jennifer O'Day).

Conceptualizations of Language and Language Acquisition

Complementary perspectives on the acquisition of language and literacy were presented throughout the conference, yet common themes emerged. Most salient among those included recommendations that we:

1. Move away from defining language primarily as form or even as function, and toward a redefinition of language as a complex adaptive system of communicative actions to realize key purposes.
2. Recognize that language learning occurs more effectively through indirect intervention where learners can acquire language experientially rather than through a structural syllabus of language forms. Language development occurs in subject area classrooms when teachers carefully scaffold language and content learning, and where students work and talk together. ELLs learn language as they engage in meaningful content-rich activities (projects, presentations, investigations) that encourage language growth through perception, interaction, planning, research, discussion, argument, and co-construction of academic products. Acceptance of "flawed" language supports growth in communication and participation in disciplinary learning.
3. Broaden the conception of literacy and learning and see them as not only being about the development of particular kinds of print-based skills but as "participation in a range of valued meaning-making practices" both in and out of school.

The conference summary by Guadalupe Valdés highlighted the changing views of language learning, both the process and the desired outcomes. She stated "where we are right now in the field is that we are beginning to talk about language as a complex adaptive system—indeed that is a term that comes out of chaos and complexity theory. The suggestion from this perspective is that language isn't linear, that it self-adapts in ways that are not predictable." She stressed that language instruction and language proficiency assessments have been based on a different view, of structures acquired in a particular order and of a steady progression toward a more "native speaker" standard of usage. She suggested "the native speaker norm [as a goal] is increasingly being questioned in the fields of applied linguistics and sociolinguistics." She noted the

common theme of the new Standards to require student participation in classroom activity and discourse that reflects the practices of the discipline, so that students can develop discourse skills within a community of practice. Thus, viewing language as a social practice, she asked, "what do most of our [ELL] students need to do to be able to [thrive in] these rich content classrooms?" answering that the first requirement is language comprehension sufficient to obtain information in this context. She then articulated a progression of what students at various levels of English language proficiency might demonstrate as evidence of having "obtained information." This example suggests an entirely different set of organizers for language proficiency standards, around practices emphasized by the new standards within the disciplines, instead of the usual "content-free" tasks found on most language tests assessing the ability to speak, listen, read, and write and emphasizing accuracy, complexity, and fluency. She challenged content assessment experts to develop ways to assess students' ability to participate in the classroom discourse and practices suggested by the new Standards, and their ability to learn content through that participation. She stressed also the value of students' self-assessing their language progress and language development needs. Finally, she turned to the issue of language instruction. She questioned the value of what is too often done in the name of teaching language, when its primary stress is on grammar and sentence structure, at the expense of pragmatic participatory competence. Furthermore, she noted that time devoted to explicit and direct language instruction tends to isolate ELLs from opportunities to learn subject content and to hear and learn language more naturally from examples of content- and age-appropriate language produced by other students and by teachers in content-rich and discourse-rich subject-area classrooms. She reiterated the comment of Hakuta and Santos that, in the context of these new Standards, we will need to "have these rich language environments and it will have implications for everything else that we do."

Challenges and Opportunities from New Standards

The common theme of the three papers devoted to particular disciplines, as well as those on instruction, was that the new Standards for language arts and mathematics and Next Generation Science Standards all require shifts in classroom practice. In particular these shifts increase the fraction of time students spend interacting and talking with one another around content. The challenge is then to ensure that ELLs become full participants in this discourse. This creates content-rich and language-rich learning opportunities, environments in which language is acquired through participation in meaningful activities. Students are provided with opportunities for developing their comprehension of the language used by teachers and peers in the classroom. Students use their emerging English to engage in the learning of science, mathematics, social studies and language arts.

We next summarize the critical shifts and opportunities discipline by discipline for the three areas for which common standards exist or are forthcoming in the near future: English language arts, mathematics, and science. Social studies is not separately discussed because new standards for this discipline have yet to emerge, but the ELA paper does address the Common Core State Standards for Literacy in History/Social

Studies, Science, and Technical Subjects. These standards specifically state that (a) the language and literacy development of ELLs is a shared responsibility among English teachers, English language development (ELD) teachers, and other content-area teachers and (b) the use of language and literacy varies with regard to different audiences and purposes within and across the disciplines.

Shifts in English Language Arts/Literacy:

The major shifts in the ELA/Literacy Standards are articulated in terms of what students must do in various domains:

1. Reading: Students read and comprehend literature and informational texts of increasing complexity to build knowledge.
2. Writing: Students use evidence to inform, argue and analyze for varied audiences/purposes and present knowledge gained through research.
3. Speaking and Listening: Students work collaboratively, understand multiple perspectives and present ideas.
4. Language: Students use language and conventions to achieve particular functions, purposes and rhetorical effects.

Leveraging Opportunities for ELLs in English Language Arts/Literacy:

The following teaching practices provide students with opportunities to work towards standards attainment in the domains of reading, writing, speaking and listening:

1. Reading: Instruction leverages background knowledge, builds strategic competence and provides supports to allow access to complex texts rather than simplifying or "pre-empting" the text.
2. Writing: Instruction draws upon students' home languages and background strengths to develop content for writing and scaffold writing itself; provides ELs with meaningful engagement with mentor texts, including opportunities to focus on language and text structure; and ensures that writing is meaningful communication.
3. Speaking and Listening: Instruction provides opportunities for extended discourse and engagement with academic texts; supports different kinds of participant structures (whole class, small group, one on one); develops meaningful collaborative tasks that allow students to use their full linguistic/cultural resources; and teaches ELs strategies to engage with text in multiple ways.

Shifts in Mathematics:

Two primary shifts characterize the new standards in mathematics:

1. A focus on practices: The eight mathematical practices described in the standards provide opportunities for students to engage in posing and solving problems, explaining concepts and making connections, understanding multiple representations of mathematical concepts and models, communicating their thought processes through procedures, justifying reasoning, and making arguments.

2. The importance of discussion: Instruction as envisioned in the standards should support mathematical discussions and use a variety of participation structures (teacher led, small group, pairs, student presentations, etc.) that allow students to use multiple representations (diagrams, charts, symbols, models, etc.) in communicating about mathematical content and engaging in mathematical practices.

Leveraging Opportunities for ELLs in Mathematics:

The following teaching practices provide students with opportunities to work towards developing language competence in the context of mathematics:

1. Focus on students' mathematical reasoning, not accuracy in using language.
2. Shift to a focus on mathematical discourse practices, moving away from simplified views of language such as those that focus only on vocabulary.
3. Recognize the complexity of language in mathematics classrooms and support students in engaging with this complexity: (a) multiple modes (oral, written, receptive, expressive, etc.), (b) multiple representations (including objects, pictures, words, symbols, tables, graphs, etc.), (c) different types of written texts (textbooks, word problems, student explanations, teacher explanations, etc.), (d) different types of talk (exploratory and expository), and (e) different audiences (presentations to the teacher, to peers, by the teacher, by peers, etc.).
4. Treat everyday language and experiences as resources, not as obstacles.

Shifts in Science:

Major shifts in the science standards consist of the following:

1. Inquiry is redefined as a set of eight science and engineering practices. These include four sense-making practices that are particularly language intensive[1] and parallel to similar demands in math and ELA.

2. Instruction focuses on a limited set of core concepts in order to build a coherent understanding of science over multiple years of school.

Leveraging Opportunities for ELLs in Science:

The following teaching practices provide students with opportunities to work towards developing language competence in the context of science:

1. Immerse students in science content through observation, investigation, and discourse.
2. Use models and visual representations of information as a resource and bridge for ELLs to grasp content.

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[1] Practice 2: Developing and using models; Practice 6: Constructing explanations (for science) and developing designs (for engineering); Practice 7: Engaging in argument from evidence; and Practice 8: Obtaining, evaluating and communicating information.

3. Call attention to the language challenges inherent in science texts and discourse as a way of supporting science learning and language development for all students.

Instruction and Teacher Professional Development

The shifts highlighted above place new demands on teacher capabilities. In this context, schools and districts implementing new curricula to match these standards are already beginning to see the need for professional development in the ways of teaching that embrace these shifts. Santos and Darling-Hammond noted that teacher attention to student language proficiency and home language in the context of a discourse-rich classroom needs to be integral to the skills they are learning at this transitional time. Heritage and Walqui stressed the need for teachers "to get good at contingent assessment" so that their instruction can respond both to the content learning and the language learning needs of their students.

The following goals for ELL instruction emerged from conversations by members of the Understanding Language Steering Committee shortly after the meeting. These goals are meant to guide district administrators, curriculum leaders, principals, coaches, ELL specialists and content-area teachers as they work together to ensure that instruction aligned with the standards is appropriate for the diverse needs of ELLs. Each of these is a target for professional development as well as for instruction:

1. Instruction includes supports and enhancements to meet the diverse needs of ELLs as they learn language and content simultaneously.
2. Instruction engages ELLs in meaningful activities designed to advance students' language development and ability to comprehend and produce academic discourse.
3. Instruction addresses the needs of students with various levels of English proficiency and with a variety of prior school experiences.
4. Instruction supports ELLs in building the skills they need to read, comprehend, write and discuss rigorous disciplinary texts and tasks independently.
5. Instruction leverages ELLs' prior knowledge, their native linguistic and cultural resources as well as their emerging English language skills.
6. Instruction incorporates effective diagnostic and formative assessment practices to determine whether any gaps in understanding are due to difficulty with concepts or with language and, in turn, guide instructional practice.

The concluding remarks by Phil Daro addressed the needs of teachers in the context of these new Standards. He began his remarks with the observation that schools and teachers are asking for very concrete help, both on how to implement the new Standards in their classroom, and on how to support ELLs in that context. He noted that the theme "it doesn't have to be perfect," invoked often during the conference to describe student language use in classroom discourse, can also be applied to teacher practice in developing the discourse-rich classroom environment. Daro went on to argue that "there is a new relationship between language and content that is quite explicit in the Standards" and that "knowledge, cognition, [and] language, these are all threads of a single fabric of learning."

One implication of this interconnection between language and content is that classrooms will need to evolve to devote much more time to student discourse. This change could have either dangerous or positive ramifications for English learners: if an increased focus on language is done carelessly or lazily, ELLs will be left out yet again, unsupported in engaging with rigorous content; however, if the additional discourse time is implemented with attention to participation and inclusion, it will be an excellent opportunity for ELLs to grapple with content regardless of their language skills. Daro stresses that both content learning and language learning require the classroom to "slow down for learning, thinking, and language." He notes that, in classrooms in Singapore, when "a child starts a sentence, everyone waits until it is finished. And if the thought is incomplete, there is a follow-up question [to urge that student or others] to complete the thought." He notes that slowing down will require a trade-off: teachers will be able to 'cover' fewer topics, but will be offering students the chance to make deeper sense of the content they do work with. Learning is best served with a more minute-to-minute feedback and decision cycle about what each student needs next, requiring teachers to listen and respond to student thinking, and to support students in "learning how to assess their own sense-making."

English Language Learners in Bilingual Programs

While the majority of talks in the conference focused on ELLs in classrooms where English is the dominant language of instruction, discussion around the paper on bilingual classrooms from Brisk and Proctor revealed that there was substantial agreement that bilingual education is an important path to language and subject-area competence, and can succeed provided that the teachers are themselves highly proficient in both the language of classroom instruction and the subject-area content they teach. The paper points out further advantages of the bilingual approach, with which there was little argument. This option appears to be limited both by policy in some states and by the availability of qualified teachers.

Policy Challenges and Opportunities

The heightened expectations around language in the new Standards pose major challenges for all students who engage with rich academic content, especially English language learners (ELLs). Authors Delia Pompa and Kenji Hakuta offer a set of recommendations for policy makers to consider as states and school systems are implementing the new Standards. Authors Jamal Abedi, Robert Linquanti, Alison Bailey and Mikyung Kim Wolf discuss issues related to English language proficiency standards and the role of the language assessments in the context of the new Standards.

1. Ensure **alignment of all key components of the state system with the new Standards**. Curriculum, instructional materials, teacher preparation and professional development systems, and assessments used to measure student performance must be aligned with the Standards to ensure that students are not only taught to higher expectations, but also appropriately assessed for their learning.
2. **Develop and implement valid and reliable assessments** for all students that reflect the expanded language demands inherent in the new Standards. Policymakers need to move toward an assessment and accountability system that

weighs and includes performance on English language proficiency and academic assessments. Assessment systems based on the new Standards (including the systems being developed by the Partnership for Assessment of Readiness for College and Careers, the Smarter Balanced Assessment Consortium, as well as the state English language proficiency assessments) must validly measure the language demands that accompany the new Standards.

3. Ensure **professional development** that allows for greater **collaboration** among practitioners to support these common practices both at the student and teacher levels. Some core areas of professional development for all teachers (pre-service, in-service, and bilingual) include:
   A. Examine the Common Core State Standards and Next Generation Science Standards for the kinds of tasks students will be expected to undertake;
   B. Develop a foundational understanding of content pedagogy that incorporates an understanding of the language of the discipline(s);
   C. Develop foundational understanding of language development and strategies for ELLs, with applications *within* the discipline(s);
   D. Support approaches that build bridges between students' native language knowledge and cultural assets and their evolving acquisition of English in an academic context.
4. Implement effective **parent and community engagement strategies.**

Discussion of English language proficiency (ELP) standards raised the issue of what it means to align or coordinate these standards with the new subject area standards. A variety of opinions were expressed. While the new Standards express the need to attend to ELLs in terms of both language learning and content learning, there are varied views on how best to achieve this, and what role ELP standards play to ensure it. Conference participants generally agreed that English language proficiency standards should be viewed as articulated progressions to help educators understand and attend to ELL students' language development needs, and not as separate, watered-down content standards. Some presenters referred to a "threshold level" of language proficiency, below which explicit language instruction would be necessary to ensure ELLs develop the foundational language skills to meaningfully participate in language-rich content classrooms. Yet there was no agreement on where or how that threshold might be set, and other participants expressed concern about assuming content area teachers by themselves can develop ELL students' language capacities solely through content instruction. Others noted that suggestions to curtail ELP standards and assessments to a "threshold level" might require changes in current federal and state statute, and wondered if such a move could be viewed as undercutting ELLs' protected-class status under current civil rights law. Further complicating the issue is that current language assessments are built from a view of language learning as learning structure and form, rather than as learning to interpret, interact and present in the content areas, uses identified as critical during most of the conference discussions. As we reported above, in her concluding remarks Guadalupe Valdés challenged assessment experts to envision a new approach to defining and measuring language proficiency aligned with this perspective on language development.

The paper by Bailey and Wolf points out some of the challenges of identifying and defining the language knowledge and skills that students need in order to achieve proficiency on the new Standards and the variety of ways these might be interpreted. They also noted the need for schools to be able to link student scores on ELP and content-area assessments to investigate correlated problems and respond to them across English-language instruction and content-area teaching. In their paper, Abedi and Linquanti suggest that a framework for ELP standards development is needed that carefully delineates the breadth, depth and complexity of target language uses reflected in new Standards. They also advocate for the collaboration of content, language and assessment experts on key measurement challenges for ELL students as assessments of the new Standards are designed. For example, they call for particular attention to limiting "construct-irrelevant" language burden in both content *and* language assessment items and tasks.

Both assessment papers argued for greater use of formative assessment practices and tools within the larger assessment *and instructional* systems, in order to provide more timely feedback and guidance to both teachers and students.

Cross-cutting Themes:
Jennifer O'Day reflected on the conference by selecting three words that emerged over and again throughout the discussions of the papers. The first of these was ***practice***. Conference participants discussed practice in many contexts: the disciplinary practices expected of students as highlighted in the Standards; instructional practices that teachers will need in order to support and include all students, and the requisite professional development for such practices; practice as a way of developing skills and as building upon prior knowledge, both for teachers, and for students; and the tacit understanding that language and disciplinary learning can only develop through such practice. A second theme was ***language*** and the opportunities for language learning that exist in content-area classrooms. O'Day pointed out that language is both the path to content and part of the content itself. Making the language demands and practices of the content-area classroom explicit for teachers and students can help teachers support language learning in the service of content-area learning. Teachers need to be able to "help students notice [language] and unpack it as needed for the students to enter into the content, develop their understanding, achieve their goals and carry out the actions that they want to carry out with that content. This is important for all kids, but it is especially important for language learners." Finally, O'Day noted that almost every paper and speaker discussed ***opportunity***: opportunities for language learners in changes to classroom practices, opportunities for improving policies and assessments for ELLs, and the particular opportunity provided at this moment by the adoption of new and broadly shared Standards in many states. She ended with a challenge to all participants to find specific and strategic entry points to support needed changes and to turn these opportunities into the reality of "implementation [of the new Standards] that includes ELLs as full participants and full beneficiaries."

Realizing Opportunities for English Learners in the Common Core English Language Arts and Disciplinary Literacy Standards

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> *Students who meet the Standards readily undertake the close, attentive reading that is at the heart of understanding and enjoying complex works of literature. They habitually perform the critical reading necessary to pick carefully through the staggering amount of information available today in print and digitally. They actively seek the wide, deep, and thoughtful engagement with high-quality literary and informational texts that builds knowledge, enlarges experience, and broadens worldviews. They reflexively demonstrate the cogent reasoning and use of evidence that is essential to both private deliberation and responsible citizenship in a democratic republic. In short, [they] develop the skills in reading, writing, speaking, and listening that are the foundation for any creative and purposeful expression in language.* (Standards, p. 3).

This brief paper is intended to contribute to a larger—and longer—conversation about what those collectively responsible for the education of English Learners (ELs) must consider in order to maximize the affordances presented by the Common Core State Standards for English Language Arts and Literacy in History/Social Studies, Science, and Technical Subjects (hereafter referred to as the "the Standards").[1] In order to address how opportunities presented by the Standards can be *realized* for ELs—both *understood* and *actualized*—we focus on four particular areas emphasized by the Standards as necessary for career and college readiness and for becoming "a literate person in the twenty-first century": engaging with complex texts; using evidence in writing and research; speaking and listening in order to work collaboratively and present ideas; and developing the language to do all of the above effectively. Each of these areas represents a shift from how language and literacy instruction has often been approached, both in mainstream English language arts (ELA) and in separate courses for ELs, such as English language development (ELD).[2]

The selected areas also highlight the fact that literacy instruction is a shared responsibility among teachers in *all* disciplines. In grades K–5, the standards articulate expectations for students in the areas of reading, writing, speaking and listening that apply to all subjects; in grades 6-12, the standards are divided into two sections—those specifically for ELA and those for history/social studies, science, and technical subjects. This interdisciplinary approach reflects the crucial role ELA teachers play in developing students' literacy skills while at the same time acknowledging the impact other subject matter teachers have in students' literacy development. The Standards acknowledge that college and career readiness requires reading with "an appreciation of the norms and conventions of each discipline" and writing with consideration of different kinds of tasks, purposes, and audiences.[3] This focus on disciplinary literacy presents new challenges for both content-area teachers and English and ESL instructors.

For each of the domains included in the Standards (reading, writing, listening and speaking, and language), we first outline what the Standards call upon students to do, emphasizing the simultaneous challenges and opportunities for ELs. We then offer insights, derived from both research and theory, for addressing the challenges and realizing the opportunities. Before turning to each of the areas, however, it is important to emphasize the following overarching considerations:

- Any discussion about potential affordances for ELs must consider variation among ELs, including age, grade level, native languages, language proficiency levels, literacy background both in English and other languages, and quality of previous schooling.[4]

- Instruction for ELs must include both "macro-scaffolding," in which teachers attend to the integration of language and content within and across lessons and units, as well as "micro-scaffolding" during the "moment-to-moment work of teaching."[5]

- Because language and literacy practices vary from discipline to discipline, realizing opportunities for ELs must involve collaborative efforts across a number of different instructional settings, including ELA, ELD, and other content-area classrooms.[6]

- Practices called for by the Standards, such as *argument* and *critique*, are grounded in particular socially and culturally specific values and practices that may or may not align with those of students from different backgrounds; students from non-dominant linguistic and cultural groups may position themselves in various ways vis-a-vis mainstream expectations.[7]

- Socialization into new academic discourse communities involves not only the acquisition of new language and literacy skills, but also potential "internal and interpersonal struggles" and "emotional investment and power dynamics."[8]

Our comments in this paper can best be understood in the context of insights about language, literacy, and learning outlined in several other papers prepared for this project[9]:

- All learning builds on students' prior knowledge and experiences; instruction for ELs must consider *and expand* what ELs bring to the classroom.

- Instruction should provide apprenticeship for ELs in communities of practice with teachers and peers in order to develop students' independence.

- Language development and cognitive development are interrelated and mutually dependent; ELs learn language as they learn content.

- Language can best be understood as action, rather than "form" or "function" alone; students learn to do things with language when they are engaged in meaningful activities that engage and challenge them.

- Literacy involves social practices as well as cognitive processes; reading and writing, as well as other forms of meaning-making, always represent *activity* (whether intended or not by teachers) in which participants have different purposes and take on different roles and identities.

- In order to develop the ability to read complex texts and engage in academic conversations, ELs need access to such texts and conversations, along with support in engaging with them.

- Learning languages involves expanding *linguistic repertoires* in order to engage in a wide variety of situations, with a wide variety of audiences, for a wide variety of purposes.

- With support, ELs can build such repertoires and engage productively in the kinds of language and literacy practices called for by the Standards for both ELA and other disciplines, even though their developing language will be marked by "non-native" or imperfect features of English.

1. Reading: Engaging with Complex Texts to Build Knowledge Across the Curriculum

The Standards require students to read and comprehend both literary and informational texts that represent steadily increasing complexity as they progress through school. Text complexity, according to the Standards, involves not only the grammatical features of a text and its vocabulary demands, but also elements such as the multiple levels of meaning embedded in a text, the explicitness with which the author's purpose is stated, the typicality of genre conventions, and the extent to which the text employs figurative language.[10] The Standards require that 50% of the complex texts read by students at the elementary level be informational in character—shifting to 75% in high school—reflecting the role of texts in building students' knowledge across K-12 disciplines and after high school.

Accessing and comprehending texts featuring complexity of the kinds outlined above present challenges for all students as they grapple with new and cognitively complex ideas and concepts, particularly for those who have had limited access to such texts either at home or at school. Those reading in a second language face additional challenges, as they are called upon to process "intricate, complicated, and, often, obscure linguistic and cultural features accurately while trying to comprehend content and while remaining distant from it in order to assess the content's value and accuracy."[11] To meet this challenge, second language readers draw on a variety of potential resources, including knowledge of the (second) language they are reading in, literacy skills in their first language, reading comprehension strategies, background knowledge related to the target reading, and interest and motivation.[12]

Beginning-level ELs in the younger grades learning to read for the first time face particular challenges, as they are attempting to learn to decode written text in a language they are at the very early stages of acquiring. The use and development of oral language is particularly important at this stage, as it serves as one foundation that students use to build early reading skills. The standards themselves emphasize the importance in the early grades of students' participating in discussions, asking questions, sharing their findings, and building on others' ideas. It is important to note that research has shown that ELs can develop literacy in English even as their oral proficiency in English develops. Meanwhile, ELs' early literacy experiences, including those in students' first languages, support subsequent literacy development, and "time spent on literacy activity in the native language—whether it takes place at home or at school—is not time lost with respect to English reading acquisition."[13]

Throughout the grades, learning about ELs' language and literacy backgrounds, interests, and motivations provides teachers with clues as to what supports might help students to compensate for the linguistic and textual challenges presented by different kinds of texts.

Understanding students' knowledge and interests does not mean that only texts that already fit within ELs' "comfort zones" should be assigned—indeed, one of the opportunities afforded by the Standards is the promise of access to a wide variety of texts that can expand those comfort zones. Leveraging students' existing background knowledge, and building new knowledge, can be accomplished in a number of ways before and during a lesson or unit of study—without preempting the text, translating its contents for students, telling students what they are going to learn in advance of reading a particular text, or "simplifying" the text itself.[14] Possibilities include pre-reading activities and conversations that access and build on students' background knowledge and set up excitement and purpose for reading in a unit; text annotations that gloss crucial vocabulary or provide necessary contextual information without paraphrasing the text for students; and activities during and after reading that allow students to engage in knowledge-building with their classmates and teachers.[15] Crucial to all of the above is teachers' understanding that texts are approached differently for different purposes, and that students need opportunities to approach texts with these varied purposes in mind.[16]

A consideration of students' second language proficiency, literacy backgrounds, and background knowledge can also inform instructional efforts to enhance the strategic moves students can apply to engage successfully in independent reading across the curriculum—especially when called upon to read texts beyond their English language proficiency levels. Such instruction can do the following:[17]

- Induce readers to consider (or even research) the topic at hand using more accessible texts (including those in a students' L1 for ELs who read in their first languages) in preparation for reading more difficult texts as part of the same lesson or unit.

- Assist readers in deciding which words in a given text are critical for particular uses of the text and which can be skipped.

- Focus readers' attention on meaning-critical grammatical structures (and how those might compare with how grammar is used to make similar meaning in students' first languages).

- Build on and expand readers' knowledge about how different kinds of texts are structured.

- Focus readers' attention on specific features of text complexity by choosing authentic and original texts that emphasize one or two features at a time (such as a linguistically more accessible text that features multiple meanings, a lexically dense piece with a simpler grammatical structure, or a text in the students' native language that includes the challenging text structures of an unfamiliar genre).

- Integrate a focus on vocabulary-building with meaningful activities centered around texts.[18]

When envisioning how to support ELs' reading of the kinds of complex texts called for by the Standards, and how to recognize students' developing ability to do so, it is also important to consider how "comprehension" is defined and measured. As is the case with struggling readers in the general student population, ELs' developing ability to "make decisions about a text and to subsequently evaluate and revise those decisions"—arguably the kind of reading valued by the Standards—may be masked, and even stifled, by instruction that only values "correct" interpretations of what a text "really" means on one hand, or the use of a pre-ordained set of "reading comprehension" strategies on the other. In other words, especially for ELs who may be called upon to read texts with increasingly unfamiliar content matter expressed in language that

is beyond their English proficiency levels, what is important to foster and recognize is ELs' use of texts and textual evidence for sense-making, even if their inferences and processes do not initially match those of the more experienced readers or native speakers of English. This is not to say that a focus on "correct answers" is never justified. Especially in content area classrooms, such clarification may be crucial. But in terms of fostering—and recognizing—students' ability to make sense of complex text, both literary and informational, ELs may be well served by opportunities to explore—and justify—their own "textual hypotheses," even if their initial interpretations diverge from those of the teacher.[19]

2. Writing: Using Evidence to Inform, Argue, and Analyze

The Standards call upon students, by the time they graduate, to be adept at sharing information accurately to help readers better grasp a topic or concept, presenting arguments logically to defend interpretations or judgments, and crafting written language skillfully to achieve their purposes. The Standards draw on studies showing that a nexus of skills—using evidence, analyzing information in writing, and conducting research—is essential for success in the argument-based culture of universities as well as today's diverse, information-rich professional environments.[20] As students progress through the grades, the Standards ask them to demonstrate their growing ability to cite specific evidence in defense of the claims they make as well as consider the strength of the evidence others provide when making arguments.[21] The standards also incorporate and integrate a focus on research skills in order to prepare students to ask questions and solve problems independently. The goal is to ready students for college and careers so that they are able to conduct investigations, analyze information, and create products that reflect the increasing emphasis research receives in an information-based economy. In relation to research-based writing specifically, ELs not only face the common obstacles all students experience in attempting to gather, manage, and organize the flow of information; they also must analyze and evaluate what they read while negotiating a second language. This research process requires students to read complex texts and use evidence in writing (and/or orally) while navigating conventions of textual ownership and citations, an area that offers challenges for all students in an electronic age but that can be particularly challenging for EL students who have learned these culturally defined practices outside of U.S. academic settings.[22]

Just as teachers can carefully scaffold the reading of complex texts, they can also assist ELs to develop the ability to write for the wide variety of audiences and purposes emphasized by the Standards. Like first language writing, second language writing develops gradually over time, with considerable variation in individual learners' progress through different stages of development.[23] However, second language writing development is also distinct. Although second language writers are still acquiring oral language proficiency in English, they already possess age-appropriate oral language proficiency in their home language(s). Depending on their age and background, some may also have home-language literacy skills from which they can draw.[24] EL writers, however, are a diverse group. Some young children are exposed to writing for the first time in English-medium ELD or ELA classes. Others learn to write in more than one language in bilingual classrooms, at home, or in the community. At the secondary level, some ELs bring first-language literacy skills to the task of writing in English, but many write only in English, not having acquired home language literacy in the school or home. For individuals with prior literacy background, writing skills can transfer across languages, although questions remain regarding how these processes occur.[25] ELs' opportunities for classroom writing also vary according to teacher expectations, course placement, and content area, and for students with limited exposure to English outside of school, writing development may occur very slowly.[26]

Just as print exposure improves students' long-term writing development in their first language, the features of texts read by ELs influence the writing they subsequently produce.[27]

Several instructional strategies hold promise for ELs in meeting the Writing Standards. Overall, such strategies focus on developing what is called for by the Standards (e.g. writing different text types for different audiences and purposes and presenting knowledge gained through research) rather than ELs' production of mechanically and grammatically "flawless" writing.[28] Accordingly, writing instruction can do the following:

- Maximize the use of ELs' existing linguistic and cultural resources by ensuring that students have meaningful ideas to write about, allowing them to use their home languages or varieties of language during the writing process, employing technology that students already use, and drawing upon their background knowledge, practices, and experiences.[29]

- Provide ELs with meaningful exposure to the types of texts they will be writing, guiding students through the linguistic and rhetorical patterns found in different genres.[30]

- Ensure that writing instruction creates meaningful opportunities to communicate rather than mechanical exercises for text production.[31] These opportunities include interactions with peers and teachers about ELs' writing and sensitive yet substantive feedback about the content of their writing at multiple points throughout the writing process.

In relation to research skills specifically, instruction can:

- Encourage students with L1 literacy backgrounds to draw upon this resource to help them locate, evaluate, and analyze information.

- Assist students in selecting reading and drafting strategies appropriate for varied research tasks.

- Provide explicit guidance on the conventions of textual ownership and citations in U.S. academic settings, alongside clear yet critical explanations of the purposes these conventions serve.

- Create opportunities that allow ELs to learn research processes by participating in teacher-guided and collaborative endeavors before attempting research independently.

Teachers can use such approaches to aid students in learning how to conduct investigations, analyze information, and create final products that meet the expectations of the Standards while strengthening and deepening the understanding students have of L2.

3. Speaking and Listening: Working Collaboratively, Understanding Multiple Perspectives, and Presenting Ideas

The Speaking and Listening Standards call upon students to listen critically and participate actively in cooperative tasks. They require students to build upon others' ideas, articulate their own ideas, and confirm their understandings through informal, collaborative group interactions as well as formal presentations that integrate information from oral, visual, quantitative, and media sources for different audiences, tasks, purposes, and disciplines. The Standards also expect students to interpret information; explain how it contributes to target topics, texts, and

issues; and "present claims and findings by sequencing ideas logically and using pertinent descriptions, facts, and details to accentuate main ideas or themes."[32]

As with reading, the comprehension of oral language requires a number of interrelated knowledge sources.[33] Effective listening comprehension also requires the use of strategies, such as focusing on relevant parts of a message, making predictions, and monitoring one's own comprehension.[34] At the same time, speaking and listening in the classroom involve more than individuals acting alone. Students use *interactional competence* to participate in the social context of the classroom, negotiating, constructing, and sometimes resisting norms of interaction governing various typical classroom participation structures.[35] Classrooms feature a number of different speech events, each of which is "directly governed by the rules or norms of the use of speech."[36] Even within a single speech event, norms can be quite complex.[37]

For ELs to realize opportunities presented by the Listening and Speaking Standards, teachers across the curriculum can support students by offering a wide variety of classroom discourse structures. Many of the interactive structures conducive to building knowledge and discussing ideas also hold promise for language development.[38] Teachers can do the following:

- Engage students in individual, small group, and whole-class discussions that move beyond traditional initiation-response-evaluation structures to "bridging discourses" that encourage ELs to produce extended oral discourse and engage with academic registers.[39]

- Develop collaborative tasks that require effective and linguistically rich discussions.[40]

- Allow ELs to collaborate in their home languages as they work on tasks to be completed in English.[41]

- Teach ELs strategies for using their still-developing English language proficiency to engage in different communicative modes.[42] For example, listening comprehension activities can help ELs to "arrive successfully at a reasonable interpretation of extended discourse," rather than to process every word literally, which is impossible even for native English speakers to do.[43]

4. Language: Using and Developing Linguistic Resources to Do All of the Above.

The Standards maintain that in order to be college and career ready, students need a "firm control over the conventions of standard English," but also that "they must come to appreciate that language is at least as much a matter of craft as of rules."[44] According to the Standards, students must be able to "choose words, syntax, and punctuation to express themselves to achieve particular functions and rhetorical effects." It is important to understand that ELs, by definition, will use "imperfect" (i.e. non-native-like) English as they engage in these functions and achieve these effects. By focusing on language as it relates to communicative and academic endeavors, rather than merely as the acquisition of "good" English, teachers can help students develop and use grammatical structures, vocabulary, and written and oral conventions as resources for making meaning, for learning, and for communicating with an increasing number of audiences for an increasing number of purposes.

In the context of the expectations for all students articulated by the Standards, "language instruction" for ELs can no longer be envisioned as isolated from the context of meaningful and

engaging academic work. Although the decontextualized teaching of discrete elements of a second language (e.g. verb tenses, grammatical structures, vocabulary) may be effective for inducing the use of those elements on restricted tasks and tests that highlight them, it is unclear whether such instruction is effective for fostering the use of those elements in wider communication.[45] This is not to say that an explicit focus on language is not called for, but rather that such a focus must occur in conjunction with, and in the service of, meaningful academic work across the curriculum.[46]

In supporting the development of ELs' language, it is also important to keep in mind that all school-age children (barring either extreme impairment or severe early childhood abuse and isolation) already have the linguistic resources in at least one language to engage in a wide range of communicative settings.[47] All students, therefore, have first-hand knowledge of the conventions and the rhetorical craft of language as used in their own communities of practice.[48] In fact, children who are in the process of developing more than one language may have a heightened awareness of such functions and effects because they use two or more languages.

At the same time, students' linguistic backgrounds will be more or less closely aligned with the varieties of language privileged in school, and it is undoubtedly in the interest of ELs to expand their linguistic repertoires to include those varieties. In supporting students to do so, a couple of final points are important to keep in mind:

- ELs' incomplete acquisition of standard varieties of English should not be interpreted as students' inability or unwillingness to participate in a wide range of learning, language, and literacy practices across the disciplines, including those called for by the Standards.

- With appropriate supports, ELs' participation in the key practices called for by the Standards—especially those highlighted in this paper— can promote the development of both language and literacy.

Conclusion

We conclude by pointing out that "shared responsibility" for preparing ELs for the language and literacy called for by the Standards rests not only with teachers across the disciplines, but also with curriculum developers, textbook writers, assessment specialists, teacher educators, administrators, researchers, policymakers, and others. Our hope is that the brief comments in this paper can serve as a starting point for envisioning what role each of us—individually and collectively—might play in realizing the opportunities potentially afforded to English Learners by the Standards.

Acknowledgments

Notes

[1] Our intention is not to render a judgment regarding the content of the standards, the assumptions about literacy upon which they are based, or the appropriateness of the standards for ELs. Nor is it to provide a systematic review of the empirical literature available on the language and literacy development of ELs (for such reviews, see American Educational Research Association, 2004; Genesee, Lindholm-Leary, Saunders, & Christian, 2006; Goldenberg & Coleman, 2010; Saunders & Goldenberg, 2010).

[2] Other terms to refer to these classrooms include English for Speakers of Other Languages (ESOL) and English as a Second Language (ESL).

[3] Standards, p. 60 and p. 63.

[4] Helpful discussions of the range of characteristics necessary to consider can be found in Walqui (2005), Olsen (2010), Valdés, Bunch, Snow, & Lee (2005), and Enright (2011).

[5] Schleppegrell & O'Hallaron (2011, p. 7); see also Walqui (2006) and Walqui & van Lier (2010).

[6] Lee & Spratley (2010); Olsen (2010); Schleppegrell (2004); Shanahan & Shanahan (2008); Valdés et al. (2005); Wineburg, Martin, & Monte-Sano (2011).

[7] Canagarajah (2004), Pennycook (2000).

[8] Duff (2010, p. 170).

[9] See especially VanLier & Walqui (2012); Hull (2012); Wong Fillmore & Fillmore (2012); Walqui & Heritage (2012)

[10] See Appendix A of the ELA and disciplinary literacy standards for further information about how text complexity can be defined and determined.

[11] Bernhardt (2011, p. 19).

[12] While research on second language readers has only begun to study the ways in which these various factors interrelate, it is likely that second language readers use the resources they have in some areas to compensate for those they are lacking in others (Bernhardt, 2011).

[13] Riches & Genesee (2006); see also Goldenberg & Coleman (2010).

[14] Available research on second language reading indicates that text simplification is ineffective for promoting comprehension and may even be counterproductive (see Bernhardt, 2011, pp. 59-60).

[15] See Walqui & vanLier (2010) for helpful suggestions for creating such activities.

[16] Also important to understand is that readers play multiple roles when approaching any text. Gibbons (2002) draws on Luke and Freebody (1990) to point out that readers are simultaneously *code breakers*, *text participants*, *text users*, and *text analysts*; see also Schleppegrell & Colombi (2002).

[17] Many of these strategies are elaborated upon in Bernhardt (2011).

[18] For examples, see Kelley, Lesaux, Kieffer, & Faller (2010) and Scott, Skobel, & Wells (2008).

[19] This paragraph draws heavily from Aukerman (2008), and the quotations are from that source.

[20] See Graff (2003); Postman (1997); Williams & McEnerney (n.d.).

[21] Using evidence is particularly emphasized in Reading Standard 1 and Writing Standard 9.

[22] See Pecorari (2003) and Flowerdew (2007) for recent perspectives on textual borrowing and second language writers.

[23] R. Ellis's (1994) contention that acquisition of an L2 grammar occurs in stages is echoed in findings for first language writing (Loban, 1976; Henderson, 1981; Graves, 1983). See Fu (2009) and Valdés (2001) for differing descriptions of stages observed in L2 writing development.

[24] See Harklau (2002).

[25] See Grabe and Kaplan (1996) and Grabe (2003).

[26] See Fu (1995), Harklau (1999), Hartman & Tarone (1999), Valdés (2001), and Valdés & Sanders (2006).

[27] For the effects of exposure to print in the L1, see Wagner and Stanovich (1996); for the impact of texts read on L2 writing, see Samway and Taylor (1993).

[28] See Truscott's (1996) review claiming no evidence supporting grammar correction in writing instruction and Ferris' (1999) rebuttal and subsequent publications (2002, 2003).

[29] See the recent collection edited by Manchón (2011) regarding the use of writing in the learning process. For uses of the first language while writing, see Fu (2009), Kibler (2010), National Council of Teachers of English (2012), and Souryasack & Lee (2007). Black (2005) and Smythe & Neufeld (2010) suggest the use of various technologies to

facilitate writing. See Langer (1997), McGinnis (2007), and Trueba, Moll, Diaz, & Diaz (1984) regarding use of students' background knowledge, practices, and experiences.

[30] Such instruction can focus explicitly on the role of grammatical and lexical features in making meaning for different audiences and purposes (e.g. Achugar, Schleppegrell, & Oteíza, 2007; Aguirre-Muñoz, Park, Amabisca, & Boscardin, 2008; Gebhard, Harman, and Seger, 2007; Gebhard & Willett, 2008; Schleppegrell, 2004).

[31] For an example, see Bunch, Lotan, Valdés, & Cohen (2005); see also Valdés (2001) and Valdés & Sanders (2006).

[32] Standards, p. 49.

[33] Sources of information required for listening comprehension include schematic knowledge (factual, sociocultural, and discourse-related background information), contextual knowledge (physical settings, participants, and what has been/will be said), and systemic knowledge (semantics, syntax, and phonology) (Anderson & Lynch, 1988).

[34] See Anderson & Lynch (1988) and Goh (2005). It is also important to understand that because comprehension rests on such a broad base of knowledge and strategies relevant to a given situation, the fact that ELs and their interlocutors encounter difficulties in spoken interaction is not surprising: second language listening research has documented a range of lexical, grammatical, and conceptual causes of misunderstandings for non-native speakers in spoken interactions (Rost, 2002).

[35] Cazden (1986, 2001); Mehan (1979); Philips (1972, 1983).

[36] Hymes (1972, p. 56).

[37] In classroom presentations, for example, students are often asked to manage the floor, either as individuals or as a group, while also being ready to respond to the teachers' unpredictable interjections and directives at moment's notice, as well as often engage with the student audience's questions and comments after the delivery of information (Bunch, 2009). Meanwhile, during the entire presentation, students are called upon to address different audiences simultaneously. In almost every presentation, students are asked to address their fellow classmates while knowing that the teacher is the audience who will ultimately be evaluating them. Some presentations additionally call for students to imagine that their audience knows nothing about the topic they are presenting on (even if this is not the case), or to engage in a roleplay in a contemporary or historical context. Engaging in whole-class discussions or group work involve different, but similarly complicated, rules of interaction and audience engagement.

[38] See Gutiérrez (1995); Hawkins (2004); McGroarty (1993); McGroarty & Calderón (2005).

[39] See Mehan (1979) and Sinclair & Coulthard (1975) for an overview of the three-part classroom discourse structure; the term "bridging discourses" comes from Gibbons (2006); see also Wells (1999) and Valdés (2004).

[40] See Bunch (2006, 2009); Bunch, Abram, Lotan, & Valdés, (2001); Bunch et al. (2005).

[41] See Anton & DeCamilla (1998); Brooks & Donato (1994); DeGuerrero & Villamil (2000); Kibler (2010); Swain & Lapkin (2000).

[42] These include the *interpersonal mode*, which requires moment-by-moment, unplanned interaction but affords the opportunity for immediate clarification of meaning; the *presentational modes*, which allows for planning but requires anticipating audiences' needs; and *interpretive mode*, which does not require production but does not generally allow for clarification of understanding (National Standards in Foreign Language Education Project, 1996).

[43] See Brown & Yule (1983, p. 57). A number of helpful instructional activities for focusing on listening comprehension in the context of K-12 academic content instruction are available in Gibbons (2002) and Zwiers (2008).

[44] Standards, p. 51.

[45] See Valdés, Capitelli, & Alvarez (2011) for a review of the literature on this topic.

[46] For examples of integrating a focus on discrete language features with meaningful academic work, see Gebhard, Harman, & Seger (2007); Schleppegrell (2004), Kelley, Lesaux, Kieffer, & Faller (2010); and Scott, Skobel, & Wells (2008).

[47] All students, regardless of their language or cultural background, speak one or more variety of a home language, and that variety is associated with students' geographical background, racial and ethnic community, and identity affiliations; there are no speakers of any language without an "accent," and, from a linguistic standpoint, there are no varieties of English (or any other language) that are superior to any other variety (see MacSwan, 2000; MacSwan, Rolstad, & Glass, 2002; Valdés et al., 2005).

[48] See Gutiérrez, Morales, & Martinez (2009); Gutiérrez & Orellana (2006); Orellana & Gutiérrez (2006).

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Mathematics, the Common Core, and Language: Recommendations for Mathematics Instruction for ELs Aligned with the Common Core

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1. Introduction

This paper outlines recommendations for meeting the challenges in developing mathematics instruction for English Learners (ELs) that is aligned with the Common Core Standards. The recommendations are motivated by a commitment to improving mathematics learning *through language* for all students and especially for students who are learning English. These recommendations are not intended as recipes or quick fixes, but rather as principles to help to guide teachers, curriculum developers, and teacher educators in developing their own approaches to supporting mathematical reasoning and sense making for students who are learning English.

These recommendations for teaching practices are based on research that often runs counter to commonsense notions of language. The first issue is the term *language*. There are multiple uses of the term *language*: to refer to the language used in classrooms, in the home and community, by mathematicians, in textbooks, and in test items. It is crucial to clarify how we use the term, what set of phenomena we are referring to, and which aspects of these phenomena we are focusing on. Many commentaries on the role of academic language in mathematics teaching practice reduce the meaning of the term to single words and the proper use of grammar (for example, see Cavanagh, 2005). In contrast, work on the language of specific disciplines provides a more complex view of mathematical language (e.g., Pimm, 1987) as not only specialized vocabulary (new words and new meanings for familiar words) but also as extended discourse that includes syntax and organization (Crowhurst, 1994), the mathematics register (Halliday, 1978), and discourse practices (Moschkovich, 2007c). Theoretical positions in the research literature in mathematics education range from asserting that mathematics is a universal language, to claiming that mathematics is itself a language, to describing how mathematical language is a problem. Rather than joining in these arguments, I use a sociolinguistic framework to frame this essay. From this theoretical perspective, language is a socio-cultural-historical activity, not a thing that can either be mathematical or not, universal or not. I use the phrase "the language of mathematics" not to mean a list of vocabulary or technical words with precise meanings but the communicative competence necessary and sufficient for competent participation in mathematical discourse practices[i].

It is difficult to make generalizations about the instructional needs of all students who are learning English. Specific information about students' previous instructional experiences in mathematics is crucial for understanding how bilingual learners communicate in mathematics

classrooms. Classroom instruction should be informed by knowledge of students' experiences with mathematics instruction, their language history, and their educational background. In addition to knowing the details of students' experiences, research suggests that high-quality instruction for ELs that supports student achievement has two general characteristics: a view of language as a resource, rather than a deficiency; and an emphasis on academic achievement, not only on learning English (Gándara and Contreras, 2009).

Research provides general guidelines for instruction for this student population. Since students who are labeled as ELs, who are learning English, or who are bilingual are from non-dominant communities, they need access to curricula, instruction, and teachers proven to be effective in supporting academic success for this student population. The general characteristics of such environments are that curricula provide "abundant and diverse opportunities for speaking, listening, reading, and writing" and that instruction "encourage students to take risks, construct meaning, and seek reinterpretations of knowledge within compatible social contexts" (Garcia & Gonzalez, 1995, p. 424). Teachers with documented success with students from non-dominant communities share some characteristics: a) a high commitment to students' academic success and to student-home communication, b) high expectations for all students, c) the autonomy to change curriculum and instruction to meet the specific needs of students, and d) a rejection of models of their students as intellectually disadvantaged[ii].

Research on language that is specific to mathematics instruction for this student population provides several guidelines for instructional practices for teaching ELs mathematics. Mathematics instruction for ELs should: 1) treat language as a resource, not a deficit (Gándara and Contreras, 2009; Moschkovich, 2000); 2) address much more than vocabulary and support ELs' participation in mathematical discussions as they learn English (Moschkovich, 1999, 2002, 2007a, 2007b, 2007d); and 3) draw on multiple resources available in classrooms – such as objects, drawings, graphs, and gestures – as well as home languages and experiences outside of school. This research shows that ELs, even as they are learning English, can participate in discussions where they grapple with important mathematical content[iii]. Instruction for this population should not emphasize low-level language skills over opportunities to actively communicate about mathematical ideas. One of the goals of mathematics instruction for ELs should be to support all students, regardless of their proficiency in English, in participating in discussions that focus on important mathematical concepts and reasoning, rather than on pronunciation, vocabulary, or low-level linguistic skills. By learning to recognize how ELs express their mathematical ideas as they are learning English, teachers can maintain a focus on mathematical reasoning as well as on language development.

Research also describes how mathematical communication is more than vocabulary. While vocabulary is necessary, it is not sufficient. Learning to communicate mathematically is not merely or primarily a matter of learning vocabulary. During discussions in mathematics classrooms, students are also learning to describe patterns, make generalizations, and use representations to support their claims. The question is not whether students who are ELs should learn vocabulary but rather how instruction can best support students as they learn both vocabulary and mathematics. Vocabulary drill and practice is not the most effective instructional

practice for learning either vocabulary or mathematics. Instead, vocabulary and second-language-acquisition experts describe vocabulary acquisition in a first or second language as occurring most successfully in instructional contexts that are language-rich, actively involve students in using language, require both receptive and expressive understanding, and require students to use words in multiple ways over extended periods of time (Blachowicz and Fisher, 2000; Pressley, 2000). In order to develop written and oral communication skills students need to participate in negotiating meaning (Savignon, 1991) and in tasks that require output from students (Swain, 2001). In sum, <u>instruction should provide opportunities for students to actively use mathematical language to communicate about and negotiate meaning for mathematical situations</u>.

The recommendations provided in this paper focus on teaching practices that are simultaneously: a) aligned with the Common Core Standards for mathematics, b) support students in learning English, and c) support students in learning important mathematical content. Overall, the recommendations address the following questions: How can instruction provide opportunities for mathematical reasoning and sense making for students who are learning English? What instructional strategies support ELs' mathematical reasoning and sense making skills? How can instruction help EL students communicate their reasoning effectively in multiple ways?

2. Alignment with Common Core State Standards
The Common Core State Standards (CC) provide guidelines for how to teach mathematics for understanding by focusing on students' mathematical reasoning and sense making. Here I will only summarize four emphases provided by the CC to describe how mathematics instruction for ELs needs to begin by following CC guidelines and taking these four areas of emphasis seriously.

Emphasis #1 Balancing conceptual understanding and procedural fluency
Instruction should a) balance student activities that address both important conceptual and procedural knowledge related to a mathematical topic and b) connect the two types of knowledge.

Emphasis #2 Maintaining high cognitive demand
Instruction should a) use high-cognitive-demand math tasks and b) maintain the rigor of mathematical tasks throughout lessons and units.

Emphasis #3 Developing beliefs
Instruction should support students in developing beliefs that mathematics is sensible, worthwhile, and doable.

Emphasis #4 Engaging students in mathematical practices
Instruction should provide opportunities for students to engage in eight different mathematical practices: 1) Make sense of problems and persevere in solving them, 2) reason abstractly and quantitatively, 3) construct viable arguments and critique the reasoning of others, 4) model with

mathematics, 5) use appropriate tools strategically, 6) attend to precision, 7) look for and make use of structure, and 8) look for and express regularity in repeated reasoning.

We can see from these areas of emphasis that students should be focusing on making connections, understanding multiple representations of mathematical concepts, communicating their thought processes, and justifying their reasoning. Several of the mathematical practices involve language and discourse (in the sense of talking, listening, reading, and writing), in particular practices #3 and #8. In order to engage students in these mathematical practices, instruction needs to include time and support for mathematical discussions and use a variety of participation structures (teacher-led, small group, pairs, student presentations, etc.) that support students in learning to participate in such discussions.

According to a review of the research (Hiebert & Grouws, 2007), mathematics teaching that makes a difference in student achievement and promotes conceptual development in mathematics has two central features: one is that teachers and students attend explicitly to concepts, and the other is that teachers give students the time to wrestle with important mathematics. Mathematics instruction for ELs should follow these general recommendations for high-quality mathematics instruction to focus on mathematical concepts and the connections among those concepts and to use and maintain high-cognitive-demand mathematical tasks, for example, by encouraging students to explain their problem-solving and reasoning (AERA, 2006; Stein, Grover, and Henningsen, 1996).

One word of caution: concepts can often be interpreted to mean definitions. However, paying explicit attention to concepts does not mean that teachers should focus on providing definitions or stating general principles. Instead the CC and the National Council of Teachers of Mathematics (NCTM) Standards provide multiple examples of how instruction can focus on important mathematical concepts (e.g. equivalent fractions or the meaning of fraction multiplication, etc.). Similarly, the CC and NCTM also provide examples of how students can show their understanding of concepts (conceptual understanding) not by giving a definition or describing a procedure, but by using multiple representations. For example, students can show conceptual understanding by using a picture of a rectangle as an area model to *show* that two fractions are equivalent or how multiplication by a positive fraction smaller than one makes the result smaller, and pictures can be accompanied by oral or written explanations.

The preceding examples point to several challenges that students face in mathematics classrooms focused on conceptual understanding. Since conceptual understanding is most often made visible by showing a solution, describing reasoning, or explaining "why," instead of simply providing an answer, the CC shifts expectation for students from carrying out procedures to communicating their reasoning. Students are expected to a) communicate their reasoning through multiple representations (including objects, pictures, words, symbols, tables, graphs, etc.), b) engage in productive pictorial, symbolic, oral, and written group work with peers, c) engage in effective pictorial, symbolic, oral, and written interactions with teachers, d) explain and demonstrate their knowledge using emerging language, and e) extract meaning from written mathematical texts. The main challenges for teachers teaching mathematics are to teach

for understanding, support students to use multiple representations, and support students in using emerging and imperfect language to communicate about mathematical concepts. Since the CC documents already provide descriptions of how to teach mathematics for understanding and use multiple representations, the recommendations outlined below will focus on how to connect mathematical content to language, in particular through "engaging students in mathematical practices" (Emphasis #4).

3. Recommendations for Connecting Mathematical Content to Language

Recommendation #1: Focus on students' mathematical reasoning, not accuracy in using language.
Instruction should focus on uncovering, hearing, and supporting students' mathematical reasoning, not on accuracy in using language (either English or a student's first language). When the goal is to engage students in mathematical practices, student contributions are likely to first appear in imperfect language. Teachers should not be sidetracked by expressions of mathematical ideas or practices expressed in imperfect language. Instead, teachers should first focus on promoting and privileging meaning, no matter the type of language students may use. Eventually, after students have has ample time to engage in mathematical practices both orally and in writing, instruction can then carefully consider how to move students toward accuracy.

As a teacher, it can be difficult to understand the mathematical ideas in students' talk in the moment. However, it is possible to take time after a discussion to reflect on the mathematical content of student contributions and design subsequent lessons to address these mathematical concepts. But, it is only possible to uncover the mathematical ideas in what students say if students have the opportunity to participate in a discussion and if this discussion is focused on mathematics. Understanding and re-phrasing student contributions can be a challenge, perhaps especially when working with students who are learning English. It may not be easy (or even possible) to sort out what aspects of what a student says are due to the student's conceptual understanding or the student's English language proficiency. However, <u>if the goal is to support student participation in a mathematical discussion and in mathematical practices, determining the origin of an error is not as important as listening to the students and uncovering the mathematical content in what they are saying.</u>

Recommendation #2: Shift to a focus on mathematical discourse practices, move away from simplified views of language.
In keeping with the CC focus on *mathematical practices* (Emphasis #4) and research in mathematics education, the focus of classroom activity should be on student participation in mathematical discourse practices (explaining, conjecturing, justifying, etc.). Instruction should move away from simplified views of language as words, phrases, vocabulary, or a list of definitions. In particular, teaching practices need to move away from oversimplified views of language as vocabulary and leave behind an overemphasis on correct vocabulary and formal language, which limits the linguistic resources teachers and students can use in the classroom to learn mathematics with understanding. Work on the language of disciplines provides a

complex view of mathematical language as not only specialized vocabulary – new words and new meanings for familiar words – but also as extended discourse that includes syntax, organization, the mathematics register, and discourse practices. Instruction needs to move beyond interpretations of the mathematics register as merely a set of words and phrases that are particular to mathematics. The mathematics register includes styles of meaning, modes of argument, and mathematical practices and has several dimensions such as the concepts involved, how mathematical discourse positions students, and how mathematics texts are organized.

Another simplified view of language is the belief that precision lies primarily in individual word meaning. For example, we could imagine that *attending to precision* (mathematical practice #6) means using two different words for the set of symbols "x+3" and the set of symbols "x+3 =10." If we are being precise at the level of individual word meaning, the first is an "expression" while the second is an "equation." However, attending to precision is not so much about using the perfect word; a more significant mathematical practice is making claims *about precise situations*. We can contrast the claim "Multiplication makes bigger," which is not precise, with the question and claim "When does multiplication make the result bigger? Multiplication makes the result bigger when you multiply by a number greater than 1." Notice that when contrasting these two claims, precision does not lie in the individual words nor are the words used in the more precise claim fancy math words. Rather, the precision lies in the *mathematical practice* of specifying when the claim is true. In sum, instruction should move away from interpreting precision to mean using the precise word, and instead focus on how precisions works in mathematical practices.

One of the eight mathematical practices, "Attend to precision" (Number 6), is open to such multiple interpretations of the term "precision." It is important to consider what we mean by *precision* for all students learning mathematics, since all students are likely to need time and support for moving from expressing their reasoning and arguments in imperfect form. However, it is essential for teachers of ELs to consider when and how to focus on precision for ELs. Although students' use of imperfect language is likely to interact with teachers' own multiple interpretations of precision, we should not confuse the two. In particular, we should remember that precise claims can be expressed in imperfect language and that attending to precision at the individual word meaning level will get in the way of students' expressing their emerging mathematical ideas. More work is needed to clarify how to guide practitioners in helping students become more precise in their language over time.

Recommendation #3: Recognize and support students to engage with the complexity of language in math classrooms.
Language in mathematics classrooms is complex and involves a) multiple modes (oral, written, receptive, expressive, etc.), b) multiple representations (including objects, pictures, words, symbols, tables, graphs, etc.), c) different types of written texts (textbooks, word problems, student explanations, teacher explanations, etc.), d) different types of talk (exploratory and expository), and e) different audiences (presentations to the teacher, to peers, by the teacher, by peers, etc.). "Language" needs to expand beyond talk to consider the interaction of the three

semiotic systems involved in mathematical discourse – natural language, mathematics symbol systems, and visual displays. <u>Instruction should recognize and strategically support EL students' opportunity to engage with this linguistic complexity.</u>

Instruction needs to distinguish among multiple modalities (written and oral) as well as between receptive and productive skills. Other important distinctions are between listening and oral comprehension, comprehending and producing oral contributions, and comprehending and producing written text. There are also distinctions among different mathematical domains, genres of mathematical texts (for example word problems and textbooks). Instruction should support movement between and among different types of texts, spoken and written, such as homework, blackboard diagrams, textbooks, interactions between teacher and students, and interactions among students[iv]. <u>Instruction should: a) recognize the multimodal and multi-semiotic nature of mathematical communication, b) move from viewing language as autonomous and instead recognize language as a complex meaning-making system, and c) embrace the nature of mathematical activity as multimodal and multi-semiotic</u> (Gutierrez et al., 2010; O'Halloran, 2005; Schleppegrell, 2010).

Recommendation #4: Treat everyday language and experiences as resources, not as obstacles.
Everyday language and experiences are not necessarily obstacles to developing academic ways of communicating in mathematics. It is not useful to dichotomize everyday and academic language. Instead, instruction needs to consider how to support students in connecting the two ways of communicating, building on everyday communication, and contrasting the two when necessary. In looking for mathematical practices, we need to consider the spectrum of mathematical activity as a continuum rather than reifying the separation between practices in out-of-school settings and the practices in school. Rather than debating whether an utterance, lesson, or discussion is or is not mathematical discourse, teachers should instead explore what practices, inscriptions, and talk mean to the participants and how they use these to accomplish their goals. <u>Instruction needs to a) shift from monolithic views of mathematical discourse and dichotomized views of discourse practices and b) consider everyday and scientific discourses as interdependent, dialectical, and related rather than assume they are mutually exclusive.</u>

The ambiguity and multiplicity of meanings in everyday language should be recognized and treated not as a failure to be mathematically precise but as fundamental to making sense of mathematical meanings and to learning mathematics with understanding. Mathematical language may not be as precise as mathematicians or mathematics instructors imagine it to be. Although many of us may be deeply attached to the precision we imagine mathematics provides, ambiguity and vagueness have been reported as common in mathematical conversations and have been documented as resources in teaching and learning mathematics (e.g., Barwell, 2005; Barwell, Leung, Morgan, & Street, 2005; O'Halloran, 2000; Rowland, 1999). Even definitions are not a monolithic mathematical practice, since they are presented differently in lower-level textbooks – as static and absolute facts to be accepted – while in journal articles they are presented as dynamic, evolving, and open to revisions by the mathematician. Neither should textbooks be seen as homogeneous. Higher-level textbooks are

more like journal articles in allowing for more uncertainty and evolving meaning than lower-level textbooks (Morgan, 2004), evidence that there are multiple approaches to the issue of precision, even in mathematical texts.

Recommendation #5: Uncover the mathematics in what students say and do.
Teachers need to learn how to recognize the emerging mathematical reasoning learners construct in, through, and with emerging language. In order to focus on the mathematical meanings learners construct rather than the mistakes they make or the obstacles they face, curriculum materials and professional development will need to support teachers in learning to recognize the emerging mathematical reasoning that learners are constructing in, through, and with emerging language (and as they learn to use multiple representations). <u>Materials and professional development should support teachers so that they are better prepared to deal with the tensions around language and mathematical content, in particular a) how to uncover the mathematics in student contributions, b) when to move from everyday to more mathematical ways of communicating, and c) when and how to approach and develop "mathematical precision."</u> Mathematical precision seems particularly important to consider because it is one of the mathematical practices in the Common Core that can be interpreted in multiple ways (see Recommendations #2 and #4 for examples).

In sum, materials and professional development should raise teachers' awareness about language, provide teachers with ways to talk explicitly about language, and model ways to respond to students. Teachers need support in developing the following competencies (Schleppegrell, 2010): using talk to effectively build on students' everyday language as well as developing their academic mathematical language; providing interaction, scaffolding, and other supports for learning academic mathematical language; making judgments about defining terms and allowing students to use informal language in mathematics classrooms, and deciding when imprecise or ambiguous language might be pedagogically preferable and when not.

4. Closing Comments
Three issues are not addressed in the preceding recommendations: assessment, reading, and effective vocabulary instruction. Assessment is crucial to consider for ELs, because there is a history of inadequate assessment of this student population. LaCelle-Peterson and Rivera (1994, 2) write that ELs "historically have suffered from disproportionate assignment to lower curriculum tracks on the basis of inappropriate assessment and as a result, from over referral to special education (Cummins 1984; Durán 1989)." Previous work in assessment has described practices that can improve the accuracy of assessment in mathematics classrooms for this population. Assessment activities in mathematics should match the language of assessment with language of instruction, and include measures of content knowledge assessed through the medium of the language or languages in which the material was taught (LaCelle-Peterson and Rivera, 1994). Assessments should be flexible in terms of modes (oral and written) and length of time for completing tasks. <u>Assessments should track content learning through oral reports and other presentations rather than relying only on written or one-time assessments.</u> When students are first learning a second language, they are able to display content knowledge more easily by showing and telling, rather than through reading text or choosing from verbal options

on a multiple-choice test. Therefore, discussions with a student or observations of hands-on work will provide more accurate assessment data than written assessments. Evaluation should be clear as to the degree to which "fluency of expression, as distinct from substantive content" is being evaluated. This last recommendation raises an important challenge for assessing ELs' mathematical proficiency: <u>Classroom assessments based on mathematical discussions need to evaluate *content* knowledge as distinct from fluency of expression in English</u>[v].

Learning to read mathematical texts is a topic that needs further research. Studies need to examine how ELs learn to read different mathematical texts (textbooks, word problems, etc.). In designing this research it is important to *differentiate between reading textbooks and reading word problems, two different genres in mathematical written discourse.* When working with children learning to read in English, it will be important to distinguish between children who are competent readers in a first language and children who are not. Lastly, since "language" seems to be so closely associated with "vocabulary," we should develop principled and research-based best practices for supporting students in learning to use vocabulary in mathematics classrooms. Research should explicitly consider more and less successful ways for ELs to learn vocabulary in mathematics. This work will need to start by establishing what vocabulary assessment instruments are relevant to ELs learning mathematics.

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[i] I sometimes use the term "language(s)" as a reminder that there is no pure unadulterated language and that all language is hybrid.

[ii] Curriculum policies for ELs in mathematics should follow the guidelines for traditionally underserved students (AERA, 2006), such as instituting systems that broaden course-taking options and avoiding systems of tracking students that limit their opportunities to learn and delay their exposure to college-preparatory mathematics coursework.

[iii] For examples of lessons where ELs participate in mathematical discussions, see Moschkovich, 1999 and Khisty, 1995.

[iv] Topics for further research include defining linguistic complexity for mathematical texts and providing examples of linguistic complexity that go beyond readability (such as the syntactic structure of sentences, underlying semantic structures, or frequency of technical vocabulary, verb phrases, conditional clauses, relative clauses, and so on).

[v] For examples of how assessment and instruction can focus on mathematical content and reasoning see Appendix A, Moschkovich (1999) and Moschkovich (2007a).

Appendix A: A Classroom Vignette

This vignette is presented to ground the subsequent descriptions of the recommendations and to show how these recommendations play out in classroom interactions. The lesson excerpt presented below (Moschkovich,1999) comes from a third-grade bilingual classroom in an urban California school[i]. In this classroom, there were thirty-three students identified as Limited English Proficient. In general, this teacher introduced students to topics in Spanish and then later conducted lessons in English. The students had been working on a unit on two-dimensional geometric figures. For several weeks, instruction had included vocabulary such as "radius," "diameter," "congruent," "hypotenuse," and the names of different quadrilaterals in both Spanish and English. Students had been talking about shapes and the teacher had asked them to point, touch, and identify different shapes. The teacher identified this lesson as an English as a Second Language mathematics lesson, one where students would be using English in the context of folding and cutting to make Tangram pieces (see Figure 1).
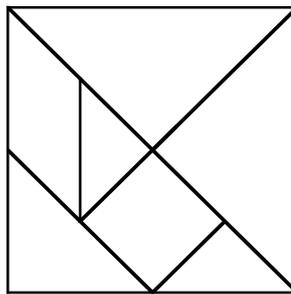
Figure 1: A tangram puzzle

Vignette

1.	Teacher:	Today we are going to have a very special lesson in which you really gonna have to listen. You're going to put on your best, best listening ears because I'm only going to speak in English. Nothing else. Only English. Let's see how much we remembered from Monday. Hold up your rectangles . . . high as you can. (Students hold up rectangles) Good, now. Who can describe a rectangle? Eric, can you describe it [a rectangle]? Can you tell me about it?
2.	Eric:	A rectangle has . . . two . . . short sides, and two . . . long sides.
3.	Teacher:	Two short sides and two long sides. Can somebody tell me something else about this rectangle, if somebody didn't know what it looked like, what, what . . . how would you say it.
4.	Julian:	Paralela [holding up a rectangle, voice trails off].
5.	Teacher:	It's parallel. Very interesting word. Parallel. Wow! Pretty interesting word, isn't it? Parallel. Can you describe what that is?
6.	Julian:	Never get together. They never get together [runs his finger over the top side of the rectangle].

7.	Teacher:	What never gets together?
8.	Julian:	The parallela . . . they . . . when they go, they go higher [runs two fingers parallel to each other first along the top and base of the rectangle and then continues along those lines], they never get together.
9.	Antonio:	Yeah!
10.	Teacher:	Very interesting. The rectangle then has sides that will never meet. Those sides will be parallel. Good work. Excellent work.

The vignette serves to show that English language learners can and do participate in discussions where they grapple with important mathematical content. Students were grappling not only with the definitions for quadrilaterals but also with the concept of parallelism. Student were engaged in mathematical communication because they were making claims, generalizing, imagining, hypothesizing, and predicting what will happen to two lines segments if they are extended indefinitely. To communicate about these mathematical ideas students used words, objects, gestures, and other students' utterances as resources. This vignette also illustrates several instructional strategies that can be useful in supporting student participation in mathematical discussions. Some of these strategies are: asking for clarification, re-phrasing student statements, accepting and building on what students say, and probing what students mean. It is important to notice that this teacher did *not* focus directly on vocabulary development but instead on mathematical ideas and arguments as he interpreted, clarified, and rephrased what students were saying. This teacher provided opportunities for discussion by moving past student grammatical or vocabulary errors, listening to students, and trying to understand the mathematics in what students said. He kept the discussion mathematical by focusing on the mathematical content of what students said and did.

Recommendation #1: Focus on Students' Mathematical Reasoning, Not Accuracy in Using Language.

In the vignette: Uncovering the mathematical content in Julian's contributions is certainly a complex endeavor. Julian's utterances in turns 4, 6, and 8 are difficult both to hear and interpret. He uttered the word "parallela" in a halting manner, sounding unsure of the choice of word or of its pronunciation. His voice trailed off, so it is difficult to tell whether he said "parallelo" or "parallela." His pronunciation could be interpreted as a mixture of English and Spanish; the "ll" sound being pronounced in English and the addition of the "o" or "a" being pronounced in Spanish. The grammatical structure of the utterance in line 8 is intriguing. The apparently singular "parallela" is preceded by the word "the" which can be either plural or singular and then followed with a plural "when they go higher." In any case, what is clear is that Julian made several attempts to communicate a mathematical idea in his second language. If we only focus only on his English proficiency, we would miss his mathematical reasoning. Julian is, in fact, accurately describing a property of parallel lines.

This teacher moved past Julian's unclear utterance and use of the term "parallela." He focused on the mathematical content of what students said, not the mistakes they made. He attempted to uncover the mathematical content in what Julian had said. He did not correct Julian's English, but instead asked questions to probe what the student meant.

Recommendation #2: Shift to a Focus on Mathematical Discourse Practices, Move Away from Simplified Views of Language.

In the vignette: What competencies in mathematical practices did Julian display? Julian was participating in three central mathematical practices: abstracting, generalizing, and imagining. He was describing an *abstract* property of parallel lines and making a generalization saying that parallel lines will *never* meet. He was also imagining what happens when the parallel sides of a rectangle are extended. If we only focused on vocabulary, we would miss Julian's use of these important mathematical practices.

Recommendation #3: Recognize and Support Students to Engage with the Complexity of Language in Mathematics Classrooms.

In the vignette: What modes of expression did Julian and the teacher use? Julian used gestures and objects in his description, running his fingers along the parallel sides of a paper rectangle. The teacher also used gestures and visual displays of geometric figures on the blackboard. This example shows some of the complexity of language in the mathematics classroom.

Recommendation #4: Treat Everyday Language and Experiences as Resources, Not as Obstacles.

In the vignette: What language resources did Julian use to communicate his mathematical ideas? He used colloquial expressions such as "go higher" and "get together" rather than the formal terms "extended" or "meet." These everyday expressions were not obstacles but resources[ii].

Recommendation #5: Uncover the Mathematics in What Students Say and Do.

In the vignette: How did the teacher respond to Julian's contributions? The teacher moved past Julian's confusing uses of the word "parallela" to focus on the mathematical content of Julian's contribution. He did not correct Julian's English, but instead asked questions to probe what the student meant. This response is significant in that it represents a stance towards student contributions during mathematical discussion: listen to students and try to figure out what they are saying. When teaching English learners, this means moving beyond vocabulary, pronunciation, or grammatical errors to listen for the mathematical content in student contributions. (For a discussion of the tensions between these two, see Adler, 2001.)

In the vignette: What instructional strategies did the teacher use? The teacher used gestures and objects, such as the cardboard geometric shapes, to clarify what he meant. For example, he pointed to vertices and sides when speaking about these parts of a figure. Although using objects to clarify meanings is an important ESL instructional strategy, it is crucial to understand that these objects do not have meaning that is *separate* from language. Objects acquire meaning as students talk about them and these meanings are negotiated through talk. Although the teacher and the students had the geometric figures in front of them, and it seemed helpful to use the objects and gestures for clarification, students still needed to sort out what 'parallelogram' and 'parallel' meant by using language and negotiating common meanings for these words.

In the vignette: The teacher did not focus on vocabulary instruction but instead supported students' participation in mathematical arguments by using three instructional strategies that focus more on mathematical discourse: 1) **Building on student responses**: The teacher accepted and built on student responses. For example in turns 4-5, the teacher accepted Julian's response and probed what he meant by "parallel." 2) **Asking for clarification:** The teacher prompted the students for clarification. For example, in turn 7 the teacher asked Julian to clarify what he meant by "they."
3) **Re-phrasing**: The teacher re-phrased (or re-voiced) student statements, by interpreting and rephrasing what students said. For example, in turn 10 the teacher rephrased what Julian had said in turn 8. Julian's "the parallela, they" became the teacher's "sides" and Julian's "they never get together" became "will never meet". The teacher thus built on Julian's everyday language as he re-voiced Julian's contributions using more academic language.

Language Demands and Opportunities in Relation to Next Generation Science Standards for English Language Learners: What Teachers Need to Know

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This paper discusses challenges and opportunities expected as English language learners (ELLs) engage with Next Generation Science Standards (NGSS). We subscribe to a view of language learning and proficiency that is most concerned with students' ability to use language to function in the context of their lives both in and out of school. We have discussed this view of second language acquisition and its implications for the science classroom in greater detail in a separate paper. Here, we concern ourselves with learning opportunities for ELLs in an English-speaking science classroom in which NGSS have been implemented based on the National Research Council (NRC, 2011) document "*A framework for K-12 science education: Practices, crosscutting concepts, and core ideas*" (hereafter called "the Framework").

The Framework (NRC, 2011) refines and deepens the meaning of the term "inquiry-based science" by identifying a set of science and engineering practices. These practices are both a representation of what scientists do as they engage in scientific inquiry and a necessary part of what students must do to learn science and understand the nature of science. There is a parallel between the Framework's assertion that learning science requires students to engage in these practices, and our claim that meaningful "language for use" learning occurs in contexts where students are required to communicate (speak, listen, read and write) about science. A practice-oriented science classroom can be a rich language-learning as well as science-learning environment, provided teachers ensure that ELLs are supported to participate. Indeed it is a language learning environment for all students, as the discipline itself brings patterns of discourse and terminology that are unfamiliar to most of them. In this context, teacher knowledge about language and language learning support strategies can improve the overall science learning experience of all students, especially of ELLs. We do not suggest that science teachers should function as language teachers, but rather as supporters of the language learning that occurs in a content-rich and discourse-rich classroom environment.

Next Generation Science Standards: Focus on Science and Engineering Practices

The Framework defines science learning as having three dimensions: (1) science and engineering practices, (2) crosscutting concepts, and (3) core ideas in each science discipline. The central content of the Framework document is a detailed explanation of what is intended in each dimension, how the three dimensions should be integrated in curriculum and instruction, and how these dimensions progress in sophistication across K-12.

The framework defines eight science and engineering practices:

1) Asking questions (for science) and defining problems (for engineering);
2) Developing and using models;
3) Planning and carrying out investigations;
4) Analyzing and interpreting data;
5) Using mathematics and computational thinking;
6) Constructing explanations (for science) and developing designs (for engineering);
7) Engaging in argument from evidence; and
8) Obtaining, evaluating and communicating information.

Engagement in any of the practices involves both scientific sense-making and language use. The practices intertwine with one another in the sense-making process. This sense-making is a key endeavor for students as it helps them transition from their naïve conceptions of the world to more scientifically-based conceptions. In particular, we focus here on four of the eight practices, namely 2, 6, 7 and 8. These four practices are selected for the following reasons.

First, these practices represent a major shift. Even where science has been taught in an activity rich "inquiry-based" classroom, the practices related to investigation have often been stressed without an equivalent stress on the four sense-making practices highlighted here. Particularly in the lower grades the activity often ends at the stage of recording observations, with minimal attention paid to interpreting them and almost no attention to constructing models or explanations and refining them through argumentation from evidence.

Second, these practices are deeply interrelated because each is used to support effective engagement in the others. Argumentation from evidence requires students to apply both mental and diagrammed models that clarify their thinking and to develop model-based explanations using evidence (data and observations), logic, and information obtained from outside sources or prior experience. To develop an explanation and examine its success or failure in explaining all the evidence about a phenomenon or system requires argumentation. Clearly students must obtain, evaluate and communicate information as they engage in the process of building and critiquing explanations.

Third, engagement in these practices requires classroom science discourse, which demands both receptive and productive language skills. Students read, write, and visually represent as they develop their models and explanations. They speak and listen as they present their ideas and engage in reasoned argumentation with others to refine them and reach shared conclusions. This offers rich opportunities and demands for language learning at the same time that it supports science learning. Hence these practices merit special attention in science classrooms that include ELLs.

Finally, teachers implementing these practices need an understanding both of the practices and of strategies to engage all students in them regardless of students' English proficiency. The classroom culture of argumentation must be developed and supported to ensure that all voices are respected and included, even as the process reveals flaws in a student's model or explanation or limitations of their language proficiency.

Intersections between Science Practices and Language Learning

The learning of school subjects takes place through the use of language in oral and written forms. This section addresses two issues: (1) language skills involved as students engage in science and engineering practices and (2) features of science text and science talk.

Language Intensive Tasks to Engage in Science and Engineering Practices
Students develop facility with all of the eight science practices by using them in a concerted way to support sense-making about a phenomenon or system. Through an iterative cycle of engaging in these practices students develop understanding of science. Language is essential to successfully engage in any of these practices and all of the practices provide language learning opportunities, particularly the four that we discuss below. Engagement in these practices in the classroom both *demands* and *affords* rich student discourse. The discourse of the science classroom, and of science textbooks as well, differs from the everyday discourse of students and from that of a mathematics or language arts classroom or textbook. It is also distinct from the professional discourse and writing of scientists though it mirrors the conventions of that discourse more closely as the students advance across the grades.

The teacher must define and facilitate a classroom culture of discourse. This culture should be inclusive, accepting contributions for their meaning and their value in the discourse however flawed or informal the language of the speaker. It should support students to maintain a spirit of shared sense-making and discovery while they question others, ask for further explanation, and provide arguments that refute an idea expressed. Most importantly for ELLs, it allows students to hear many examples of the discourse that they are expected to produce.

Below we elaborate on the four highlighted practices, stressing the language learning opportunities that they provide as well as their roles in science learning.

Developing and Using Models. Each phenomenon or system under investigation demands description via a model. In developing a model, students operate with language and diagrams as well as with observations of the system in question. The model may include reference to a graph of some data or an equation describing a relationship between quantities. Precise observation demands both precise descriptive language – of which many examples must be provided – and carefully constructed diagrammatic representation. Diagrams can display both the seen (e.g., objects) and the inferred (e.g., force arrows, energy flow across an imagined system boundary) aspects of the system. Diagrams and graphs require labels to help students communicate all that has been observed and inferred about
the system.

At all grades students can produce, describe and apply models of a system under study. What progresses across the grades are the sophistication and abstraction of the models that they work with and of the language and diagrams or other representations contained within their description of their model. This progress is aided when the teacher leads students to discuss examples of models, as well as ways to describe them that incorporate higher-level features. The interplay between diagrammatic representations of models, or three-dimensional models, of a system and the language used to describe these representations both builds students' conceptual understanding of the system in question and refines their ability to talk about it. Teaching strategy and repeated practice develops students' ability to make explicit a mental model of a system or process, expose contradictions between observations and the current mental model, and modify the mental model toward a more scientifically-supported one.

The practice of developing and using models provides an initially nonverbal way to express a thought or an understanding. Using models to explain and describe systems provides students an impetus to name aspects or parts of their own model and to speak about how it explains observations. In doing so, students refine their understanding of needed scientific terminology. With a model in hand students can say "this piece here . . . ." and then have a reason to want to know that the piece is called a *cog* or a *flagellum*. This helps students to learn appropriate language in context as they express their ideas and grow in their understanding of the system under study.

Models are useful as more than a record of observation – they support the development of explanations for phenomena. As students support their explanations with reference to their models, their thinking is made more visible and explicit, both to themselves and to others. Language is the essential tool for them to engage in explanations and arguments with their peers around the model at hand. Students' ability to use language precisely is supported by the visual representation of their model. For ELLs the progression from observation of a system to modeling a system, to using language about the system, provides a rich language-learning experience where the learning is driven by the classroom discourse around the objects and ideas being considered and represented.

Developing Explanations (for Science) and Designing Solutions (for Engineering). The process of science is to make ever more precise and explicit explanations of phenomena, while engineering likewise requires precision and explicit features in a design solution. The level of explicit detail of observation and explanation required by science and engineering is not common in everyday experience; it demands a comparable level of precision in language use. Models are an important step in the development of an explanation of how something happens or of an idea for a design solution. When students are provided examples of diagrams and descriptions of models and then diagram and describe the model that underlies their proffered explanation or design, they become more explicit about their ideas. This move toward explicit detail occurs even when students do not yet have the language to be explicit if simply asked for a verbal explanation or design proposal. Thus like the process of developing models, the process of developing explanations and designs involves language development, mediated by diagrams, lists, charts and other elements of models and observations and examples of the types of verbal explanations that are the end goal of student learning.

As students are asked to explain their ideas or designs and critique those of others, including written examples, they learn from the experience of encountering multiple examples of the level of precision and detail that scientific thinking requires. Likewise students' ability to use technical terminology develops because they need the precision that it offers. This process needs teacher support but it is not helpful to insist on distinctions in terminology for which the student does not yet have access to distinctions in concept. This is particularly true for words such as *energy* that have an everyday usage broader and less defined than their scientific meaning. The development of correct scientific language usage comes from the development of scientific concepts through experience and application; it cannot be achieved by learning definitions. In this sense all students are language learners.

Engaging in Argument from Evidence. Argument is a discourse practice, whether practiced in writing or verbally. Across all disciplines an argument can be deconstructed as a claim and the logic and evidence used to support or refute that claim. What counts as evidence is discipline-specific. In science what counts as evidence is data and observations. Hence argumentation in

science is not a purely verbal exercise. It is an exercise in the coordination of language and experience and thus another rich language learning opportunity.

As students analyze written examples of arguments they learn the characteristics of a strong scientific justification of a claim and they learn to identify weak support. As they engage in argument with others to arrive at a shared "best" explanation or model, they are motivated to clarify both their language and their thinking by the atmosphere of shared interest and goals.

Obtaining, Evaluating and Communicating Information. This practice, more than any other, points to reading and writing as well as to listening and speaking. It is here that the student meets the difficulties of reading and interpreting scientific writing, though typically not at the level of scientific papers. The writing in question is that of textbooks, science-related trade books, websites and popular articles about science. Each of these genres has different language conventions.

Particular challenges for ELLs arise when they are asked to read textbooks or other written materials about a science topic. Challenges can be of two types. First, ELLs may not have developed strong reading skills if their previous ESL instruction primarily focused on grammatical structures. They will therefore need support in the development of reading comprehension proficiencies. Second, the language style and complexity of texts written for science learners is different from those of other written genres encountered in other school subjects and from spoken language, as we discuss below. Thus all students need support and strategies for reading these materials.

Students need multiple opportunities to write after they have been guided in examining examples of the type of writing that is required. For example, if students are to be asked to regularly use journals to develop and express their own understanding and to engage in metacognition about it, they need to see examples of such writing. Similarly, before they are expected to give oral presentations and written reports that demonstrate what they have understood or to describe an investigation or design project, they should be given examples of such presentations and reports. The point of this work is science understanding and science communication; these exercises should not become tests of accuracy and fluency of language production. Opportunities to revise and correct are appropriate for formal reports; however, for journal writing the emphasis should be on rethinking rather than on rewriting. Nevertheless students must understand what writing that reflects thinking looks like as well as what it includes and does not include.

Features of Science Language

It is helpful for science teachers to understand that not only technical terms, but also other features of science text and science talk, may make them difficult for students to understand. All students encounter these difficulties, but problems may be magnified for ELLs who have not had access to good instruction. We here briefly review these features.

Science vocabulary. As they engage with science students need to code-switch from everyday uses of language to the language of science (Brown & Ryoo, 2008; Moje, Collazo, Carillo, & Marx, 2001). Within science vocabulary there are different types of challenges for students. First, some everyday words have science-specific meanings that are different from or more narrowly-defined than their everyday meanings (e.g., *force*, *energy*, *work*, *cell*, *space*, *fault*). Second, general academic vocabulary that is used across disciplines (e.g., *compare*, *infer*,

analyze, *evaluate*; tier II words according to Beck, McKeown, & Kucan, 2002) present challenges. Third, discipline specific words invented and defined for science use (e.g., *gene*, *biome*, *proton*; tier III words according to Beck et al., 2002) are new to most students, even those with fluency in everyday English. Finally, even everyday words can make subtle shifts in meaning as they are used in science. For example, in everyday English, "Why did that happen?" may be asking about the motivations of those that made it happen, whereas in the natural sciences it is asking students to restrict their attention to the mechanisms and conditions that caused the effect.

Science Discourse. Each area of science has different disciplinary discourse conventions, adapted to what has proven effective and efficient for communication among experts. Learning the register of discourse of a discipline is a form of socialization into how members of the discipline talk, write, and participate in the knowledge construction. These differences are reflected in science textbooks and classroom talk, which have registers specific to a discipline and grade level. Students must absorb these differences in register as they work to construct meaning appropriate to the topic at hand.

Science discourse at any level requires students to attend to and argue about precise meanings. This demand for attention to precision and attention to detail goes beyond the meaning of technical vocabulary, to the evidence and logic of connecting cause and effect, and the validity of claims or warrants. Students must develop an understanding of the forms of this discourse as well those used in written science text.

Multiple Modes of Representation. Science information is conveyed not just through oral or textual forms but also through visual and mathematical representations, including pictures, diagrams, graphs, charts, tables, maps, and equations. Students need to master these non-linguistic modes of representation to gain an understanding of science. In addition they need to coordinate information presented through the various modes into a single coherent understanding of the material being presented or a coherent presentation of their own ideas. For ELLs the coordination of these multiple representations provides an additional path to language learning, as well as to science learning.

Science Texts. Discipline-specific texts written for learners typically have particular features that over time have been thought to provide the most effective way for the content of that discipline to be expressed. It is helpful for students to examine these features and discuss why they are used. Recent analyses of the written language of secondary science texts carried out from the perspective of Systemic Functional Linguistics have found that these text structures are complex and include lexical, syntactic, and discourse structures that are not typically present in everyday language (Fang & Schleppegrell, 2008; Halliday & Martin, 1993; Halliday & Matthiessen, 2004; Schleppegrell, 2004). Key features include:

- Authoritativeness to "suppress" human agents behind events, concepts, and discoveries and to render the scientific discourse more objective or timeless through simple present tense, passive voice, generalized or virtual participants ('scientists,' 'research team members'), and hidden evaluations ('claimed,' 'confirmed').

- Nominalization of verbs or adjectives into nouns to economically summarize sentences into one abstract noun phrase

- Long and complex noun phrases and clauses to effectively pack complex content within shorter sentences

- Technical vocabulary to use terms with specialized meanings in science lexical density to "pack" texts with more information

Supporting Science and Language Learning for ELLs

We note five areas where teachers can support science and language for ELLs: (1) literacy strategies with all students, (2) language support strategies with ELLs, (3) discourse strategies with ELLs, (4) home language support, and (5) home culture connections.

Literacy Strategies. In science classrooms, effective teachers incorporate reading and writing strategies in their instruction to promote both science learning and literacy development for all students (Douglas, Klentschy, Worth, & Binder, 2006). These strategies include activating prior knowledge, having explicit discussion of reading strategies for scientific texts, prompting students to use academic language functions (e.g., *describe*, *explain*, *predict*, *infer*, *conclude*) in science practices, requiring and exemplifying scientific genres of writing (e.g., keeping a science journal, investigation or design reports, conference posters), teaching the uses of graphic organizers (e.g., concept map, word wall, Venn diagram), encouraging reading trade books or literature with scientific themes, and providing journal writing prompts (e.g., *I observed…, I noticed…, I wondered…, I inferred…*) as part of an investigation protocol.

It is not a service to language learners to "protect" them from the demands of subject area reading. If they are to reach grade level understanding of a topic, they will need strategies for reading the relevant text and interpreting its complex sentences, as well as for linking these to diagrams, data charts and equations that appear in the same section. In supporting students to read and understand scientific texts, it is more important to provide them with strategies for sense making and ways to "decode" complex sentences and to coordinate text and diagrams than to provide vocabulary lists and glossaries. Word definitions are indeed sometimes needed but they are better learned by use in context than by memorizing a vocabulary list. Dictionary use is likewise a helpful but limited strategy. (However, ELLs should be encouraged to use an English to English dictionary to interpret unfamiliar words before resorting to a translation dictionary.)

Students are expected to learn how to describe, explain, and predict phenomena in science-specific genres of writing (Hand, Wallace, & Yang, 2004; Palincsar & Magnusson, 2001). They need to report science investigations and design projects in multiple-mode formats (e.g., those that include written description plus graphs of data, diagrams of equipment or observations). Additionally, students need to code-switch from everyday uses of language (e.g., telling or writing stories) to the language of science (Brown & Ryoo, 2008; Brown & Spang, 2008). To perform the kinds of writing tasks described here, all students, but particularly ELLs, benefit from multiple examples of the desired product, annotated and discussed by the whole class or in small groups to examine the organizational structure and particular features. For example, without teaching the passive voice as such, teachers can certainly call students' attention to the fact that all the actions in a particular paragraph have no specified agent (e.g., data are examined, conclusions are reached) and that this is a common feature of scientific writing.

ELLs' needs with respect to written materials used in science class require ongoing attention from teachers. The joint goals of science and language learning must both be considered as

strategies that are chosen to assist any student in mastering a difficult reading assignment. The appropriate strategy for a student depends on the student's language level, reading level, and science comprehension level. The more the teacher is aware of all three through their observation (formative assessment) of the student, the better s/he can match the student's needs.

Language Support Strategies

To support ELLs in learning science and developing English proficiency simultaneously, teachers engage students in purposeful activities, ensure that students experience multiple examples of language in use, and call students' attention to the ways in which language is used to communicate meaning in science. They encourage students to communicate and reflect about ideas and to engage with others in sense-making talk and activity. They encourage non-linguistic modes of representation (e.g., graphs, charts, tables, diagrams, pictures), as well as language production. They guide students to comprehend, through use in context, key science vocabulary – both general academic terms (tier II words) and discipline specific terms (tier III words) (Beck et al., 2002). All these strategies for science teaching support ELLs, provided teachers ensure that these students are full members of the classroom science discourse community.

Student journals of their science activity and thinking are a major tool used in many science classrooms and they can also provide support for language learning. Students are encouraged to use their journals to record observations, develop explicit representations of their models, and analyze their experiences and understandings of what they are learning in science. This is not formal science writing; it is writing to make thinking explicit. Journals become an effective tool only if they are used regularly and if in-class time is provided for reflective writing about what has just occurred in an activity or a discussion. Early stage ELLs may gain science understanding by doing this writing initially in their first language *if they have been instructed in this language,* but should be encouraged to then restate (rather than to translate) this thinking in English. As language proficiency in English develops, the student should be encouraged to transition to thinking and writing in English.

Discourse Strategies. Discourse strategies can be used to enhance ELLs' understanding of academic content (i.e., adjust the level and mode of communication). Discourse strategies focus specifically on the teacher's role in facilitating ELLs' participation in classroom discourse (Gibbons, 2006). A major challenge for teachers is in how to structure activities so as to reduce the language barrier for participation while maintaining the rigor of science content and processes.

The implementation of science and engineering practices demands that students work and talk with one another, sometimes in small groups, sometimes as a whole class. Classroom management strategies for students to engage in such work begin with the establishment of a classroom culture as to what is acceptable behavior. The mode of argument from evidence must be established, with norms that ensure civil discourse and respect for all speakers. Inclusion of ELLs in the discourse must be established (by example) as a part of this culture.

Further, one of the discourse conventions should be that any participant should feel free to say, "I did not understand what you said" and ask for repetition or clarification. Whether the lack of understanding is at its root linguistic or whether it depends on the conceptual clarity of what has been said, the respectful back and forth of questioning and responses will lead to the further

development of understanding of science concepts and of the language needed to discuss them.

Teachers need to recognize ELLs' varying levels of developing language proficiency and adjust norms of interaction with a student accordingly, for example, by using clearer enunciation or longer periods of wait time. They provide students with multiple redundancies of the same concepts, for example, using synonyms or paraphrases of difficult language, repeating and rephrasing main ideas, or recasting and elaborating on students' responses (Gibbons, 2006). If they have beginners in their classes, they determine which students can and cannot understand whole class explanations and they provide alternatives for those who need such alternatives. They use multiple modes of representation (gestural, oral, pictorial, graphic, and textual) to communicate meanings. They amplify rather than simplify their presentations, expressing concepts in multiple ways (van Lier & Walqui, 2010).

A student with an idea to share will want to express that idea. Often the language used to do so will not be "correct" either in the sense that the words used are not the correct technical terms, or that the grammar of the sentences is non-canonical. If these normal characteristics of emerging English are corrected, the discourse becomes stilted and the student's urge to speak is suppressed. A teacher needs to mediate such discussions to ensure that poorly-expressed ideas are being heard and considered by others, not to ensure that the students speak correctly. Asking questions to elicit amplification or clarification of an expressed idea is an effective strategy. Asking students to restate in their own words an idea just expressed by another provides chances to speak, to clarify an idea, and for the teacher to check whether other students have followed what was said. This exercise can begin with a good idea that was well expressed, or one that was poorly expressed. Either way, the repetition and ensuing discussion reinforce the idea and the language needed to talk about it. Both precision and correctness in language use develop from repeated experiences, and from models offered by the teacher in summarizing or interpreting a student's statement.

Home Language Support. It is important to draw a distinction between home language instruction (i.e., bilingual education) and home language support (Goldenberg, 2008). Even in the absence of bilingual education programs or fully-trained bilingual teachers, ELLs' home language can be used as instructional support for their learning of academic content and processes in English.

In the science classroom teachers can build upon and make use of students' home language to support science learning in English. If teachers share the same home language as their students they can use the home language to communicate and reinforce key science vocabulary and concepts (Hudicourt-Barnes, 2003). They can also allow students to communicate using combinations of their first language and English, referred to by Garcia (2009) as "translanguaging." If teachers do not speak students' home language, the home language can still be supported through a number of strategies. In the beginning of a lesson, teachers may introduce key science terminology in both the home language and English. Teachers may highlight cognates as well as false cognates between English and the home language. For example, Spanish and other Romance lexicon are often derived from Latin, the primary language of science. Bravo, Hiebert, and Pearson (2007) found that approximately 88% of key science words selected for instruction were cognates in Spanish and about half of them were high-frequency words in Spanish. Such cognates are likely to be known by Spanish speakers, even those with limited schooling in their first language.

In a bridge period for students entering with very limited English, teachers may encourage bilingual students to assist them in their home language as well as in English, allow ELLs to write about science ideas or investigations in their home language, and invite family and community members to participate as local experts in classroom literacy events. When students are asked to engage with other students in their common home language, a small group discussion is preferable to a single student "translation," which may transmit the conceptual errors of the speaker. The small group should also be asked to communicate their conclusions to others in English.

Home Culture Connections. While making connections to ELLs' home language is quite concrete, the notion of making connections to their cultural experiences in relation to academic content can be more abstract and subtle. Since science has traditionally been regarded as "culture-free," incorporation of home culture into science instruction is often ignored. Most science educators need a better understanding of how to articulate connections between home culture and school science (Lee, 2002; Warren, Ballenger, Ogonowski, Rosebery, & Hudicourt-Barnes, 2001).

The literature on cultural congruence indicates that students participate in classroom interactions in ways that reflect culturally-based communication and interaction patterns from their home and community (Gay, 2002; Villegas & Lucas, 2002). Teachers need to know how different students might be more or less familiar with the participation norms that are expected in science classrooms, what interactional patterns are common among different groups of students, and how these patterns might foster or constrain students' participation in science classrooms. Teachers must balance considerations of culturally-based patterns of communication and interaction with the risks of applying stereotypes or over-generalization based on students' cultural backgrounds. Teachers make the norms and expectations for classroom discourse explicit and look for opportunities to honor the full range of student discourse patterns when appropriate. For example, cross-talk (talking simultaneously with other speakers to add to what they are saying) is completely acceptable in some cultures, while it is considered rude and disruptive in other cultures including the cultural norms in most U.S. schools (Lee & Fradd, 1996).

The literature on funds of knowledge indicates that the lived experiences of students at home and in the community can serve as intellectual resources for academic learning (González, Moll, & Amanti, 2005; Moll, 1992). In science classrooms teachers ask questions that elicit students' funds of knowledge related to science topics (Solano-Flores & Nelson-Barber, 2001). They use cultural artifacts and community resources in ways that are academically meaningful and culturally relevant. These cultural connections can be of great assistance as ELLs strive to integrate prior experiences with new academic expectations. For example, Rodriguez and Berryman (2002) worked with high school students in predominantly Latino and impoverished school settings in a U.S.-Mexican border city. Using a curriculum unit on investigating water quality in their community, the students engaged in authentic science as they explored how this topic was socially relevant and connected to their everyday lives. Having come to see science as relevant to their lives, students saw scientific investigations as worthwhile for themselves and for students in other schools in the region.

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Language and the Common Core State Standards

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Language in the CCSS

This paper addresses the place and role of a focus on language in the Common Core State Standards (CCSS). We examine three aspects of language. First, the comments that are made specifically about language; secondly, the treatment of language as part of the English Language Arts (ELA) standards; and thirdly, the language demands that are made in other subject areas, specifically mathematics and science.

We are asking these questions because it is clear that language permeates *all* the standards, in many ways, even in those cases where the word "language" is not explicitly mentioned.

Before we address language in particular, we would like to start off with an example from mathematics, a subject that might seem to rely less on language than other subjects do. Here is an excerpt from the section on functions from the grade 8 standards for mathematics (http://www.corestandards.org/):

> Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.

What does it take for a student, *any* student, but especially an ELL, to accomplish such a task? It may be that this student understands algebraic, graphical, and numerical representations, but very likely he or she needs to listen to descriptions, discuss the functions with peers, and develop ways of expressing comparative information and results so that other students can understand them and so that the teacher is satisfied that the student understands them as well. In sum, the student has to work verbally through the problem under the guidance of the teacher and peers, and then be able to express his or her understanding through language, possibly accompanied by graphs and equations or tables of values. In all of this work, thinking and language are intimately intertwined.

This is clearly not an isolated example. Nor is it limited to mathematics, but it applies equally to all other subjects, from social studies to science and literature. Academic understandings and skills are permeated by language, both in terms of understanding concepts and accepted subject-specific procedures, and in terms of processes of learning to understand, to share, to consolidate, and to present. All of this is hard to do in your own language, the language you grew up with in your family and in your community. But it is much harder in a language that you are still in the process of developing, a long-term task for which you need steady assistance, encouragement and support. Think what would happen if you moved to China, or Turkey, and had to take an 8th grade mathematics class in Chinese or Turkish. Even if you were able to chat with your neighbors, shop in the market, and follow the soap operas on TV in Chinese or Turkish, we think you would face difficulties and stresses in your 8th grade Chinese or Turkish math class, even if you were a college-educated adult from the US.

Language Standards

The Common Core Standards address different areas of concern about language, at roughly three levels. The first level relates to the realization that language is a key contributor to the requirements of all subjects. The second area is that of the ELA standards, which specifically focus on the development of communicative and academic language skills, both within the subject area of ELA itself and across all other subject matter areas. Thirdly, those standards that focus specifically on language emphasize primarily linguistic conventions, knowledge of language, and vocabulary acquisition.

This tripartite layering of linguistic subject matter into distinct focal areas, each with its own array of language descriptors needs to be explicit, carefully interconnected, and motivated by a well-articulated curriculum detailing pedagogical approaches. A concern can be raised that the interconnections between these three areas may not always be clearly worked out or transparent. To summarize the language requirements briefly:

> 1)   The language requirements of all subjects (as exemplified above) which require cognitively- and linguistically-complex academic practices, as illustrated in the standards for science and mathematics.
>
> 2)   The skill-specific requirements as laid out in the ELA standards, which are framed in terms of the traditional four skills of speaking, listening, reading and writing, applied across the curriculum. The four-skills approach, also referred to as the separate-skills approach, has a long history in second- and foreign-language teaching. It can be traced back to early structural-situational models of teaching, in which the curriculum is broken down into discrete aspects of language (William Rutherford [1987] referred to this approach as "accumulated entities,") that are addressed in some sequential order.
>
> 3)   The requirements for explicit knowledge about language in the ELA standards. This is divided into conventions (grammar, punctuation, spelling, etc.), knowledge of language (understanding how language functions in different contexts, apply style choices, etc.), and vocabulary acquisition and use (e.g., using context to determine meaning, understanding figurative speech, using academic and domain-specific words and phrases).
> www.corestandards.org/the-standards/english-language-arts-standards*, pp. 25-30; 51-56. (Retrieved 12/20/2011)*

In general terms, when explicitly addressing ELLs, the CCSS provide the following advice:

> The National Governors Association Center for Best Practices and the Council of Chief State School Officers strongly believe that all students should be held to the same high expectations outlined in the Common Core State Standards. This includes students who are English language learners (ELLs). However, these students may require additional time, appropriate instructional support, and aligned assessments as they acquire both English language proficiency and content area knowledge.
>
> (www.corestandards.org/assets/application-for-english-learners.pdf (Retrieved 12/20/2011)

According to the above passage, CCSS refers to two aspects of concern for ELLs: *English language proficiency* and *content area knowledge*. The integration of these two aspects requires "additional time, appropriate instructional support, and aligned assignments." We feel that with this guidance as a mandate we can begin to discuss the overall role and place of language in the CCSS.

(Re)defining Language

Traditionally, language theories have been formal or functional in design. Formal theories have emphasized sentence patterns, grammatical rules, parts of speech, word formation, and so on. The study of language from this perspective has focused primarily on students' ability to use these forms correctly. As a consequence, curricular progressions are built on a sequencing of syntactic structures arranged along a continuum from what has been considered simpler to more complex, filled in with vocabulary determined useful for everyday activities. For example, courses in English as a Second Language (ESL) typically begin with the verb *be* in its simple present form, followed by present progressive, past, present perfect, future, etc. The content tends to vary from lesson to lesson, but it seldom involves students in a coherent development of deep understandings, nor creative or critical thinking. As Valdés (2009, 2010) points out, a negative outcome of this type of language understanding is the "curricularization" of ESL language courses, the idea that unless students use the language contained in the syllabus correctly, they should not pass to the next level ESL course. Studies carried out in California (Walqui, Hamburger, Koelsch, et al 2010; Linquanti, Crane & Huang, 2011) point to the devastating consequences of such a mastery approach, to its contribution to the "intermediate plateau" and to the increasing numbers of long term ELLs, students who have been classified as Limited English Proficient for seven years or more (Olsen, 2010) .

Starting in the 1970's, functional theories, in contrast, focused on meaning, or on what is done with the language. "Can I have a latte?" is first of all a request, and only in a secondary sense an interrogative structure, because the request could equally well be accomplished by "A latte, please" or "I think I'll have a latte." In language education, a functional perspective is characterized by a focus on fluency (defined as the ability to convey meanings effectively), and courses are communicative or task-based, content-based, and so on, where the focus is on the meaning that is conveyed, rather than matters of correct grammar, punctuation, spelling, and so on (known as "accuracy"). However, this functionalist approach does not lead to discursive competence, the idea that social exchange is accomplished by coherent sequences of interactions that bounce ideas back and forth in a discussion, before reaching an agreement or compromise. Because in these early functional perspectives language was seen as accomplishing discrete functions, teaching was not focused on conceptual understandings, skills, or the multiple ways of communicating emerging understandings in subject matter classes. While the functional/notional approach was as a revolutionary move at the time proposed (Wilkins, 1976), Henry Widdowson pointedly questioned whether the shift from structures to functions and notions had in fact changed anything. As he stated, "in both cases the essential design is an inventory of language units in isolation and in abstraction" (1979, p. 247). In functional/notional language learning, curricular progressions were determined by a sequencing of the most important functions to perform in a language in order to survive in an environment where the target language was used.

Also in the 1970's, the field witnessed the emergence of English for Specific Purposes (ESP, academic, professional, or occupational), and the notion of analyzing learning needs to propose curricular progressions that met the needs of the students learning the language. This latter approach has contributed significantly to the foundation of academic and professional literacies.

In practice, language courses have struggled to try and combine form and function (or accuracy and fluency) in some systematic fashion, and much of present-day discussion is focused on finding an effective – yet often elusive – fusion of form and function. Added to this, in recent years a third ingredient in the design of teaching and learning communicatively has been added: the notion of complexity (Skehan, 2009). Thus, current work on task design commonly addresses complexity-accuracy-fluency as determinants both of the appropriateness of tasks, and of the demands of tasks on learners.

It is relevant to point out though that these two approaches and their respective curricular progressions were developed for the teaching of foreign languages, that is, for situations in which the target language was not indispensable for students' participation in valued everyday societal practices.

Language as Action

A third perspective on language, and one that is currently gaining in importance, is language as *action*. It regards language as a form of human action. This view takes the functional perspective one step further. It argues that language is an inseparable part of all human action, intimately connected to all other forms of action, physical, social and symbolic. Language is thus an expression of agency, embodied and embedded in the environment. Agency can be defined as the ability to act, which is facilitated or debilitated by a range of individual and social factors, including sociocultural, historical, economic and political ones.

In a classroom context, an action-based perspective means that ELs engage in meaningful activities (projects, presentations, investigations) that engage their interest and that encourage language growth through perception, interaction, planning, research, discussion, and co-construction of academic products of various kinds. During such action-based work, language development occurs when it is carefully scaffolded by the teacher, as well as by the students working together. The goals and outcomes specify academic and linguistic criteria for success, and the road to success requires a range of focused cognitive and linguistic work, while at the same time allowing for individual and group choices and creativity (van Lier, 2007).

A good example of such action-based work is provided in Walqui & van Lier (2010), and includes a description of the work of Anthony DeFazio, who has taught course in linguistics at International High School in New York. In one such course, learners (all of them ELLs) have to write five letters about language to a person of their choice (a family member, a friend, a teacher, etc.). During a lesson described in the book, students begin drafting their first letter at their tables, individually or in pairs, while five volunteers write the first part of their letter on poster sheets, which are put up in front of the classroom. Afterwards, discussions ensue about various topics, such as whether animal communication is language or not. One of the students, Julio, vocally disagrees with one of the students who, in her letter, claims that animal communication is not a language. Later on Julio requests to read the first part of his letter, even though he was not one of the original volunteers. As he reads, he uses his body and arms to kinesically underscore what he is saying, and even interjects in his reading markers of oral communication:

> Julio: First of all I think that language is a way to inform others around you, your feelings or just a simple thing that you want to let know people what is the deal. And it can be expressed by saying it, watching a picture, or hearing it, you know what I'm saying? I don't know if you have heard about the kangaroo rat that stamps its feet to communicate with other rats. It's really funny 'cause we humans have more characteristics to

communicate to each other, but we still have problems to understand other people. Characteristics like sound, grammar, pitch and body language are some of them, while the rat only uses the foot (he stamps the ground).

Class: Excellent. (claps)

DeFazio: I never even heard about the kangaroo rat. Nice job, nice job.

Julio's letter is not 100% grammatically correct, and his reading mispronounces a number of words, but he has successfully performed a communicative action, as recognized and celebrated by his peers and teacher.

Casting language learning in such a contextualized and action-based way requires a different way of thinking about what language *is* and what it *does*. Firstly, it presupposes a view of language as action, as argued above, and in this view form and function are subservient to action. Secondly, language learning becomes usage-based rather than grammar-based (Ellis & Larsen-Freeman, 2010). Thirdly, language ceases to be an autonomous system, but is part of larger systems of meaning making; these changes have far-reaching consequences for the language curriculum, as we will detail in the next subsection.

Language Without Borders

Inside and outside of education, language is usually regarded as a subject in its own right, with its own systems and rules, and taught and learned separately from all other subjects. In reality, however, language is part and parcel of every human endeavor, whether everyday and practical, or academic and scholarly. It is impossible to draw a clear boundary between language and what is done with or talked about through language. Teaching language as if it were disconnected from the contexts in which it is used and the topics it addresses is therefore a highly artificial and ineffectual pursuit. Yet, the way the school calendar and its curricula are set up, it seems that the only way to teach language is to treat it as a separate subject, in parallel with all other subjects, whether this makes sense or not. Of course it is possible that if we didn't accord it separate and autonomous subject status, it would disappear between the cracks of the other, more easily-framed subjects.

Language is part of the rest of life and the rest of the world in many ways. First, it is embodied, that is, it is a function of the human body, part of movement, posture, expression, gesture and rhythm. Secondly, it is tightly integrated with the physical world around us, in space and time, always locating and referring to somewhere and some time, tying the word to the world, as it were. Thirdly, language is embedded in the social world of human relationships and identity. Fourthly, language represents the historical, cultural and symbolic worlds that humans create.

So far, we have talked about language as a general human mode of action and functioning, a way of making sense of the world and our place in it, and as a range of ways of doing things. We can also talk about "a language," a specific manifestation of language as used by a particular group. In this way we can identify Chinese, Arabic, English, Urdu, Hausa, and several thousand other languages. Language in this sense is identified with a specific ethnic group or a nationality. But this is of course problematic: Which Chinese? Mandarin, Cantonese, Hakka, or another variety? Which English? British? Australian? American? And so on. This brings to the fore all the old questions of standard versus non-standard, official, native, and so on. Should Spanish be taught in the US the way they speak it in Spain, or in Mexico? When teaching

French, should only Parisian French be considered, or also Quebec French? And what about Francophone Africa?

One concept that has been much debated in recent decades is the idea of "native-like." According to one collection of discussions among linguists, published in 1985, "the native speaker is dead" (Paikeday, 1985). Recent research has demonstrated that babies may be born bilingual (Kuhl, 2010; Werker & Byers-Heinlein, 2008). Are such babies native speakers of two or more languages? Many people lose the language they grew up with and can only speak the language of school or of the dominant society. The arguments around this issue are endless, but the question concerning us here is, how does this affect the issue of language standards in our multilingual, multiethnic schools? Is it feasible, realistic, and effective to adhere to a "monolingual ideology," when more and more people in the world speak English as a lingua franca, and hybrid languages are increasingly used in business, music, literature, the visual arts, etc.?

To express the growing idea that language – or a language – is not a fixed, ready-made code, but a process that is always changing and developing, a number of researchers have increasingly adopted the verb *languaging* (and the related verb *translanguaging* to indicate the use of resources across languages). It is argued that the multilingual reality of the world is not adequately served by a monolingual ideology that assumes the existence of a "native speaker," whose perfections all learners should strive to attain. The very idea of linguistic purity is brought into question (Cenoz & Gorter, 2011; Garcia, 2009; Garcia & Kleifgen, 2010).

Language Across the Curriculum

Ever since the beginning of the Language Awareness movement in the 1980s (see Svalberg, 2007; van Lier, 1995; 2001, for historical overviews), there have been calls for stressing a consistent focus on language across the curriculum, to recognize the fact that language permeates all educational and pedagogical activity. However, apart from such rather peripheral attempts as "word of the day" announcements broadcast into high school classrooms, or writing across the curriculum courses in undergraduate programs, such a language awareness curriculum has, to our knowledge, never really succeeded. The reason for the difficulty in implementing such a cross-curricular approach may at least partly lie in the existence of strongly *classified* and *framed* subject matter boundaries, as explicated in Bernstein's sociological theory of pedagogy (2000). Whether or not the CCSS can weaken entrenched boundaries and achieve more linguistic and cognitive depth across a school, and across entire school systems, is an open question.

Language as a Basis for Learning, and Some Implications

In his influential paper of 1993, Michael Halliday proposes a *language-based theory of learning*, in which he argues that all learning is mediated by language. This is similar to the role of language in Vygotsky's theory of development. Important in Vygotsky's work is the idea of interfunctionality, or the notion that human functions increasingly transform one another into higher-level interfunctional systems (Vygotsky, 1987a; 1987b).

Beginning with perceiving new sights and sounds, learning proceeds by not just perceiving, but also talking about what is perceived, and then thinking with others about what it means, and what they can do with it. Thus, perceiving, talking about perceiving, thinking about it, and acting in various ways to accomplish more and more complex tasks, all these daily activities serve to

connect perception, speech, thinking, emotion and action in multiple ways, thus achieving expertise and proficiency at ever higher levels (Gibson & Pick, 2000; van Lier, 2009).

Looking at learning from a language-based perspective requires an active learner in an action-based environment, in which challenging puzzles, explorations and projects are supported by carefully scaffolded activities and autonomy-supporting interactions (Allwright & Hanks, 2009; Deci & Flaste, 1995; Walqui & van Lier, 2010).

As noted early on in this paper, the language and subject standards are open to being interpreted in a rather narrow, accuracy-based way, or in a broad, all-encompassing way that encourages the development of cognitive, linguistic, and affective strengths in ELs, thus enabling their academic success through connecting language, subject matter knowledge, and the physical, social and symbolic worlds of the learners. The Common Core Standards provide us with an opportunity to reconceptualize our pedagogical view of language and the ways in which it can be taught. Given that learning progressions in language and subject matter content have not been empirically tested, it would make sense to explore progressions based on language as action in the education of English Language Learners. As Shavelson & Kurpius (forthcoming) remind us, "progressions are not developmentally inevitable but dependent on instruction interacting with students' prior knowledge and new-knowledge construction." The CCSS provide us with an opportunity to engage students in valuable actions, such as in English Language Arts, engaging with complex text and using evidence when interacting with others; and in Mathematics, maintaining high cognitive demand, developing beliefs that mathematics is sensible, worthwhile, and doable. A purely grammatical or functional progression will not get students to engage in these acts, or to become engaged, motivated, develop their autonomy, and succeed. It is essential that we do not miss this opportunity to integrate language, cognition, and action deeply and coherently.

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What is the Development of Literacy the Development Of?

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Research on literacy teaching and learning has often focused on the identification and support of cognitive processes and strategies in the reading of printed texts. Another line of literacy research has centered on understanding how contexts, learning environments, social interactions, cultural practices, and cultural tools inform and shape reading *and* writing – which are also conceived ever more broadly to include a range of technical platforms, modalities, and symbol systems. This work is sometimes called "the New Literacy Studies" (Gee, 1999; Street, 2003) and most recently it has been informed by research that centers on understanding the impact of digital media and the Internet on how literacy is defined and practiced (Coiro, Knobel, Lankshear, & Leu, 2009; Gee, 2004; New London Group, 1996).

"Sociocultural" studies typically refer to *practices* rather than to processes. According to Scribner and Cole (1981), in an old but durable study that shifted the conceptual vocabulary of much literacy research, a practice "consists of three components: technology, knowledge, and skills …. Whether defined in broad or narrow terms, practice always refers to socially developed and patterned ways of using technology and knowledge to accomplish tasks" (p. 236). Thus literacy practices are uses of the tools of literacy (e.g., texts, paper and pencil, digital media) in combination with the decoding and encoding processes of reading and writing (often now extended to include the processing of images and multimodal and interactive texts), informed by knowledge of genres, modalities, media, registers, styles, and grammars. It follows then from a practice approach that *literacy* can be helpfully conceived as *literacies*. Sociocultural research has documented a range of literacies across communities, societies, and institutions, including schooling, where academic language represents a specialized form of literacy and where reading and writing requirements vary according to knowledge domains and disciplines (Blommaert, Street, & Turner, 2007; Lee & Spratley, 2006; Moje, 2007, 2008a; Street, 2003). The Common Core Standards are in effect an attempt to change the kinds of literacy practices that are taught and valued in school. These Standards privilege the construction and comprehension of extended logocentric informational texts, following research that argues for the importance and prevalence of such texts in post-secondary schooling and work.

In what follows we juxtapose relevant findings from socio-cultural research on literacy to the Common Core agenda, hoping to support the successful curricular and pedagogical implementation of the standards for all students, including ELLs, and simultaneously, to broaden the conception of literacy, learning, and associated pedagogies that will constitute that implementation. In a nutshell, we will suggest how literacy, rather than only being about the development of particular kinds of print-based skills, can helpfully be conceived as participation in a range of valued meaning-making practices, and that these practices are themselves nested within particular activity structures that index desired purposes, roles, and identities (cf. Gee, 1996; Holland et al., 1998; Moje & Luke, 2009).

First, we present some background on socio-cultural perpsectives on literacy. The implications of conceiving of literacy as multiple, and as sets of practices, are actually quite far-reaching.

Practices are often taken for granted to the extent that they are almost invisible. Thus, when people's practices do not fit the norm, as is often the case for children, youth, and adults whose social, cultural, and economic circumstances diverge from the mainstream, then those practices may be deemed inappropriate or problematic, or they may be ignored (Coleman, 1990; Heath, 1983; Phillips, 1983; Sarroub, 2004). As a result, in many sociocultural studies, literacy and language are viewed as forms of "capital" (Bourdieu, 1982; Bourdieu & Wacquant, 1992) that give advantage to those who possess it. That is, power and access stem from the ability to engage in valued language and discourse practices (de Certeau, 1984; Foucault, 1980). From such a perspective it is also important to examine how those who are socially, economically, or politically more powerful typically determine the kinds of literate practices that are valued, who has access to tools and texts of power, and who is taught to become literate in the most potent ways (Cook-Gumperz, 1986; Luke, 1995). It goes without saying that the Common Core represents collective wisdom and the field's best intentions regarding what constitutes the most powerful literacy practices today. But it will also be important to keep in mind, particularly as we implement the standards, that they represent a particular version of literacy, one that is being elevated no doubt for good reasons. Yet other versions of literacy do exist, and more importantly, are being created (literacy practices and tools have never changed more rapidly than now), and will exist in sub-rosa or open competition with societal-and school-sanctioned varieties. Conversely, our goal is to insure that the powerful literacies associated with the Common Core are accessible to the full range of our student populations.

Historically, sociocultural studies of literacy have highlighted how differences in cultural practices between home and school shape students' success in learning and shape teachers' perceptions of whether and how well students can learn. These studies have helped to shift conceptions of *deficits* among learners to *differences* traceable both to cultural practices and structural inequalities. Some sociocultural research has focused heavily on the nature of the system, activity, or learning environment in which learning occurs. Such research is explicitly concerned with the social group functions and cultural norms in which human mental functioning or cognition is embedded, but also attempts to understand the leading role of particular *activities* and *activity systems* in shaping and motivating mental functioning (Chaiklin & Lave, 1996; Cole, 1996; Engeström, 1987; Wertsch, del Rio, & Alvarez, 1995). In general, the value of these perspectives is that they draw attention to how cognition is shaped by culture, context, and social interaction. One implication in terms of the Common Core is the importance of the larger implementation context for standards – at once ideological, pedagogical, and institutional.

Research conducted from a sociocultural perspective has often operated from qualitative or ethnographic data because the study of practices generally requires close examinations of invisible, taken-for-granted norms. However, mixed methods work has been conducted (see especially, Au & Mason, 1983; Lee, 1993; Palincsar & Magnusson, 2001; Scribner & Cole, 1981) to allow for the testing as well as generation of theory. To better address the efficacy of educational research, there has been a goodly amount of work done from a design research perspective. Design studies require intensive and long-term collaboration involving both researchers and practioners and are iterative, interventionist, and theory-oriented (Cobb, Confrey, diSessa, Lehrer, & Schauble, 2003). Examples of design research endeavors are well represented across the fields of literacy, mathematics, science, and technology (Hoadley, 2005; Moje et al., 2004; Steffe & Thompson, 2000), and may be a useful approach for documenting and advancing the implementation of the Common Core.

Among the key findings that derive from sociocultural perspectives on literacy are the following:

1. *Literacy learning is situated in and mediated by social and cultural interactions and tools.* This finding stems from the highly influential work of scholars such as Vygotsky (1978; 1986), Scribner and Cole (1981), Heath (1983), Street (1984), and Engeström (1987), who each demonstrated that literacy learning – and indeed, learning is general – is shaped by and shapes *(a) the cultural practices* of the group, which are often taken for granted; (b) the *social interactions* of the group in which learning occurs; (c) the *available tools* for sense-making (whether physical/material, linguistic, semiotic, discursive, or conceptual tools); (d) the particular *activities and activity systems* in which literate activity occurs; and (e) the institutions in which these activities and systems are embedded. This lists goes some distance in suggesting the complexity that lies in implementing particular versions of literacy, such as those represented in the Common Core.

2. *Literacy learning occurs via a range and blend of explicit and implicit teaching, usually guided by interaction with a more knowledgeable other over time.* Drawing on the tenets of Vygotsky (1978, 1986) and learning theorists who followed in his wake (e.g., Cole, 1996; Rogoff, 1990; Wertsch, 1991), researchers and educators have extracted pedagogical principles from basic tenets of sociocultural theories. These include constructs such as the *zone of proximal development* (Griffin & Cole, 1984; Rogoff & Wertch, 1984)*; communities of practice/learners, legitimate peripheral participation, and apprenticeship* (Lave & Wenger, 1991, 1998; Rogoff, 1993, 1995; Rogoff & Lave, 1984); *responsive teaching* (marked by teacher listening to student discourse and assessing existing knowledge in order to scaffold the development of new knowledge; cf. Schultz, 2003); and *dynamic assessment* (Lidz & Peña, 1996). It is noteworthy that few formal institutions of schooling provide opportunities to learn through a mix of implicit and explicit instruction, in communities of practice, over extended periods of time.

3. *Across the age range and from all social/cultural groups, people learn and practice literacy outside of school, often with high degrees of proficiency*. As robustly documented in sociocultural research, people engage in literate practices across multiple domains, with a range of systems, and for multiple purposes (Alvermann & Xu, 2003; Blackburn, 2005; Fisher, 2007; Heath, 1998; Hicks, 2004; Hull & Schultz, 2001; Jocson, 2008; Knobel, 1998; Leander & Lovvorn, 2007; Lewis & Fabos, 2005; Mahiri & Sablo, 1996; Moje, 2000, 2008b; Moll, 1994; Morrell & Duncan-Andrade, 2003; Noll, 1998). In fact many theoretical advances in sociocultural perspectives on literacy have come from examining literacy practices outside of schools, where certain kinds of literacy flourish and abound while literacy achievement within school is, for many youth, a continuing struggle (cf. Hull & Schultz, 2001). Moje (2000) for example documented the strong literacy skills of youth who identified as members of street gangs, but who were failing in school, in large part because they were considered unable to master conventions of literacy, but also because they were viewed as unmotivated to participate in the conventional practices of schooling. It is worth pondering that contrast, which cannot always be accounted for with reference to schooling's more complex or extensive literacy demands.

4. *To learn literacy well, students need meaningful purposes for engaging in literate practice and opportunities to use literacy for a broad range of life activities related to goals and desires beyond the moment of instruction*. Some of the most provocative research to come lately from sociocultural studies of literacy demonstrates students' deep engagement in popular cultural activities such as gaming (e.g., Martin & Steinkuehler, 2010; Steinkuehler & Johnson, 2009), some of which have quite high informational literacy demands and provide

a sophisticated motivational context for participation. (Gee, 2003) This is not to say that literacy instruction must always be based on popular cultural activities, but that a sense of the purposefulness of literacy is key for learning.

5. *Learners require, and literate ability now consists of, facility with composing, interpreting, and transforming information and knowledge across various forms of representation*. These include numeric symbols, icons, static images, moving images, oral representations, graphs, charts, and tables. It is difficult to overestimate the impact of the information revolution on the transformation of literacy practices, as suggested by the following statement from the *Handbook of Research on New Literacies* (2009), a compendium devoted to an exploration of changing literacies in our digital and global age: "No previous technology for literacy has been adopted by so many, in so many different places, in such a short period, and with such profound consequences. No previous technology for literacy permits the immediate dissemination of even newer technologies of literacy to every person on the Internet by connecting to a single link on a screen. Finally, no previous technology for literacy has provided access to so much information that is so useful, to so many people, in the history of the world. The sudden appearance of a new technology for literacy as powerful as the Internet has required us to look at the issue of new literacy with fresh lenses" (Coiro, Knobel, Lankshear, & Leu, pp. 2-3; cf. Haas & Witte, 2001; Kress, 2003).

Sociocultural perspectives on literacy have been especially concerned with issues of equity and diversity and with providing a rationale for "second chance" opportunities for learners who may struggle with or fail at school-based goals the first time around. Attention is given then to the range of ways that learners require specific literacy interventions, usually dependent on shifting contexts or the demands posed by different cultural, language, or discourse communities. A number of successful literacy learning projects, which draw broadly on sociocultural perspectives on learning, have been developed and implemented in K-12 or afterschool/out-of-school time settings, all with the goal of developing powerful literacy practices and/or bridging from out-of-school to school-based literacies. They provide examples of the purposes, participant structures, and conceptions of literacy in which Common Core standards could be embedded. The threads running through them are these: building upon learners' existing knowledge and cultural practices; demystifying academic language and literacy; and situating literacy learning within a larger motivating activity and/or purpose.

a. *Funds of Knowledge.* This work illustrated the effectiveness of drawing explicit and substantive connections between familial and community resources – "historically accumulated and culturally developed bodies of knowledge and skills" (Moll, Amanti, Neff, & Gonzalez, 2004, pp. 72-73) – and classroom curricula and activities. (Moll, 1994; Moll, Veléz-Ibañéz, & Greenberg, 1989; Moll & Whitmore, 1993).

b. *Kamehameha Project*. This project demonstrated improved literacy learning among Hawaiian children when Hawaiian "talk story" practices were integrated into reading instruction (Au, 1998; Au & Kawakami, 1994; Au & Mason, 1983).

c. *Third Space*. Literacy research that seeks to build "third spaces" rests on teachers' facilities for hearing, seeing, and incorporating children and youths' literacy and language practices into academic literacy and language instruction in an attempt to build connections from home to school discourses. Ethnographic studies demonstrate the capacities of able teachers and the learning of their students (Gutierrez, 2008; Gutiérrez, Baquedano-López, Alvarez, & Chiu, 1999; Gutiérrez,

Rymes, & Larson, 1995; Moje, Ciechanowski, et al., 2004; Moje, Collazo, Carrillo, & Marx, 2001).

d. *Critical Academic Literacies*. Similar to third space research, critical academic literacies engage youth in community and social action projects that teach history, sociology, anthropology, urban studies, and academic literacy skills. Morrell and colleagues have experienced success with these projects as evidenced by the college-going rates of their participants (Collatos et al., 2004; Morrell, 2002, 2004; Morrell & Collatos, 2003).

e. *Cultural Modeling*. Like the prior projects, Lee has developed interventions that employ home, community, and cultural discourse and literacy practices of youth as a tool for teaching conventional academic literacy practices, particularly in English language arts. Results of a mixed methods study demonstrated that youth learned to navigate high school English texts while also learning the main tools of conventional literacy criticism, in large part because these tools were already a part of their home discourses (Lee, 1993, 1995, 2001, 2007).

f. *Inquiry/Project-Based.* These projects develop science, mathematics, and historical studies around driving or essential questions and engage students in real-world inquiry to develop answers to these questions. Numerous studies have demonstrated gains in student content learning as measured by conventional assessments (Blumenfeld, Marx, & Harris, 2006; Blumenfeld, Marx, Krajcik, Fishman, & Soloway, 2000; Cobb & Bowers, 1999; Fradd, Lee, Sutman, & Saxton, 2001; Geier, et al., in press; O. Lee, 1999; O. Lee & Fradd, 1998; Moje, Peek-Brown, et al., 2004). Less is known about the impact on students' literacy learning when literacy teaching is embedded in content projects but initial studies are promising (Bain, 2006; Moje et al., 2004; Gomez, Gomez, Kwon, & Sherrer, in press).

g. *Disciplinary Literacy*. This kind of instruction seeks to make explicit the different reading and writing demands and conventions of the disciplinary domains, acknowledging that the disciplines are social constructions with particular ways of knowing and discourses/linguistic conventions used to represent those ways (Bain, 2007; Hynd-Shanahan, Holschuh, & Hubbard, 2004; Moje, 2007, 2008a; Schleppegrell, 2004; Shanahan & Shanahan, 2008).

h. *Youth Media*. There is a long tradition through community-based and after-school programs or providing media-intensive and arts-based instruction, especially for marginalized youth, but in recent years the numbers of such programs have increased dramatically (e.g., Buckingham, 2003; Eccles & Gootman, 2002; Halverson, in press; Hull & colleagues, 2006; Ito & Colleagues, 2009; Soep & Chavez, 2005). Often drawing on popular cultural forms including music, film, and digital media, they develop literacy-related skills and practices by immersing participants in language-rich and multimodal activities. Sometimes framed as providing alternative educational spaces where youth who are alienated from school can find re-entry points to re-enage with learning, most such programs do not measure success via academic literacy gains. However, research that has compared students who participate in these programs with non-affiliated youth has suggested superior academic and social performance (Heath, 1998). It would be interesting to consider how out-of-school and extra-school programs could become spaces for

implementing media-intensive projects that serve to implement Common
Core standards.

As implementation of the Common Core proceeds, the process will assuredly be accompanied by myriad concerns. In the particular case of the standards for English Language Arts, changes in what counts as a valued literacy practice can be expected to evoke strong opinions. Nevermind that literacy practices have already shifted in our information and technology-saturated age, and that those shifts are in fact providing a ring-side seat for viewing the varied responses to the Common Core – at least for those with access to the tools of the Internet, the skills to negotiate its specialized reading and writing contexts, and the knowledge and disposition to participate in public blogging. In an recent article published on the website for the Core Knowledge Foundation (http://www.coreknowledge.org), a nonprofit founded by E.D. Hirsch, himself a prominent participant in debates about what constitutes literacy, one commentator summarized and lamented accounts of the piloting of the standards in New York City schools. A 10th grade English teacher asked her students to watch a filmed stage performance of *Death of a Saleman*, starring Dustin Hoffman as Willy Loman, before they read the text of the play. The teacher said she offered this assignment as a way to challenge students to "experience a classic in a different way" (Pondiscio, 2011) and saw it as a modification of her usual lesson plans that was in line with the goals of Common Core. The commentator "blanched" at this choice.

However what was most interesting were the comments posted by the readers of the blog. The first defended the teacher, pointing out that Arthur Miller wrote his play for the stage and that it therefore should be watched instead of read – but noted that there would indeed be a problem should the teacher ask her students to watch a stage adaptation of a novel prior to reading the book. Another worried that the film would implant images, preventing students from imagining characters on their own. A third found it silly that the teacher would be attacked for making her lesson entertaining and, presumably therefore easy, and confided that he as a "person and student" worked hardest on things that entertained him. Another was convinced that the teacher's assignment didn't actually follow from the Common Core, and what's more, he suspected that the teacher's previous assignments hadn't adhered to the New York State standards either. And on and on. The commentaries illustrate how fervently we hold and closely we guard our own particular values and practices about print, literature, and pedagogy. We hope this paper has also suggested nonetheless that we are in the midst of a sea change in terms of how literacy is practiced in the world, and that a part of the implementation of the Common Core will be to help teachers successfully negotiate those changes in the context of standards (not to mention financial retrenchment). We hope it has also given a sense of how literacy practices derive their vitality from curricula and activities that connect to learners' backgrounds, cultures, and communities; that capitalize on the social nature of learning; and that position young people to experience literacy as purposeful and themselves as skillful and confident makers
of meaning.

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What Does Text Complexity Mean for English Learners and Language Minority Students?

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Text Complexity and Academic Language

We begin with questions that educators throughout the U.S. should be asking. What will the more demanding complex texts implied by the Common Core State Standards (CCSS) mean for those students who are already having trouble with existing standards? This group includes English learners (ELs), and also the language minority students (LMs)[i] who speak English only, but not the variety that is valued and promoted in the society's schools. What will the CCSS mean for the educators who work with these students? The students are unaware of what the changes in standards will mean for them, but teachers are not, and they are worried. How can they be expected to help their students handle materials that are more demanding than what already seems difficult enough?

This worry is justified. A glance at current efforts to map the CCSS onto curriculum, or at the design of sample units, suggests that there is little understanding in our community of the role played by language in the process of attaining literacy. Where any attention is given to language at all, the focus is on vocabulary, and that at the level of individual words.

We will argue that the problems English learners and language minority students are experiencing stem at least partly from educators' failure to recognize the role played by language itself in literacy. Given the language diversity in our schools and in our classrooms, any effort to make the CCSS attainable for these and many other students must go beyond vocabulary, and should begin with an examination of our beliefs about language, literacy and learning.

In ways that appear to be little understood, even by literacy experts, the language used in complex texts of the type students should be reading in school is different in numerous ways from the language of ordinary talk. Differences in vocabulary, the easiest to see, make up only a part of it. Linguists and language analysts[ii] who have studied the language of academic texts have identified *grammatical structures and devices* for framing ideas, indicating relationships, and structuring arguments, that create *substantial differences between spoken and written language*.

The language used in complex texts differs enough from the English familiar to most students that it constitutes a barrier to understanding when they first encounter it in the texts they read in school. This becomes critical in the fourth grade and beyond when the texts children read take

on a different pedagogical function. Texts through the third grade are meant to teach children how to read, so they are composed using simple sentence patterns, decodable words and selected high-frequency words that are meant to be learned by sight, and they are accompanied by pictures that support an understanding of what the texts are about. Since the texts have minimal responsibility in bearing the meaning, they tend to lack the richness, depth and complexity found later.

From the fourth grade on, however, the texts themselves have a new purpose: children are supposed to have completed the process of "learning to read," and are ready to begin "reading to learn," as the saying goes. Reading becomes a means for learning subject matter, and texts at that point become pedagogical tools: they convey information to be read, studied and learned in such school subjects as literature, science, social studies and math. Given these new functions, texts cannot remain simple for long. To communicate complex ideas and information calls for the lexical and grammatical resources of mature discourse – students must master these if they are to succeed in school and career.

How do children learn such language? Ordinarily, language learning happens when learners come into close and frequent contact with speakers of the target language, and efforts are made both by the learners and target language speakers to communicate by use of that language. But interactional opportunities with speakers are seldom if ever available for the learning of *academic* language. It is highly unlikely that students, even "mainstream" English speakers, will find conversation partners who are inclined to interact with them in such language. In fact, very little of the language spoken by teachers in the classroom, even during explicit instruction, qualifies as instances of this register, as one discovers by studying transcripts of instructional events in classrooms.[iii] To further complicate matters, we would argue that academic language cannot be "taught" as a separate school subject, either, at least not in the way one might teach a language like English, Spanish or French. So where and how are students to learn this kind of language?

There is only one way to acquire the language of literacy, and that is through literacy itself. Why? Because the only place students are likely to encounter these structures and patterns is in the materials they read. And that is possible only if the texts they read in school are written in such language. Complex texts provide school-age learners reliable access to this language, and interacting with such texts allows them to discover how academic language works.

Herein lies a major problem for English learners and language minority students. One of the biggest roadblocks to learning is that they never get a chance to work with complex texts. Why would that be a problem? Simply put, the easy texts schools give to ELs and LMs – given prophylactically as a safeguard against failure – actually prevent them from discovering how language works in academic discourse. Simplified texts offer no clue as to what academic language sounds like or how it works. We will comment on the kind of help ELs and LMs need in order to work with complex texts, after we take a look at some samples of the language of academic discourse to see what it involves.

Powerfully Complex Texts: An Exemplar

So what are the linguistic characteristics of academic texts? An answer can be found by looking at the texts listed in the CCSS documents as exemplars of what students should be reading in grades 4-5 and above. (Exemplars can be found in grades K-3 texts, but mostly in those listed as read-alouds.) As we would expect from the CCSS's "staircase of complexity," examples of 'complex' texts can most readily be found in materials listed for grades 6-8 and above. Consider, for example, Martin Luther King's *Letter from Birmingham Jail* (hereafter, *Letter*) included as a reading for Grades 9-10. It is demanding and complex, both linguistically and in its historical and philosophical content.

The Letter does not have abstruse vocabulary or complicated grammar when compared to more specialized discourse or to stylistic tendencies of an earlier era.[iv] Yet its linguistic demands are substantial. The study of any part of this text would result in a fairly comprehensive inventory of the basic communicative and grammatical characteristics of academic discourse. In what follows, we'll use small pieces of this text to explicate what ELs and LMs and their teachers face more generally.

A quick look at the *Letter*'s first two paragraphs reveals some key features of such writing. In these paragraphs, King responds to the charge in the white clergymen's published statement[v] that the black community's demonstrations were "unwise and untimely," and were "led and directed by outsiders."

WHILE confined here in the Birmingham city jail, I came across your recent statement calling our present activities "unwise and untimely." Seldom, if ever, do I pause to answer criticism of my work and ideas. If I sought to answer all of the criticisms that cross my desk, my secretaries would be engaged in little else in the course of the day, and I would have no time for constructive work. But since I feel that you are men of genuine good will and your criticisms are sincerely set forth, I would like to answer your statement in what I hope will be patient and reasonable terms.

I think I should give the reason for my being in Birmingham, since you have been influenced by the argument of "outsiders coming in." I have the honor of serving as president of the Southern Christian Leadership Conference, an organization operating in every Southern state, with headquarters in Atlanta, Georgia. We have some eighty-five affiliate organizations all across the South, one being the Alabama Christian Movement for Human Rights. Whenever necessary and possible, we share staff, educational and financial resources with our affiliates. Several months ago our local affiliate here in Birmingham invited us to be on call to engage in a nonviolent direct-action program if such were deemed necessary. We readily consented, and when the hour came we lived up to our promises. So I am here, along with several members of my staff, because we were invited here. I am here because I have basic organizational ties here.

Beyond this, I am in Birmingham because injustice is here…[1]

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[1] Full text of this letter can be found at <http://mlk-kpp01.stanford.edu/index.php/resources/article/annotated_letter_from_birmingham/#birmingham>

These paragraphs illustrate a hallmark of academic writing: ***informational density***. Virtually every phrase and clause tells a story, or provides a crucial piece of information regarding the circumstances leading to King's being in Birmingham. The informational load is in fact even greater than the sum of the individual parts because there are phrases that carry layered messages. The first paragraph begins with an adverbial clause which ostensibly reveals nothing more than where King was when he "came across" the clergymen's statement – *"While confined here in the Birmingham city jail…".* The subtext is a rebuke – He could not have just come across the statement while flipping through the newspaper; he was locked up, his freedom curtailed. But it was also a rebuttal to the suggestion that "honest and open negotiation" was even possible in a situation where a man could be jailed for exercising his constitutional right to free speech.

The second sentence, beginning with a fronted two-part negative time adverbial requiring an auxiliary verb before the subject ("seldom, if ever, do I pause to answer criticism of my work"), implies that writing such a letter would ordinarily be seen as an interruption of work that should not be interrupted; under the circumstances, he has time to respond. The third sentence is a counterfactual conditional sentence explaining why this is usually impossible: "If I sought to answer all the criticisms" [which I do not], important work would not get done. The fourth sentence begins with a long subordinate clause that assumes (or pretends to assume) good will and sincerity on the part of the critics, and continues with an expression that includes what is functionally a kind of parenthetical ("I would like to answer your statement in <u>what I hope will be</u> patient and reasonable terms").

The second paragraph takes on the charge that MLK is an intruding outsider, someone who doesn't belong in their community. He explains that he has legitimate reasons for being in Birmingham, and that his organization has affiliates throughout the southern states, and he ends this paragraph, and begins the next one, with several repetitions of "here" and "because": I am *here because* we were invited here, I am *here because* I have organizational ties here, I am in Birmingham *because* injustice is *here*.

A closer look at some of the phrases and clauses in these paragraphs reveals a frequently exploited grammatical device for packing information into texts: ***heavy noun phrases***, phrases headed by nouns (NPs), which are modified or expanded by phrases and clauses before (pre-nominally) and after (post-nominally) the head noun itself. The grammar of English allows multiple pre- and post-modifiers to be packed into NPs, all of which adds information to the meaning of the <u>head noun</u> itself. Here in bracketed notation are two such heavy NPs, with the head nouns underlined (preposition phrases are labeled, PP; relative clause constructions by RC):

NP[your recent <u>statement</u> RC[calling our present activities "unwise and untimely"]].

NP[some eighty-five <u>affiliate organizations</u> PP[all over the South], RC[one being the Alabama Christian Movement for Human Rights.]]

Elaboration of nouns is extremely frequent in informational and expository prose (60% of nouns are so elaborated), but is relatively rare in spoken language (15%, by one account).[vi] Pre-nominal modifiers (quantifiers and adjective phrases) are used slightly more often than post-nominal modifiers (prepositional phrases and relative clause constructions). This kind of text includes instances of NPs where *both* pre- and post-nominal modifiers appear as in the two examples above.[vii] These are very rare in spoken language.

The next sentence, "*It is easy for those who have never felt the stinging darts of segregation to say 'Wait' "*, introduces a metaphor – "the stinging darts of segregation." It is followed by a 310-word sentence that begins with the word, *But*. What follows is a cascade of *when*-clauses, piling up reasons for understanding why King – and any sensible person – would find it difficult to wait. The signers of the newspaper statement, all white, are being asked to imagine themselves sharing the experiences of black Americans, and then to imagine their willingness to be patient. In the display below, the individual clauses are truncated to make it easy to see the whole. (The full sentence is in Appendix A.)

> But
> > when you have seen …
> > when you have seen …
> > when you see …
> > when you suddenly find …
> > when you have to concoct …
> > when you take a cross-country drive and find …
> > when you are humiliated …
> > when your first name becomes …
> > when you are harried …
> > when you go forever fighting …
> then you will understand why we find it difficult to wait.

Within this litany are phrases that emphasize the unending nature of the suffering: *night after night, day in and day out, harried by day and haunted by night, never knowing what to expect, forever fighting*.

This sentence deserves to be examined phrase by phrase, but it is also important for the reader to appreciate the cadence of the list of grievances, followed by the conclusion, *THEN you will understand*. Readers who have gone through the Declaration of Independence will see a similarity between the two documents, but King's list is one that asks the bishops and rabbis to imagine seeing the things Black people have seen, having the experiences they have had; in Thomas Jefferson's case, it is a list of intolerable acts by the British king: *He has plundered our seas, ravaged our coasts, burnt our towns, and destroyed the life of our people*.

A Strategic Approach: Looking Closely at Language in One Sentence at a Time

Could English learners and language minority students handle the complexity of the *Letter*? It would be a demanding text for any student, but especially for ELs and LMs. Could they handle it? Not on their own – as David Coleman has argued, it is a text that demands close and thoughtful reading and discussion.[viii] We would add that the language demands are such that many students, but especially English learners, need instructional support from teachers to discover how to gain access to the ideas, concepts, and information that are encoded in the text. Note that we do not say that students need to learn the grammatical and linguistic terms we use in explicating the examples above. Rather, they need to learn how to *gain access to the ideas* encoded in this complex language.

Over the past 5 years, one of us (LWF) has worked with educators in several cities (New York City, Denver, and Beaverton, OR) to develop a method for providing K-12 students with the instructional support they need to get such access, and to enable them to learn how language works in complex texts. It begins with close readings of complex texts related to topics in science and social studies in elementary and middle school, and in history and English literature in high school. The work began as a strategy for restarting the stalled efforts of English learners in NYC who were having trouble moving beyond intermediate-level English proficiency. At the heart of the strategy (which had many components) was a daily instructional session in which teachers led students in a discussion focused on *a single sentence* drawn from the text the class was working on.

The goal of these conversations was to help students learn to unpack the information so tightly packed into academic texts, and in so doing, gradually internalize an awareness of the relation between specific linguistic patterns and the functions they serve in texts. It begins with the selection of a sentence for each day's conversation, the best being one that is so complex it begs for explication, is grammatically interesting, and is focused on an important point in the passage.

Examining One Sentence Closely...

After the *Letter* had been published, King tacked on a kind of preamble for further publications of it, explaining what he describes as the "somewhat constricted circumstance" under which it was written.[ix] Let's consider how this sentence could be used: *"Begun on the margins of the newspaper in which the statement appeared while I was in jail, the letter was continued on scraps of writing paper supplied by a friendly Negro trusty, and concluded on a pad my attorneys were eventually permitted to leave me."* An examination of this sentence shows three different "clauses" and the way in which they are organized into a complex sentence. The subject of the sentence is *the letter*, and the three clauses all express, in passive voice, facts about the letter's creation: how it was *begun*, *continued*, and *concluded*. Superficially this sentence informs the reader about the paper on which the letter was written– what could be

more trivial? – but when we see the details it becomes clear why we think the description *under somewhat constricting circumstance* was a staggering understatement.

Each of the verbs *begun*, *continued*, and *concluded* is followed by the preposition *on* and a description of the writing paper and how he had access to it. We can see how elaborations of the NPs add further specifications of what is being identified by imagining a dialogue suggested by the bracketed questions in the right column (and which could usefully serve as conversational starters in an instructional conversation that begins to delve into this sentence):

Begun	
on the margins	[THE MARGINS OF WHAT?]
of the newspaper	[WHAT NEWSPAPER?]
in which the statement appeared	[WHEN WAS THAT?]
while I was in jail,	
the letter	
was	
continued	
on scraps	[SCRAPS OF WHAT?]
of writing paper	[WHERE DID THAT COME FROM?]
supplied	[BY WHOM?]
by a friendly Negro trusty,	
and	
concluded	
on a pad	[WHERE DID HE GET THAT?]
my attorneys	
were eventually permitted to leave me.	[WHO PERMITTED THEM TO LEAVE IT FOR HIM?]

There is a lot of material here to support a classroom conversation about why King's situation was more than a *somewhat constricting circumstance*. King was allowed to see a copy of the newspaper in which his fellow clergymen urged him to slow down, but he had to use the blank spaces in the paper to start his letter; a fellow prisoner brought him scraps of writing paper to continue; and his attorneys were *eventually permitted* to give him a writing pad. That phrase alone gives readers a sense of the kind of world it is, one in which being in jail means you are denied even paper to write on.

The phrases and words as arrayed above provide a clear canvas for teachers to bring students' attention to structure, and the way it carries meaning in complex texts like this one. For example, each verb in the sentence above is followed by a phrase starting with the preposition *on,* a phrase that describes the paper King used to write and rewrite his Letter. Each phrase ends with a modifier – each a different example of a grammatical structure that is central to academic writing: the *relative clause*.   The first one (*the newspaper in which the statement appeared*), contains a relative pronoun, *which*. The second one (*scraps of paper supplied by a friendly Negro trusty*) is sometimes called a "reduced relative" because it is missing the relative pronoun *which* and an auxiliary verb (*scraps of paper* (which were) *supplied by*...). The third is

a so-called "bare relative", because it is missing the relative pronoun *which*.[x]

Some might see these details as beside the point: why waste time with discussions of traditional grammar? Our experience tells us that these labels can give EL and LM students a sense of purchase on the complexity that confronts them, and that they relish the naming and the details of the important constructions. Consider, for example, fourth graders at a Queens elementary school on parent visiting night,[xi] eagerly showing their parents "relative clauses" in sentences posted on the board, based on their discussions of "juicy sentences" with such structures through the year.

The instructional conversations focus on sentences drawn, each day, from the part of the text the class is working on. These conversations require planning and thought. Preparation begins with a close examination of the focal sentence by the teacher, not necessarily in the linguistic detail shown above, but phrase by phrase to identify the information conveyed in each. Conversational starters, ideally in the form of open-ended questions or prompts, rather than ones seeking specific answers as in our analysis, are drawn up to get the discussion started. For example:

- *MLK comments that his Letter had been written under "a somewhat constricting circumstance." What does this sentence tell us about that circumstance?*

- *Can we tell from this sentence how the clergymen's statement affected MLK when he first read it?*

- *Which part of the sentence tells us that? Explain why you think that.*

Questions Going Forward:

Is there any evidence that this approach works? How much time should these conversations take? Are students willing participants? Does it have any effect?

We have not had time to conduct formal research on the effectiveness of the approach, but teachers and administrators in the participating schools are convinced that the approach works, enough so that they have decided to use it for all students, and not just for ELs and LMs. That decision was prompted, not only by the increased numbers of ELs passing New York's English language proficiency test, but by ELs actually outperforming non-EL students in the ELA test that is given each year at lab sites, and by increased percentages of students passing the Regent's Global History test after teachers at our high school lab sites began working on language in their classes.

But how can 15 to 20 minutes spent discussing the language in just one sentence each day have such a great effect? That's hardly enough time to make any difference at all, one might argue. And yet, it did. After participating in these instructional events for a time, the students behave as if they have been let in on a big secret – how to make sense of things that did not

make much sense before. That doesn't mean they have mastered the intricacies of academic language yet, but knowing that they need to notice how language is used in text is the first step. We are sufficiently convinced, in large part by the success we have seen in schools, to recommend the approach to other educators who are trying to find ways to make the CCSS work for all students, including English learners and language minorities. This will require a focus on professional development to support teachers' work with the structures in powerful texts, but that's another paper.

Excerpt from Martin Luther King, Jr. Letter from Birmingham Jail

"…We have waited for more than 340 years for our constitutional and God-given rights. The nations of Asia and Africa are moving with jetlike speed toward gaining political independence, but we still creep at horse-and-buggy pace toward gaining a cup of coffee at a lunch counter. Perhaps it is easy for those who have never felt the stinging darts of segregation to say, 'Wait.' But when you have seen vicious mobs lynch your mothers and fathers at will and drown your sisters and brothers at whim; when you have seen hate-filled policemen curse, kick and even kill your black brothers and sisters; when you see the vast majority of your twenty million Negro brothers smothering in an airtight cage of poverty in the midst of an affluent society; when you suddenly find your tongue twisted and your speech stammering as you seek to explain to your six-year-old daughter why she can't go to the public amusement park that has just been advertised on television, and see tears welling up in her eyes when she is told that Funtown is closed to colored children, and see ominous clouds of inferiority beginning to form in her little mental sky, and see her beginning to distort her personality by developing an unconscious bitterness toward white people; when you have to concoct an answer for a five-year-old son who is asking: 'Daddy, why do white people treat colored people so mean?'; when you take a cross-country drive and find it necessary to sleep night after night in the uncomfortable corners of your automobile because no motel will accept you; when you are humiliated day in and day out by nagging signs reading 'white' and 'colored'; when your first name becomes 'nigger,' your middle name becomes 'boy' (however old you are) and your last name becomes 'John,' and your wife and mother are never given the respected title 'Mrs.'; when you are harried by day and haunted by night by the fact that you are a Negro, living constantly at tiptoe stance, never quite knowing what to expect next, and are plagued with inner fears and outer resentments; when you go forever fighting a degenerating sense of 'nobodiness'–then you will understand why we find it difficult to wait. There comes a time when the cup of endurance runs over, and men are no longer willing to be plunged into the abyss of despair. I hope, sirs, you can understand our legitimate and unavoidable impatience."

Retrieved from The Martin Luther King, Jr. Research and Education Institute Web Site, 13 December 2011. <http://mlk-kpp01.stanford.edu/index.php/resources/article/annotated_letter_from_birmingham/#birmingham>

ENDNOTES

[i] The students we are referring to as language minorities include American Indian, Alaskan natives, Latino students, and African Americans, who come from homes or communities where heritage languages are spoken, but the students themselves speak only English. Their English, however, is different enough from the standard variety on which academic discourse is based, to require instructional help getting access to the language of complex texts. The tendency in our schools when these students have literacy problems has been to see them as stemming from deficiencies in vocabulary and skills.

[ii] See especially:

Biber, D., Johansson, S., Leech, G., Conrad, S., & Finnegan, E. (1999). *Longman Grammar of Spoken and Written English.* Pearson Education Limited.

Chafe, W., & Tannen, D. (1987). The relation between written and spoken language. *Annual Review of Anthropology, 16*, 383-407.

Flower, L. (1990). The role of task representation in Reading-to-Write. In L. Flower, V. Stein, J. Ackerman & M. Kantz (Eds.), *Reading-to-Write: Exploring a Cognitive and Social Process* (35-74). Oxford and New York: Oxford University Press.

Halliday, M. A. K. (1993). Toward a language-based theory of learning. *Linguistics and Education, 5* (2), 93-116.

Schleppergrel, M. (2004). *The Language of Schooling: A Functional Linguistics Perspective.* Routledge.

[iii] See, for example, transcripts of TIMSS science lessons which can be accessed online at the (http://timssvideo.com/)

[iv] If an example of what we mean would be useful, try this, from H. D. Thoreau's *On Walden Pond:* "*The ancient philosophers, Chinese, Hindoo, Persian, and Greek, were a class than which none has been poorer in outward riches, nor so rich in inward.*" Or this, from P. B. Shelley: "*That the frequency of a belief in God (for it is not universal) should be any argument in its favor, none to whom the unnumerable mistakes of men are familiar, will assert*" (from *A Refutation of Deism,* 1814*).*

[v] Statement by Alabama Clergymen, 12 April 1963. Retrieved from Stanford University Website, November 10, 2011. http://www.stanford.edu/group/King//frequentdocs/clergy.pdf

[vi] Biber, et al. (1999. *LGSWE* (578). Note: What we are calling informational and expository corresponds to what is described in *LGSWE* as academic prose & news writing.

[vii] There are many other grammatical means by which information can be packed into sentences, but in the interest of space, we have had to limit ourselves to a discussion of NPs. We would like to have discussed how the use of adverbial phrases and clauses tacked onto the main clause in sentences add information concerning the circumstances, reasoning behind, or the writer's stance on what is communicated by the main clause. The forms they can take (adverbs, preposition phrases, clauses), and the many places they can be inserted (preceding and following the main clause, and at virtually every interstice of phrases and clauses) make them the most varied and ubiquitous structures in this kind of written language.

[viii] **"Bringing the Common Core to Life"** April 28, 2011 webinar.
http://usny.nysed.gov/rttt/resources/bringing-the-common-core-to-life.html

[ix] This was added to the Letter after its initial publication: "*AUTHOR'S NOTE: This response to a published statement by eight fellow clergymen from Alabama (Bishop C. C. J. Carpenter, Bishop Joseph A. Durick, Rabbi Hilton L. Grafman, Bishop Paul Hardin, Bishop Holan B. Harmon, the Reverend George M. Murray, the Reverend Edward V. Ramage and the Reverend Earl Stallings) was composed under somewhat constricting circumstance. Begun on the margins of the newspaper in which the statement appeared while I was in jail, the letter was continued on scraps of writing paper supplied by a friendly Negro trusty, and concluded on a pad my attorneys were eventually permitted to leave me. Although the text remains in substance unaltered, I have indulged in the author's prerogative of polishing it for publication." (http://abacus.bates.edu/admin/offices/dos/mlk/letter.html; retrieved 12/31/11)

[x] Notice that both of the last two relative clauses contain passives. A sentence like this one should be remembered when a young writer receives advice about avoiding passive sentences at all costs.

[xi] P.S. Q-002. The school had been involved in this work on academic language development for ELs less than a year when this observation was reported. Teacher of the fourth grade class, Ms. Olga Dourmas.

Issues and Opportunities in Improving the Quality of Large Scale Assessment Systems for English Language Learners

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Large-scale academic content assessments primarily developed for and field tested on native speakers of English and those proficient in academic English may not produce reliable and valid outcomes for English Learner (ELL) students due to several extraneous factors. Key among these factors are ELL students' current level of English language proficiency (ELP); the unnecessary linguistic complexity of assessment items relative to the construct(s) being measured; and the validity of accommodations provided to improve accessibility of content-based assessments for ELLs. Next-generation assessment systems aligned to Common Core State Standards (CCSS) currently being developed by the two multistate Race-To-the-Top assessment consortia must engage these challenges and develop assessment systems that are accessible to ELLs.

This paper briefly summarizes some fundamental concepts in assessing ELLs, reviews issues that threaten the validity of interpretation of academic content assessments for ELL students, and provides recommendations on how to address such threats. It also highlights ELL-relevant assessment innovations on the horizon, and briefly discusses their promise and potential pitfalls. Finally, it suggests ways to strengthen connections between the academic assessment system development work of the PARCC and SBAC assessment consortia, and the work of next-generation ELP assessment developers and consortia, all with an eye to building a more coherent overall assessment system
for ELLs.

Fundamental Considerations

Unlike all other subgroup memberships for students, English Learner as a status is meant to be *temporary*, and ELLs are expected to leave the category as a result of effective, specialized language instruction and academic support services that they are legally required to receive.[i] ELL status is operationalized typically using both linguistic and academic performance standards, so the most linguistically and academically accomplished students exit the ELL category over time, while those not making sufficient progress remain and are joined by newly-entering ELLs, who are by definition at low ELP levels (Kim-Wolf et al., 2008; National Research Council, 2011; Working Group on ELL Policy, 2010). While assessment and accountability systems usually treat the ELL category as binary (a student is ELL or not), ELLs are very diverse and exhibit a wide range of language and academic competencies, both in English and their primary language (Capps et al., 2005; Taylor, Stecher, O'Day, Naftel, & LeFlock, 2010).

An ELL's ELP level clearly affects her ability to learn academic content in English and to demonstrate academic knowledge and skills on assessment events carried out in English. For most English Learners to learn academic English skills they need to effectively handle grade-level content demands, it takes 4 to 7 years depending upon several factors including their initial English language proficiency, age/grade on entry, and prior educational experiences (Cook,

Linquanti, Chinen & Jung, 2012; Hakuta, Butler, & Witt, 2000; Linquanti and George, 2007). Therefore academic assessments that fail to take account of ELLs' English language proficiency will likely inadequately measure their content area knowledge and skills.[ii] If an ELL student performs poorly on a content assessment, educators and policymakers need to better understand whether this is due to: 1) insufficient English language proficiency to demonstrate content knowledge; 2) a lack of content knowledge or opportunity to learn content; 3) construct-irrelevant interference (e.g., unnecessarily complex language in the assessment); or 4) other sources of bias or error (e.g., cultural distance, rater misinterpretation).

Language Demands of CCSS and the Role of Comprehensive Assessment Systems

The CCSS specify to an unprecedented degree the kinds of academic language competencies that students need in order to perform content area tasks and demonstrate subject matter mastery. In addition to explicitly defining K-12 listening, speaking, reading, and writing standards in English Language Arts (ELA), the CCSS in ELA also define literacy standards for history/social studies, science, and technical subjects at the secondary level. Across these different content areas and including mathematics, all students will now be expected to engage with more complex texts and to carry out more language-rich tasks (e.g., obtaining information, demonstrating understanding, constructing explanations, engaging in arguments, etc.) in discipline-appropriate ways during both learning and assessment situations.

As states adopt and implement the CCSS, many are also collaborating in ELP assessment consortia to revise their existing ELP standards to better correspond to the academic language demands reflected in the CCSS. The greater language-explicitness of the CCSS creates opportunities to better signal both general and discipline-specific academic language uses that all teachers need to foster and all students master within given content areas (Wong-Fillmore and Snow, 2002). Indeed, language is integral to these next-generation content standards and some content standards may need to be assessed in part by measuring such language uses within the content assessment. Nevertheless, assessment developers still need to carefully distinguish what language is content-related (construct-relevant) in order to ensure that language that is unrelated to the focal construct (construct-irrelevant) is not confounded with the content being measured.

The comprehensive systems of both assessment consortia (SBAC and PARCC) need to strike a judicious balance among the three key dimensions of assessment: *summative assessments* of cognitively complex knowledge and behaviors for program review and accountability purposes; *interim benchmark assessments* at key intervals during the school year to predict outcomes and guide interventions; and *formative assessment* practices, processes and tools to directly inform, support, and enhance teacher pedagogy and student learning. While assessment developers usually focus the least attention and resources on the last of these, this form of assessment (*for* and *as* learning) is critically important to get right for ELLs because it is the most *instructionally relevant*. Indeed, formative assessment processes, when seen within a teaching and learning paradigm (versus a measurement paradigm), can be used productively by teachers with *all* students (Heritage, 2010). The inequitable distribution of instructional resources to appropriately support ELLs' learning and the substantial need for better preparation, coaching, and ongoing professional development of all teachers of ELLs, make it all the more important to develop ELL-relevant formative assessment processes and practices that can provide feedback and

guide next steps in teaching and learning for linguistic and academic growth (Gandara, Rumberger, Maxwell-Jolly, & Callahan, 2003; Taylor et al., 2010).[iii]

Formative assessment tools and practices can also be particularly useful in measuring progress in ELL students' academic English development. As suggested above, ELL students who are instructed and assessed in English need to advance toward a level of proficiency in English that allows them to increasingly participate in academic activities using English. Formative assessment outcomes, or other interim assessments of students' English proficiency used formatively, can also help teachers make more informed decisions about their ELL students' degree of readiness to participate in assessment events delivered in English, and about what accommodations may be appropriate to facilitate participation (see below).

A key concern about interim/benchmark assessments meriting note – especially if these are used summatively – involves the language demands that correspond to particular content and the timing of interim assessments measuring such content. Since ELLs' language competencies develop throughout the school year, differential opportunities to learn and demonstrate subject matter knowledge may occur *within* the school year.[iv] In particular, the outcomes of interim assessments administered earlier in the academic year may unfairly represent ELL student results if the language competencies needed to display such academic knowledge are targeted and learned later in the school year. It is therefore critical to determine key target language uses corresponding to the curricular material to be taught, and to ensure that ELLs receive language instruction that addresses these target uses in the time period covered by the interim academic assessment. This implies the need for careful articulation of language instruction and content instruction goals.

Issues in Assessing College and Career Readiness

Another issue challenging next-generation assessments is the conceptualization and measurement of "college and career readiness." While the CCSS's goal of identifying and fostering skills needed for success in college and career is laudable, creating tests to measure such skills poses serious content and psychometric challenges. Under current practice, college entrance examinations such as the SAT and ACT are often used as external validity criteria for predicting students' success in college from their academic performance in high school. Yet such assessments suffer from the same construct-irrelevant language complexity (discussed below) that clearly threatens their validity in predicting ELLs' college and career readiness. Unless such issues are systematically addressed through careful attention to the language used in new academic consortia assessments, biases against ELLs in the interpretation of their college and career readiness will likely be perpetuated.

The Impact of Construct-Irrelevant Factors on Assessment Outcomes for ELL Students

Assessment content and questions should address only the focal construct, or the construct the assessment claims to measure. However, many factors unrelated to the focal construct impact assessment outcomes. Some factors are considered random measurement error (e.g., error due to inconsistencies in scoring open-ended questions).[v] Other extraneous variables *systematically* affect measurement outcomes and their effects cannot be removed from assessment outcomes even with unlimited repeated measurements. Linguistic complexity that is

unrelated to the focal construct represents such an unnecessary, "construct-irrelevant" source of systematic measurement error and may seriously affect ELL measurement outcomes.[vi]

Research has clearly demonstrated the impact of language factors on the assessment of ELL students both on Title I and Title III assessments (Kopriva, 2008; Solano-Flores, 2006). Language that is unrelated, unnecessary, or irrelevant to the construct can cause ELLs difficulty in understanding and responding to assessment questions. Examples of language difficulty include unfamiliar vocabulary, complex grammatical structures, nominalization, multiple embedded clauses, and passive voice constructions. In reading/language arts and ELP assessments, language is so inherent to the focal construct that the concept of unnecessary linguistic complexity may not apply. (Even in these areas, excessive linguistic complexity can still be avoided.) However, in mathematics and science, test items may have complex linguistic structures unrelated to the focal construct that unnecessarily add to cognitive load and slow the reader down (Abedi, Lord, & Plummer, 1997; Abedi, 2006; Abedi, et al (in press); Kopriva, 2008; Shaftel, Belton-Kocher, Glasnapp, & Poggio, 2006; Solano-Flores, 2006).

Distinguishing Language that is Relevant and Irrelevant to the Focal Construct: A Simple Example

Distinguishing language that is related versus unrelated to the construct poses serious challenges and requires both content and language experts to carefully develop and review test items and tasks and to determine such distinctions. Even in content areas that are not commonly understood as language-heavy in assessment events (e.g., mathematics and science), language plays an essential role both to set the context and to define the content. Based on this premise, decisions are made (explicitly or implicitly) about what language is necessary in assessing content and how to help students understand the content knowledge and skills being elicited, versus what language is irrelevant and causes the student unjustified burden and confusion.

In a study on the impact of language factors on the assessment of ELL students, Abedi and Lord (2001) compared the performance of Grade 8 students who received an original NAEP mathematics version of the test items with the performance of those students who received a linguistically-revised version of the items. The authors found significant improvements on the performance of ELL students taking the mathematics test version which was linguistically modified to reduce the level of unnecessary linguistic complexity. The revised version was prepared by a team of experts in such a way as to not alter or modify any content-related language. Before administration of the two test forms, two mathematics content experts independently compared the original and the linguistically modified versions to make sure the math content was not altered. Subsequent studies (e.g., Abedi, 2006) have confirmed these findings and suggest that reducing unnecessary linguistic complexity improves the validity of content-based assessments for ELL students.

To illustrate the process of linguistic modification that addresses language irrelevant to the focal construct, we present a grade 4 released mathematics test item prompt in its original form and a linguistically-revised form, and then elaborate on what linguistic modifications were conducted on the item.[1]

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[1] Retrieved from the California Department of Education website at http://www.cde.ca.gov/ta/tg/sr/documents/cstrtqmath4.pdf. The authors thank Nancy Ewers for providing this example.

Original Prompt: A <u>cookie factory</u> <u>can bake</u> 62 trays of cookies in the morning and 53 trays of cookies in the afternoon. <u>If each tray holds 12 cookies,</u> how many cookies <u>can be baked</u> in 1 day?

Revised Prompt with reduced linguistic complexity: A bakery bakes 62 trays of bread in the morning and 53 trays in the afternoon. Each tray holds 12 loaves of bread. How many loaves did they bake in one day?

The linguistic complexity is reduced by making the following changes:

1. Replace *cookie factory* with the accurate word for such a facility, *bakery.*
2. Replace *cookies* with the more cross-culturally familiar word *bread.*
3. Replace the modal verb phrase *can bake* with simple present tense.
4. Replace the subordinate clause *if each tray holds 12 cookies*, with a simple declarative sentence.
5. Eliminate the modal with passive voice *can be baked* with a past tense interrogative sentence.

A comparison of the linguistic structure of the two versions of this item reveals that the modifications target unnecessary linguistic complexity and do not alter any language related to the content. This makes the reduced linguistic complexity math item potentially more accessible to ELL students.

Leveraging Accommodations for Incremental Improvement: What Have We Learned?

Federal law requires that ELLs be provided with accommodations to make assessments more accessible to them. However, accommodations used by ELLs must be *effective* in improving accessibility and must also be *valid* (demonstrate an absence of advantage for non-ELLs). Decisions on the number and type of accommodations to be used with ELLs are left to each state (Kieffer, Lesaux, Rivera & Francis, 2009; Shafer Willner, Rivera & Acosta, 2008; Solano-Flores, 2006; Young et al., 2008).[vii]

Among the most important criteria for selecting appropriate accommodations for ELL students is relevance to specific need. Unlike students with disabilities with different needs, ELLs share a common need for assistance with the language of assessments. Research evidence supports the value of accommodations offering direct and indirect linguistic support *when appropriately tailored to ELL characteristics and testing conditions* (Pennock-Roman & Rivera, 2011; Shafer Willner et al., 2008). For example, English customized dictionaries/ glossaries that clarify key vocabulary not directly tied to the construct being measured are effective in paper-and-pencil versions when ELLs are given extra time. Pop-up English glossaries (via computer-based delivery) are more helpful under restricted time constraints. Students instructed bilingually may need to be accommodated based on their ELP level as well as on the goals of instructional program. For example, primary-language (L1) versions of test items are promising for L1 speakers at low-ELP levels and those being instructed in L1 while learning English. This accommodation is less effective for ELLs at intermediate ELP levels and those receiving content

instruction in English. Dual-language formats (parallel bilingual versions and bilingual glossaries) also show promise if there are generous time limits to help students with differing capacities in both languages. Finally, plain-English accommodations, though promising, have yielded mixed results with effectiveness, though not with validity when used in rigorous experimental research designs (Duran, 2008; Kieffer et al., 2009).[viii] Since the CCSS calls forth many academic language skills that are inextricably related to more complex content knowledge and are central to many focal constructs, such necessary language complexity may be ineligible for simplification.

Clearly, not all accommodations are appropriate for all ELLs since ELLs are heterogeneous in ways that can measurably influence the effectiveness of particular accommodations. Using a decision algorithm to assign configurations of accommodations tailored to ELLs' linguistic and socio-cultural characteristics shows promise in yielding better performance outcomes than providing all available accommodations or no accommodations (Kopriva, Emick, Hipolito-Delgado & Cameron, 2007). While such an algorithm depends on the capacity of states and districts to collect relevant data at the student level, new data systems coming online in states and districts may soon make this a
feasible option.

Computer Adaptive Tests, Automated Scoring, & Language-Minimizing Accommodations

Several innovations on the horizon hold promise for improving the assessment system's responsiveness to ELLs but these must be pursued carefully. *Computer adaptive testing*, or online testing formats presenting students with test questions of a level of difficulty continually adjusted based on how the student has answered previous questions, may more accurately estimate ELLs' content knowledge while also increasing testing efficiency and reducing stigma and demoralization (see Reckase, 2011). In order for CAT to work for ELLs, the optimization algorithms that assign test items must be sensitive to an ELL's ELP level (particularly in literacy domains) so that items of equivalent construct difficulty, but with differing levels of linguistic complexity, can be assigned to ELLs of different ELP levels. Given that both consortia are expected to develop tens of thousands of items, it will be crucial to categorize the language demands inherent in test items and tasks by ELP performance level descriptors, even if such benchmarking and anchoring must be done in terms broad enough to be comparable across different ELP assessments (e.g., beginning, intermediate, advanced). Likewise, *automated scoring routines* that enable computerized scoring of short essays and constructed responses may need to be specially programmed to recognize common "trans-language" features of ELL writing. This would require training such artificial intelligence engines with exemplars that include grammatical, vocabulary, and discourse features of ELLs at various stages of second language acquisition, in order to provide a more careful analysis and meaningful judgment of performance by ELP level.

Finally, substantial work is being done using online formats that increase access by conveying information to and receiving information from ELLs at the lowest ELP levels (Kopriva, 2011). Multi-semiotic approaches in particular appear promising in accessing conceptual and procedural knowledge in science and math of ELLs at the lowest ELP levels.[ix] Such methods can provide more accurate and valid information on these ELLs and also signal to educators that ELLs at all stages of language development can learn and be assessed in the academic content. However, these "language-minimizing" accommodations must be understood and

utilized as temporary strategies to measure students' knowledge while students develop language competencies required by CCSS. If not, such efforts could unintentionally suggest to teachers that ELLs' language development is not essential to learning and demonstrating academic content knowledge, and contribute to their instructional marginalization.

Implications for Moving Forward

As the nation implements more rigorous, language-rich academic content standards in English language arts, mathematics, and science and moves towards more comprehensive academic and ELP assessment systems, educators and assessment developers have a clear opportunity and obligation to ensure that the growing ELL student population has meaningful access to rigorous instruction and valid, useful assessments to measure language and content knowledge, skills, and abilities.

There have been intriguing suggestions that, just as ELL students reaching a "threshold" level of English language proficiency must be effectively supported in developing their interpersonal, presentational, and interpretive uses of language by content area teachers (Walqui & Heritage, 2012), so too such discipline-specific social and academic language competencies delineated in next-generation standards might be called out, measured and reported for *all students* – English learners, standard English learners, and monolingual standard English speakers – *as part of* the Race To the Top academic content assessments. While it would respond to a steadily growing call to operationalize and measure academic language uses for all students, this approach also raises several significant challenges. These include ensuring the validity of the language competencies postulated within the content standards as integral to demonstrating mastery of subject matter content; avoiding unnecessary linguistic complexity in assessing necessary linguistic competencies; and aligning the assessment infrastructure to clearly and coherently articulate where the "threshold" is crossed from ESL/ELD precursor language progressions to language constructs found in the content standards. (See Bailey & Wolf [2012] for further discussion of ELP standards.)

Given the demonstrated impact of English language proficiency on ELLs' opportunity to learn and on their assessment outcomes, states and consortia first need to develop a coherent framework to ensure that the breadth, depth, and complexity of academic language uses reflected in CCSS are adequately captured in new ELP standards. Academic assessment consortia and ELP assessment developers should also strengthen communication, data collection and analysis, experimentation, and prototyping of ELP and academic assessment tasks to yield more aligned and coherent information across assessment systems. They can also invest heavily in formative assessment processes and practices, tools and tasks that carefully map key academic language competencies and target language uses, and ensure these language competencies are articulated in language learning progressions reflected in ELP standards and ELP assessment specifications. Moreover, academic assessment developers can use these ELP performance standards to evaluate the language demands of different content assessment items and tasks, which will be critical in the adaptive assignment of the tens of thousands of test items to ELLs of different ELP levels.

The PARCC and SBAC assessment consortia can also incorporate lessons from research on ELL assessment and accommodations into their test development processes. For example, they can: 1) Examine different interpretations of test scores by subgroups of students, including ELLs at different ELP levels, to identify possible threats to valid interpretation of assessment

outcomes; 2) Identify possible construct-irrelevant sources in assessment items and tasks by conducting cognitive labs and think-aloud procedures on ELLs at different ELP levels; 3) Have content, language, and assessment experts identify unnecessary linguistic complexity; 4) Distinguish linguistic structures that are related and unrelated to the focal construct; even construct-relevant language can be made more accessible for ELLs by, for example, avoiding long and complex reading comprehension passages when such complexities are not required by CCSS standards being measured; 5) Specify accommodations for ELLs based on student characteristics, testing conditions, and instructional services provided; avoiding accommodations that are ineffective or irrelevant for ELLs, or that alter the focal construct; and 6) Provide evidence to substantiate selection and delivery of accommodations for ELLs.

The two academic assessment consortia have access to the insights of rigorous, current research on ELL academic assessment. They also have colleagues working in parallel on next-generation ELP standards and assessments articulating the language demands of CCSS. Where gaps in knowledge exist, enormous opportunities also exist to collaboratively prototype, field test, study, and advance understanding of ELL-responsive assessment tasks and strategies. Such resources and opportunities can and must inform the development of next-generation assessment systems that are more accessible, valid, and useful to ELLs.

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[i] English learners are language minority students not sufficiently proficient in English to be able to benefit adequately from regular mainstream instruction and demonstrate their knowledge and abilities using English.

[ii] Note that issues of measurement are distinct from issues of accountability. From a measurement perspective, knowing an ELL's ELP level (particularly with respect to literacy) is essential to judging the validity of the inferences from the assessment. With respect to educator accountability however, there may still be a rationale for including such results to determine school or district effectiveness, particularly if ELLs have not been supported to progress in their English-language proficiency over time (see Cook et al., 2012).

[iii] ELL-focused formative approaches are slowly evolving and include pilot academic content learning progressions and associated language learning targets; prototyped performance tasks and instructional supports linked to those tasks; and professional development models that systematically build teachers' capacities to evaluate ELLs' access to and accomplishment of language and content objectives that indicate progress toward larger instructional goals. See FLARE; WestEd's Quality Teaching for English Learners Program; Bailey & Heritage, 2010; Heritage, 2008.

[iv] See Wise (2011) for discussion of issues related to different aggregation methods of interim/benchmark assessment results.

[v] Random measurement error affects the observed score (X) but its impact reduces by averaging over repeated observation. The observed score (X) becomes closer to the true score (T) as the number of measurements increases. In classical test theory (Thorndike, 2005), the correlation between the true score and error score is assumed to be zero. For example, in scoring open-ended questions, some judges might be lenient and provide higher scores for everyone whereas some other raters may be less generous in their rating and assign lower ratings to everyone. Averaging over a number of ratings from the two groups of raters should control for this source of measurement error. Accordingly, in a generalizability approach (Shavelson & Webb, 1991), the number of levels within each facet of measurement is increased in order to reduce measurement error and improve score dependability.

[vi] Test items that are culturally biased may also pose difficulty for test takers with different cultural backgrounds. Such difficulties could systematically distort the assessment outcomes and reduce students' test scores significantly.

[vii] For a more elaborated summary of this and the following section, see Linquanti (2011).

[viii] Possible explanations include heightened sensitivity of test developers in recent years to avoid unnecessarily linguistically-complex items, which may reduce gains produced by plain-English versions; and the presence of comparison groups of non-ELLs that include former ELLs with ongoing linguistic needs who also benefit from the accommodation, which may affect comparison statistics.

[ix] See www.onpar.us for examples of this strategy.

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The Challenge of Assessing Language Proficiency *Aligned* to the Common Core State Standards and Some Possible Solutions

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For the past decade, there has been a significant change in assessing the English language proficiency (ELP) of English language learners (ELLs). Since the accountability reform efforts of the No Child Left Behind Act (NCLB, 2001), an emphasis has been placed on measuring the kind of language proficiency students presumably need in order to succeed in academic contexts. Title III of NCLB first made the suggestion that the ELP standards that are adopted by each state be "linked" – in an unspecified fashion – to the states' academic content standards, and that the states' ELP assessments be aligned to their respective ELP standards. This mandate has been interpreted by many states as calling for a link between ELP standards and English language arts (ELA) standards. Yet, as state ELA standards are varied in their breadth, depth, and emphasis of content, varied ELP standards have been formulated. A general consensus has emerged that ELP assessments should measure students' academic language proficiency in order to gauge the accessibility of content instruction for ELL students. However, varied ELP standards and definitions of the language proficiency construct represent a major challenge for developing and validating the current generation of ELP assessments (e.g., Wolf, Farnsworth, & Herman, 2008).

We see both promise and new challenges in the assessment of ELP with the advent of the national movement toward Common Core State Standards (CCSS) in Mathematics, ELA and Literacy in History/Social Studies, Science, and Technical Subjects and the Next Generation Science Standards from Achieve Inc. based on the recent framework developed by the National Research Council (2011). Now that we have a common set of core content standards across most states, one potential benefit is that we can focus on identifying and measuring the linguistic knowledge and skills that students will need in order to meet the CCSS, potentially simplifying and streamlining the development of ELP assessments. Another promising aspect is that the CCSS specify the literacy skills in grades 6-12 expected for the content areas, including social studies and science, which are also mapped to skills delineated in the ELA standards. That is, the CCSS attempt to establish common language skills across the different content areas. In doing so the CCSS offer language test developers the benefits of target expectations from which to create measures of ELP needed to acquire content (and demonstrate learning) expressed in the CCSS. However, the CCSS also pose challenges for future ELP assessment. The twin goals of this paper are to discuss the significant challenges of assessing ELP in ways that are aligned to the content of the CCSS, and to offer practical suggestions for the development of next generation ELP assessments that take account of the CCSS.

Some Challenges

We organize the challenges in the development and alignment of ELP assessment to the CCSS around three sets of related issues: (1) identifying language knowledge and skills in the CCSS, (2) defining alignment in the context of ELP assessments, and (3) articulating a new ELP

standards framework that can guide states in their development of next generation ELP standards and assessments.

1. Identifying language knowledge and skills: The following example is taken from Reading Standards for Literacy in History/Social Studies, Grades 11-12.

> *4. Determine the meaning of words and phrases as they are used in a text, including analyzing how an author uses and refines the meaning of a key term over the course of a text (e.g., how Madison defines faction in Federalist No. 10).*

The standard (and parallel standards at earlier grades and in the ELA Standards) overtly mentions what kinds of tasks students must be able to accomplish with language as they read and, in this instance, attempt to comprehend history texts. Expectations for vocabulary knowledge and analysis skill will likely be measured on future content assessments and would be obvious targets for ELP assessment. Let us take another example, this time from Reading Standards for ELA Informational Text, Grades 11-12.

> *7. Integrate and evaluate multiple sources of information presented in different formats and media (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem.*

Despite being a reading standard, Standard 7 (and parallel standards at earlier grades and for Literacy in History/Social Studies, Science and Technical Subjects) does not overtly mention specific reading skills. In fact, this standard entails the integrated language skills of reading, writing, speaking, and listening. It is also notable that more than one task and skill is implied in one single standard.

These examples from the CCSS demonstrate the complexities of assessing ELP in a way that is aligned to the CCSS. Even if Standard 4 above overtly delineates language skill expectations (and many standards do not, as in Standard 7), it presupposes a whole host of other language skills and knowledge that are not overtly acknowledged. For instance, to demonstrate the skills covered in this standard, students must be able to use the conventions of providing formal definitions, they must be able to talk or write about word choice and semantic refinement as objects of study, and they must understand and use the language of sequencing in order to keep track of word usage across the text. Standard 7, which rather implicitly embeds a wide range of language skills, requires a thorough identification of all the language skills involved.

Considering that the CCSS by their nature describe the expected end-goals at each grade level, identifying underlying or relevant language skills is a challenging but critical step to take for teaching and assessing ELL students. For ELL students, we need to specify the entirety of other language skills that will also be needed to meet the standards. Then, the role of ELP assessments is to measure the extent to which ELL students are able to meet the language demands of the standards in order to identify where they are in their language learning and what they need instructionally to move their learning forward. Indeed, to use a quote attributed to Winston Churchill, we are facing "*a riddle wrapped in a mystery inside an enigma.*" Nevertheless, characterizing the inherent language demands of the CCSS will be at the heart of attempts to support instructional practices and align ELP assessments to the standards. Here, we acknowledge that many students who are acquiring two or more languages simultaneously may also be receiving content instruction in two languages. Bilingual education programming will have its own set of issues concerning both the CCSS and assessment implications of the new standards, and these also deserve a full treatment by the education research community.

Such issues may include assessment in and of the two languages in order to present a more accurate profile of a student. However, these issues are outside the scope of the current paper which was tasked with the examination of ELP assessment relative to the CCSS (see the paper by Brisk & Proctor (2012), for a discussion on the CCSS in bilingual programs).

2. Defining "alignment": Use of the term "alignment" to describe the quality of the connection between content standards and language assessments differs from that of more traditional notions of alignment between standards and assessments in the field of education. Most often, previous alignment efforts have sought to describe relationships between the content represented in subject matter standards statements and the content coverage provided by test items of the same subject matter (e.g., Webb, 1997). Alignment has also been conducted between content standards and alternative standards or assessments – but again *within* the same content area (e.g., WestEd, 2004). It has been claimed that strong alignment between standards and assessments will help ensure accurate and meaningful measures of student achievement and instructional effectiveness (e.g., Fast & Hebbler, 2004; Herman, 2004; Webb, 1997).

Following NCLB, attempts have been made to judge the degree of linkage between ELP standards and the different sets of academic standards (including ELA as a content area distinct from ELP). For example, the implicit or explicit language demands (at lexical, syntactic, and discourse levels) found to be common to both ELP standards and academic content standards can provide one such mechanism for determining linkage on a linguistic dimension also useful for instruction with ELL students (Bailey, Butler & Sato, 2005/7). Cook (2007) took a similar approach by attempting to link the content of ELP standards and the linguistic *registers* of academic content standards. He operationalized alignment in this context as both linkage (the match between standards), as well as correspondence in terms of depth of knowledge and breadth of coverage. However, the scope of these different attempts has been limited because existing state academic content standards do not overtly mention the language associated with their aspirations for mathematics, ELA, science and social studies. More recently, Chi, Garcia*,* Surber, and Trautman (2011) applied Cook's approach to their studies of alignment between the CCSS and the content of the Model Performance Indictors in the 2007 WIDA ELP standards, in which it appears sufficient details in the CCSS allowed for reliable judgments of alignment to be made at most grade levels. However, this focus does not appear to attempt to link the different standards at the level of discrete linguistic features that could also be useful information for ELL instruction and ELP test development. It is also noteworthy that prior efforts have attempted to link ELP standards to academic content standards, and to align ELP assessments to ELP standards, rather than to attempt to establish some manner of alignment between ELP assessments and academic content standards directly.

Attempting to directly align ELP assessments to the CCSS without an intervening set of ELP standards may not be suitable. On the one hand, the CCSS have been written with close attention to the language demands inherent in the content areas. This should make the likelihood of aligning ELP assessments directly to the CCSS more achievable. On the other hand, a set of standards for ELP related to the CCSS is advisable for guiding both instruction and future assessment development (e.g., to avoid undesirable content drift in assessment items).

3. Articulating a new ELP standards framework: As briefly mentioned, existing ELP standards developed or adopted by states are widely varied in terms of the content and expectations at different levels of proficiency. The lack of a common framework to develop and organize ELP standards linked to academic content standards imposes significant challenges

on creating ELP assessments that are useful for ELL students' learning and instruction. It has also raised significant concern about the comparability and fairness of accountability drawn from the assessment results across states and even within states. Different ways of operationalizing the construct of academic language have surfaced in the current generation of ELP assessments. For example, some states' ELP assessments have operationalized the academic language construct by deriving it directly from the ELA standards. The WIDA consortium's ELP assessments attempt to encompass the academic language encountered in ELA, mathematics, science, and social studies. There are also other ELP assessments measuring more general language proficiency across content areas.

The majority of states have elected to adopt the CCSS with augmentation from their own content standards. These states now need to incorporate the language skills delineated or embedded in the CCSS into their ELP standards. While we acknowledge that the concept of alignment itself for ELP assessments has yet to be clarified, establishing a framework for the creation of ELP standards aligned with the CCSS is an area of pressing need. Such a framework can be construed as a set of principles and approaches to guide the formulation of ELP standards.[1] The framework can also guide states throughout their decision-making in the adoption of ELP standards and aligned assessments.

In terms of principles for the development of an ELP standards framework, we propose that:

1. The formulation of an ELP framework attend to its systematic uses across curriculum, instruction, and assessment;

2. The ELP construct be articulated with a view to language as a social practice and action to enhance meaningful language learning for students (see the paper by van Lier & Walqui (2012) for discussion on this topic);

3. The ELP construct be elaborated in ways that can help teachers and students to understand general and specific language demands associated with various school tasks across content areas;

4. Content and language be acknowledged as largely intertwined to help understand the link between ELP and content standards including the CCSS;

5. Macro- and micro-level of details of expected proficiency be delineated at each proficiency level;

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[1] The necessity for ELP standards has been questioned. Their quality and usability have been critiqued in the educational field (e.g., Bailey & Huang, 2011), and teachers may simply not consult them. Outright elimination of ELP standards, however, requires that both ESL and content teachers can and will be sufficiently prepared to be able to extract the necessary language skills and knowledge from ELA standards and other content area standards on their own. Teachers will no longer have the option of consulting a document (albeit considered flawed in some current forms) describing expectations for language development and that can serve as guides to the kinds of learning that should occur on route to proficiency in the English language. Without such documents to rely on, the education profession has the opportunity to respond – indeed will likely be impelled to respond – with alternate forms of support for teachers attempting to meet the linguistic needs of ELLs.

6. Clear language be used to describe the expected performance, avoiding vague words and phrases that may be interpreted in different ways.

To execute these principles, new models to help define content and language dimensions for the purpose of instruction, curriculum, and assessment may be created. These principles will also help us understand the unique role of ELP standards and differentiate ELP standards from ELA standards. Although there would be natural overlap between ELP and ELA standards, ELP standards formulated under these principles would contain foundational language skills as well as more complex language skills that are required across multiple content areas in addition to ELA content. An explicit articulation of different levels of proficiency in ELP standards also plays an important role in establishing developmental progressions to guide teaching and student learning.

We identify at least two different approaches regarding the creation of next generation ELP standards:

1. Creation of new standards for all levels of ELP. This approach is a continuation of the current practice, but following the principles outlined above could lead to improvement of the ELP standards. The improved ELP standards should build closer ties to instruction and curriculum of different content areas and articulate the ELP construct to reduce redundancies with ELA standards. This approach assumes a parallel development of language proficiency and content, highlighting a distinctive ELP construct underlying the language demands across all content areas.

2. Creation of standards up to a threshold level of ELP only. This approach acknowledges the need for ELP standards to delineate foundational and basic language functions and skills up to a certain level of proficiency in English. That is, standards can be created that identify precursor skills for achieving the skills articulated in the CCSS or other content standards. Beyond that threshold the language skills students need for successful achievement on the CCSS may overlap sufficiently with the language skills in the CCSS for acquiring and expressing content learning that these may be indistinguishable from the CCSS (although one challenge will be to determine an adequate ELP threshold). Moreover, at upper levels of ELP, language and academic content may be intertwined and difficult to meaningfully assess as separate constructs (see also the paper by Abedi & Linquanti (2012) for a discussion of assessing the content learning of ELL students). As the CCSS explicitly articulate language and literacy skills across content areas, these skills may need to be assessed for all students as part of academic content assessments. Rather than a separate ELP assessment for the upper levels of proficiency, the education field should consider developing and piloting novel options of assessing language related to the CCSS within the new academic achievement assessments (e.g., the Race To The Top consortia assessments). In doing so, it is crucial for the combined expertise of ESL and content teachers to be utilized to develop and implement local-level performance and formative assessments of language and content knowledge during authentic content instruction, activities and practices. This approach highlights the notion that ELL students' English language proficiency must be developed in conjunction with content learning in content classes.

In the next section, we make suggestions for addressing the challenges discussed above and the reality of advancing toward next generation ELP assessments.

Suggestions for Next Generation ELP Assessments

The ultimate goal of assessing ELL students' English language proficiency is to gauge the extent to which they have acquired the necessary language skills to access content learning. By doing so, assessments should provide meaningful information about the link between content learning and language proficiency to support academic achievement. The purpose of current ELP assessments has been to measure annual growth and ultimate attainment, information used summatively for accountability purposes under Title III. While NCLB made a significant impact on paying special attention to ELL students' English language proficiency and the assessment of their proficiency levels and language development, the emphasis on accountability assessment has been criticized for lack of connection to and support for instruction and student learning. For next generation ELP assessments aligned to the CCSS, it is time to consider the purposes of assessment more widely, not only for accountability but for meaningful feedback to teachers and students. We look first at assessment purpose and use and then at determining language constructs to be aligned to the CCSS.

1. Assessment purpose and use: A single assessment cannot serve multiple purposes unless it is deliberately designed to do so. As the purpose of any test drives its design, including the definition of the construct to be measured, the articulation of the intended use of the test is the first and foremost consideration. Under an overarching construct of English language proficiency necessary to meet the academic content standards (e.g., the CCSS), more concrete and operationalized constructs can be defined for ELP assessments serving different purposes. Coverage of the overarching construct may differ for macro-and micro-level assessments (Black, Wilson, & Yao, 2011). Measurement-driven or macro-level assessments are familiar to us as those most often used summatively for large-scale accountability purposes and for covering broad intervals of learning (e.g., a school year). The strengths of these assessments include such factors as economy of scale, uniformity (i.e., standardized administration procedures and scoring), and consistency (i.e., normed for comparison over time/across test-takers). Their weaknesses can include omission of certain important features of the ELP construct (e.g., dialogic interactions, although creative item development using digital technology should ameliorate this), assumed homogeneity of test-takers that raises issues of fairness and bias if assumptions are violated with ELL students, and a high level of assessment literacy required by teachers to interpret test scores.

Performance data-driven or micro-level assessments can also play a role in next generation ELP assessment in providing formative feedback to inform teaching and learning on a continuing basis. This approach to assessment can capture authentic uses of language in the classroom and can account for the local context (small-scale) but can also archive and collate student performances for summative purposes. Weaknesses in this approach include the difficulty of establishing standardization and validity, issues of fairness and bias, and demands on teacher assessment literacy for both implementation of assessments and interpretation of assessment results.

2. Determining the language construct(s) to be aligned to the CCSS: Few may realize that when facing his enigma (Russia at the start of World War II), Churchill went on to say, "but perhaps there is a key." The key to unlocking the enigma that is alignment in this context may involve the adoption and integration of more than one notion of what it means to align an assessment to standards. This includes establishing relationships between standards and assessments and between sets of standards on an abstract dimension such as language demands in addition to content and cognitive demands. Discrete linguistic and discourse

features (both explicit and implicit) in the CCSS might be identified and organized, drawing on existing language competence models. This can serve as a base to define the construct of ELP assessments. A systematic correspondence among language, content, and cognitive demands should then be examined between ELP assessments and the kinds of tasks or activities that the CCSS express. This might be comparable to "connections" to the CCSS, the approach adopted by the WIDA Consortium 2012 draft standards for ELP. Scenarios suggested by the CCSS might serve as model instantiations of the language students will likely encounter in the classroom during different content tasks.

For example, to meet CCSS Reading Standard 7 given above, some language demands include understanding a given question, comprehending the content of multiple oral and written materials, comparing and contrasting the information in the materials, integrating the information in a similar or different theme, and evaluating the relevance of the information to the question. Depending on the topic of the question and materials, knowledge of domain-specific linguistic features (e.g., technical vocabulary, certain grammatical structures) may also be needed. Some of the language skills may overlap with those in other standards. Once an array of language demands and skills is identified, the next step is to organize those skills holistically and systematically at a higher level. This organization can also help in the creation of a core ELP construct or an ELP standards framework. If ELP assessments are built employing this mechanism, alignment to the CCSS may be inherently incorporated into the assessments.

The ELP construct can be further specified by proficiency levels within grade or grade span. These should describe the extent to which students are able to listen, speak, read and write within each standard or, at minimum, key or recurring standards. Specifically, language acquisition theory and empirical evidence of language learning progressions can be used to articulate the four modalities, capturing the subskills or prerequisite skills that delineate proficiency levels (including any skills not articulated in the CCSS). These can serve to organize ELP associated with the CCSS for both instructional and all assessment purposes. Moreover, specific language skills for content areas may also need to be assessed, and the results will need to be available to content area teachers (and, in the case of performance data-driven approaches, content area teachers can be encouraged to adopt these as part of instructional practice).

Implications

We have discussed possible ways to develop next generation ELP assessments aligned to the CCSS. This unique opportunity has a number of implications for policy makers, practitioners, and test developers. New ELP assessments will be used in state and district classification systems for ELLs and will play a role in establishing a "common definition" of ELL. The efforts of developing ELP assessments in alignment with the CCSS could lead to greater ELP data use by both content and ESL teachers; state agencies should establish a system to link content and ELP test data for ease of sharing by content and ESL teachers, which in turn may lead to changes in the instructional strategies and linguistic pedagogies of all teachers. Furthermore, what and how teachers teach is influenced by assessment (i.e., washback effects) (Cheng, 2008). We need to guard against washback that could lead to negative impacts on teaching by carefully defining the ELP construct to be measured. One risk is to de-emphasize the standards that require inter- and intra-personal uses of language necessary for successful engagement in school but are not readily assessable on a traditional large-scale assessment. Another is to ignore entirely the language used during social (i.e., non-scholastic) experiences that is necessary for becoming fully functional in English across all aspects of a student's life. We

should consider ways in which these diverse interactions can also be systematically included in ELP assessment. Finally, teachers will need professional development support in the area of assessment literacy to take advantage of this new opportunity for broadening and improving ELL assessment practices.

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Instruction for Diverse Groups of English Language Learners

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English Language Learners (ELLs), who constitute the most rapidly growing segment of the student population in American schools, are an immensely diverse group. Among the variables that account for the diversity are place of birth, developmental differences, language exposure, parental education, community attitudes, socioeconomic status, time in the United States, experience of formal schooling, immigration status, and ethnic heritage (e.g., Bailey, Heritage & Bulter, forthcoming; Butler and Stevens, 1997; Walqui, 2000). Because of the diversity of ELLs, there is not a one-size-fits-all approach to instruction. Rather, teachers will need to be aware of and responsive to the diversity of the students and the assets and resources they bring from their individual contexts to the classroom. However we note a serious concern about the current instruction this diverse group of students is receiving: even though the majority of ELLs are born in the United States, there is a growing presence of ELLs labeled "long-term English Language Learners," or students who have had the official Limited English Proficient designation for seven years or more (Olsen, 2010).

The Common Core Standards (CCSS) provide an opportunity to implement significant changes to the way in which this diverse group of ELLs are served in American schools and to improve their educational outcomes. Every teacher will now need to be a teacher of the language and literacies that all their students, including ELLs, must possess to act in disciplinary valued ways in their classes. With this goal in mind, we take the view that for children entering school with little or no English, there is a pivotal role for English as a Second Language (ESL) teachers, which is to develop students' initial English language, both social and academic, in deep, generative, and accelerated ways. Once students have reached an intermediate level of proficiency in English, further development of the academic uses of language becomes the responsibility of every teacher. Of course this will require a different level of teacher expertise than currently exists among most teachers. However we regard the advent of the CCSS as a catalyst for change in this regard. As we suggested earlier, because of the diversity of ELLs, there is no single instructional approach. Instead, we take the view that instruction should be based on sound principles that can be enacted within individual classrooms in ways that are responsive to who the students are. Below we offer five principles that have been abstracted from a broad base of literature and from our direct experience of working with ELLs and their teachers over many years.

Principle 1: Learning is always based on prior knowledge and experience. ELLs must have equal access to knowledge that is valued in school. Learners actively construct understandings within a social and cultural context (Greenfield, 2009), building new knowledge on what they already know (Bransford, Brown, & Cocking, 2000; Vygotsky, 1978), and developing the metacognitive skills necessary to regulate their own learning (Bruner, 1985; Rogoff, 1998, 2003; Vygotsky, 1978). All ELLs regardless of their socioeconomic or cultural background take to school immense resources and a range of learning skills that need to be appreciated and built upon. The cultural as well as social foundations of learning are important in that the prior knowledge on which students build new learning is culturally shaped (Greenfield, 2009; Heath, 1983; Rogoff, 2003). This includes ideas about social roles in the

classroom, the role of schooling, and how to use language in the learning process (Bransford et al., 2000).

Academic language has often been conceived of as "decontextualized language" and defined in contrast to conversational language, which occurs in a shared physical context. It is also described as being explicit, as if all that were needed to interpret it were located in the text. However, academic writing is not decontextualized, nor is it fully explicit. It presumes a shared context with its readers who have to "add back in a large piece of the domain conversation that is left inexplicit in the writing" (Gee, 2006, p. 159). Therefore, making meaning of academic language – as with any language – requires drawing on relevant background knowledge and previous participation in discourse, a process Aukerman calls "situating that language vis-à-vis other experiences and what others have said" (Aukerman, 2006, p. 631). This contextualization serves as a gatekeeping mechanism and obscures meaning when students cannot draw upon this shared context.

A common solution to this challenge is to ask ELLs to work with texts of familiar or low- level content and simplified language. This works against their development of academic content, language, and literacy. To advance into what they do not know yet presupposes that their teachers "build the field" (Derewianka, 1991; Hammond & Gibbons, 2005), that is, help them develop the indispensable knowledge needed to construct new understandings. To this end, teachers will need to weigh the appropriateness of texts, taking into consideration a progression of content and linguistic complexity, bridging into new complex understandings and language.

For example, the ELA CCSS suggest reading an excerpt from Frederick Douglas's autobiography in the middle grades. To be able to understand this text, students need to aware of slavery's historical existence in the U.S., and of the conditions and tensions it introduced. Linguistically, the text uses arcane language: "….This bread I used to bestow upon the hungry little urchins, who, in return, would give me that more valuable bread of knowledge…I am strongly tempted to give the names of two or three of those little boys, as a testimonial of the gratitude and affection I bear them; but prudence forbids, not that it would injure me, but it might embarrass them." Historically, it has great value as a counterargument for the existence of slavery. The text merits being read by middle school students.

However, the pertinent questions are *when?* and *with what support?* If the teacher had mostly long-term ELLs in class, she might decide they had enough background knowledge to support their reading. She could not, however, assume that students who had recently arrived from other countries and had interrupted schooling would be able to work through the text meaningfully without her support. She would need to build students' background knowledge of the historical moment and prepare them for the arcane features of the language used. On the other hand, the teacher may decide that while the theme is important, at this moment in the development of her ELLs' English and literacy skills, it may be better to use a comparable text in modern English. Later on, with deeper and wider understandings, students would be able to tackle this text on their own.

Principle 2: Language and cognition develop together and progressively. As ideas and relationships become more complex, so does language. Ever since the emergence of the Sapir-Whorf hypothesis (Whorf, 1956), the general relationship between language and cognition has been disputed (Pinker, 1995), though recent evidence suggests that language does play a significant role in the specification of particular cognitive faculties (Lucy 1992; Gumperz & Levinson 1996; Levinson, 2003). A useful way to understand this relationship may be in terms of Boyd and Richerson's (2005) concept of cultural evolution as a process through which collective

conceptual stabilization is facilitated by the role of linguistic categories. Such linguistic categories make particular relationships more highly codable, and retrievable by individuals and groups. For example, a child may note the recurrence of an object by announcing "another one X", but subsequently refine the intention of the concept of "another one" by replacing it with the predicate "same" while successively touching the two objects (William Ziolkowski, 2011). Here, the underlying criterion for the expression "another one," already cognitively available to the child in 'practical consciousness,' (Giddens, 1984) is becoming articulated through the availability of the term "same", thus entering into "discursive consciousness" and becoming stabilized as a resource for use in ordinary interaction. In this way, an underlying criterion of judgment is externalized through the resources of culture.

Language learning is an essential feature of this process. In the specific context of EL instruction, teachers must pay attention to developing the language necessary to encode emerging concepts across domains so that they can be sustained. Learning concepts is not treated as distinct from the linguistic means through which the understanding is acquired and expressed; the demands of understanding concepts and relationships are not privileged above the demands of linguistic resources, nor vice versa. Thus effective instruction involves the integrated learning of concepts and language through meaningful experiences in conjunction with scaffolding by teachers and peers of the features of academic language, both spoken and written, that are needed to construe meaning (van Lier, 2004; Heritage, Silva & Pierce, 2007). To illustrate the integration of language and understanding, we turn to an example from a kindergarten-first grade science class. The teacher is planning a unit of study to develop the concept of the life cycle and has identified the following goals: 1) understanding that plants and animals have life cycles that include being born, developing into adults, reproducing, and eventually dying; 2) knowing that the details of this life cycle are different for different organisms; and 3) understanding that many characteristics of an organism are inherited from the parents. She decides on the particular language elements that she will be teaching alongside the development of students' knowledge, understanding and skills so as to support their acquisition: the vocabulary and syntax to observe, describe, compare, question, sequence, and report; specific vocabulary, including the nouns *caterpillar*, *chrysalis*, *larva*, the verbs *grow*, *change*, *transform* and *reproduce*, and the prepositions *on*, *over*, *under*, *through*, *inside*, *outside*; words or phrases such as *like*, *same as*, *similar*, and *different*, in order to make comparisons between and among organisms; the use of active declarative sentences that include the specific vocabulary in order to describe a sequence of events; and interrogative structures so students can ask questions as part of their inquiry into the life cycle. Pedagogically, she will develop the children's understanding of the life cycle and the language to support their understanding in the context of first-hand experiences, observations and questioning about phenomena and the use of second hand materials such as charts and books (Heritage et al., 2007).

Principle 3: The goal of learning is to develop the stance of generativity and autonomy. This is accomplished through apprenticeship in which the learner is invited to become a member of a community of practice. Generativity and autonomy refer to the ability students develop to support their own learning by using independently what they have learned in the context of apprenticeship with peers or adults within a community of practice (van Lier, 2004.) Communities of practice are organized so that learning occurs in ways that contribute to the students' development of strong identities as learners and as effective participants in the social practices of their learning community. Participants operate within a situation of shared expectations and anticipated outcomes, and accepted and consistent regularities of activity, social and interactional practices and behaviors. Individuals participate in these practices of the community and, in turn, the collective practices of the community are mutually co-determined by the participant individuals (Lave, 1988).

Acquiring the linguistic resources is a vital condition to participate in communities of practice (Block, 2003; Firth & Wagner, 1997; Lantolf & Thorne, 2006). However, without a teacher who is able to invite and support students' participation, resources, while necessary, are not sufficient. Students are socialized into the academic practices of disciplines through joint activity and by being provided with the support, or 'scaffolding', and with the opportunity to practice and eventually own or appropriate practices so that they become generative (Lave & Wenger, 1991; Schleppegrell & Colombi, 2002; Walqui & van Lier, 2010). In this sense, scaffolding is the "just right" kind of support required by students to engage in practice that helps them mature processes which are at the cusp of developing, while simultaneously engaging their agency. Pedagogically it entails participation in a task or project with predictable rules and recurring elements. This structure *only* exists to enable the unexpected, the unpredictable to occur. The framework of the task makes the innovation possible. For example, in an upper elementary math class students are working in groups of four to complete a graphic organizer (a Frayer model) to explore key properties and characteristics of a parallelogram. The process the teacher invites students to follow involves one student at a time offering an idea, which is then echoed and refined by a second student, then discussed by the whole group to reach a consensus, and finally is written up by all. In this case, the scaffolding manifests itself both in the use of the graphic organizer and in the participation structure. The graphic organizer focuses students' attention to key characteristics of the figure and the process enables all students to participate and refine their understanding and concomitant use of language. In the revisions and fine-tunings the language gets increasingly more academic. Furthermore students' appropriation of conceptual understandings and the language needed to express them meets their diverse needs since the activity has multiple points of entry. What students did in collaboration in class, they will be able to do alone in the future if supported by a teacher's well-designed activity. We see this stance of generativity and autonomy as being essential to college and career readiness, to success in the 21st century, and an espoused goal of the CCSS.

We further illustrate the process of participation in a community of practice in the following example. In a 5th grade writing class, the students are learning about persuasive writing with a focus, selected by the students, on "saving the environment." The students have learned about the idea of "arguments" and reasons to support the argument, as well as learning about developing counterarguments. One student, Angelica, who has written her arguments and counterarguments, requests a one-on-one conference with her teacher during independent writing time, opening with an invitation: "I would like to get your feedback." With this statement, Angelica is registering her agency as a participant in a community of practice. The teacher engages in the conversation with Angelica, first by asking what she is working on and then what she would specifically like feedback about. Her approach acknowledges the child's agency in the work and her own role as an assistant in supporting Angelica's writing. Angelica has started her piece of writing with two questions and is unsure if this is an effective beginning. In the collaborative discussion that ensues, they simultaneously conclude, in a meeting of minds, that the two questions address different aspects of the same topic and could be combined into one question. Satisfied that she has a solution, Angelica thanks her teacher and continues to revise her work independently.

In these examples, we see teachers who have established the norms, values, and routines that are understood and shared by all participants in a community of practice. That facilitates and hones generative learning and autonomy.

Principle 4: The goal of language use is to make it contextually appropriate; students need to be competent navigators within a range of different registers. Language is a tool human beings use to get things done in the real world. Acquiring proficiency in a language

entails developing a linguistic repertoire with which to negotiate different situations and cultural practices (Bialystok & Hakuta, 1994; Valdés, Bunch, Snow, & Lee, 2005). Skilled language users vary their use of language depending on the context and on their purposes, employing different registers and genres as communicative resources. Registers are language varieties associated with a particular situation of use, and genres are regularly-occurring spoken and written message types that fulfill similar communicative purposes, have familiar organizational patterns, and recognizable linguistic manifestations (Derewianka,1990; Halliday,1994). Bauman (2001) describes genres as orienting frameworks that support our interpretation and creation of meaningful language.

To acquire these skills students need access to fluent models and opportunities to participate in interactions where they are also asked to recognize texts as instances of specific genres, with clear, understood purposes, and similar language features to then produce responses and engage in extended discourse.

For teachers of ELLs, it will be important to adopt the stance of assisting students to recognize the context in which specific language registers are appropriate – a case of *when* rather than an approach of *you can't*. This presupposes that when teachers are teaching, that they are aware of the contexts of use and how to bridge students' competence with new registers. Similarly, when students engage in communicative practices teacher emphasis should first be placed on their understanding of the purpose of communications, their recognition of genres (for example, "this is an argumentative essay that has as its purpose to convince me of the value of saving water as part of my daily routine," "this is an autobiographical essay where the author wants to share with me some events in his life"), then on how students organize their ideas, and only finally on issues of correctness in language use (accuracy).

Principle 5: Assessment is integrated into the process of teaching and learning. Assessment-elicited information is used by both teachers and students to consistently keep learning moving forward. In addition to being principled, learning for ELLs must also be contingent. Contingent learning occurs when teachers and students take the opportunity to build on what students already know to move them incrementally through a process of scaffolding from their current state of learning to a more advanced state. Contingent learning is dependent on a steady stream of information about how learning is progressing while it is in the process of developing. In the case of ELLs, teachers need to pay close attention to emergent language and content learning during the ongoing course of instruction so that they can adapt their teaching to keep student learning moving forward. Only when assessment is integrated into the process of teaching and learning will teachers and their students have the information they need to engage in contingent learning.

When assessment is integrated into teaching and learning, three key questions provide a framework for action: Where am I going? Where am I now? Where to next? (Hattie & Timperley, 2007; Sadler, 1989). In the context of language learning, to answer these questions, teachers and students first need a clear roadmap for learning, a progression of how language develops at the discourse, sentence, and word level across modalities and within different content areas (Bailey & Heritage, 2008; Heritage & Bailey, 2011). This means that there will be multiple, related progressions of the sequence of necessary linguistic skills and knowledge associated with specific disciplines in listening, speaking, reading and writing. These include the discourse features needed to describe content area phenomena, the tenses required for both understanding and expressing causal relationships, and the vocabulary needed to understand concepts (for a more detailed description see Heritage & Bailey, 2011). From these progressions, teachers identify specific short-term language learning goals (*where am I going?*),

sometimes in collaboration with their students, which are the target of immediate teaching and learning. Second, teachers gather evidence about the students' current learning (*where am I now?*). When assessment is integrated into learning, there is no single way to collect evidence. Evidence gathering can occur through teacher-student interaction, student-student interaction, tasks, and observations of actions (Heritage, forthcoming). From these sources, teachers draw inferences about students' learning relative to the intended learning goals. Whatever the source of the evidence, the role of the teacher is to construct of devise ways to elicit responses from students that are revealing of their current learning status (Sadler, 1989). To answer the final question (*where to next?*), the data need to be interpreted in relation to the learning goal so that both teacher and student can make decisions about next instructional steps.

To illustrate this process, below we describe two examples of assessment integrated into language instruction. In Ms. Olvera's third grade classroom of dual language learners, the children are learning about rock formation and because Ms. Olvera integrates reading, writing, listening and speaking into her science content, they have been reading and discussing text on the topic. Her current English language focus with the students is the development of interrogative structures and the use of specific topic vocabulary: *rock*, *mineral*, *igneous*, *sedimentary* and *conglomerate*.

She uses three sources of data to inform her and her students about their English language learning: 1) student responses to her questions in the discussion section of the lesson; 2) the oral questions about the text that she asks particular students to construct and the feedback that peers provide to them; and 3) students construction of questions that they think are answered by the text they have just read. They post their notes on what Ms. Olvera has labeled a response board (Figure 1 shows a sample of the post-it notes). When the questions are posted, Ms. Olvera leads the students through a discussion of the responses (without revealing who wrote which) to consider the degree to which the target vocabulary has been used, the question structure employed and suggestions for improvement.

At the lesson's conclusion, Ms. Olvera and her students decide that they need to continue the focus on vocabulary usage, particularly in relation to rock types, and to revise their questions in light of the feedback they have received from their classmates. Ms. Olvera also notes specific students whom she has decided need more focused work on question structures, for example, those influenced by Spanish language word order.
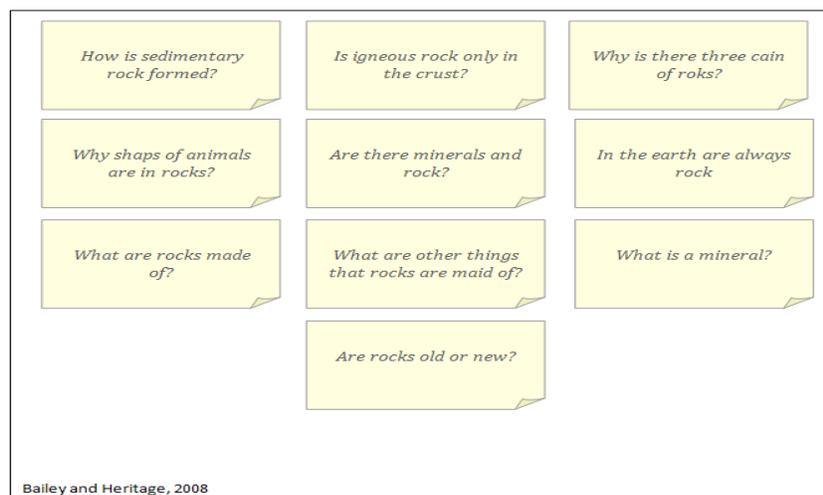

Figure 1. Student questions

Our next example comes from a secondary ESL class, with newcomers whose experience in the United States ranges from three months to two years. The teacher, Mr. DeFazio, has created a five-week unit on linguistics with the purpose of guiding his students through a deep exploration of an academic theme, while at the same time placing a focus on the language needed. This is the third class of the first week on the unit. Having formulated questions they would like to explore around language, students have then perused a variety of texts on the theme to get some information. They now write a letter to a person they know, telling them what they have learned so far about language. Before the lesson is over, five students write their beginnings on large sheets of paper to enable a discussion on what they have done and where they may go next. An animated conversation develops on whether animals have language or not. Julio, not part of the five initial volunteers, decides to read his letter aloud to the class.

> *Julio*: … First of all, I think that language is a way to inform others around you, your feelings or just a simple thing that you want to let know people what is the deal. And it can be expressed by saying it, watching a picture, or hearing it, you know what I'm saying? I don't know if you have heard about the kangaroo rat that stamps its feet to communicate with other rats. It's really funny 'cause we humans have more characteristics to communicate to each other, but we still have problems to understand other people. Characteristics like sound, grammar, pitch, and body language are some of them, while the rat only uses the foot (he stamps the ground).

In this lesson, we observe that the teacher has chosen the genre of letters, to have students write with the comfort that letter writing affords. This provides Mr. DeFazio with feedback on what the students understand, and how they are able to express these ideas in emergent academic uses of English. He then leverages his understanding of what students have developed to determine next steps in the process to extend his students' cognitive, academic and linguistic skills. In the above example, Julio demonstrates his understanding of the concept of language.

Both examples show how teachers focus on students' evolving understandings to decide where additional support needs to be centered so as to ripen in their students what is ready to develop.

Conclusion

The advent of the CCSS provides us with an unprecedented opportunity to reconceptualize how ELLs come to acquire increasingly sophisticated understandings, the linguistic resources to internalize and express them, the stance of generativity and autonomy, as well as adeptness in the range of language registers. This opportunity entails a retooling of the education profession to develop the skills to realize the immense potential that diverse groups of ELLs bring to American society. If we fail to take this opportunity, we risk doing a disservice to our students and to our nation as a whole. It is an opportunity we must surely grasp.

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Teacher Development to Support English Language Learners in the Context of Common Core State Standards

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The Common Core State Standards (CCSS) define the knowledge and skills in English language arts and mathematics that students need for success in college and careers upon high school graduation. These widely adopted documents create powerful, unique and unprecedented opportunities to design and implement high quality education across the majority of states. The Next Generation Science Standards (NGSS) are expected to do the same in the sciences.

Assessments aligned to the CCSS are being developed by two assessment consortia (SBAC and PARCC) to track students' progress over time. The standards and the work of the assessment consortia aim to focus the academic core and to organize instruction around a set of learning progressions along multiple dimensions within subject areas. They promise to integrate the teaching, learning, and assessment systems that have grown fragmented in many American school districts and to transform teaching and learning across classrooms and schools.

The content, performance, and language demands in the new standards and assessments are deeper and greater than those in most previous state standards. These challenges will impact all students and are especially challenging for English Language Learners (ELLs).

Demands of the New Standards

The new standards require students to engage deeply with complex text within and across all three disciplines. The CCSS for ELA/Literacy include three key shifts that reflect the demands of college and career readiness:

- An emphasis on text complexity and language (academic vocabulary and function).

- Increased emphasis on building knowledge from informational text.

- An expectation that students will produce and use evidence in text to justify their views.

The CCSS for Mathematics move instruction and assessment beyond the notion of answer-getting driven by procedurally-based questions to one that focuses attention on students' mathematical sense making and understanding. The standards envision:

- Problem situations that are language-rich and require multiple steps. Students will be expected to decipher text for relevant phrases and for specific use of language structures and vocabulary, relationships, important concepts, and goals to tackle problems situations.

- Concepts represented in multiple ways. Text can require students to translate between and among words, numbers, tables, diagrams, and symbols. Students will need to understand these various representations and move among these various types of texts (representations) in mathematics.

- Procedures that constitute a special narrative. They are step-by-step actions that lead reliably to a result. They are not merely procedures for getting answers. Students will be called on to determine relevant ideas and the reasonableness of an answer.

The Next Generation Science Standards (NGSS) are currently being developed based on a recently-released Framework for K-12 Science Education written by an expert panel convened by the National Research Council. The framework reflects leading thinking on the nature of the science and engineering education that is needed in the 21st century. Its vision of science learning is predicated on language and literacy and builds on the CCSS in ELA and math. Based on the Framework and the nature of the field, we can expect the science standards, and related instruction and assessment, to pose the following expectations:

- A technical vocabulary that is peculiar to each science discipline, requiring students to code-switch from everyday uses of language to the language of science (Brown & Ryoo, 2008; Moje, Collazo, Carillo, & Marx, 2001).

- Information conveyed not just through texts, but also through visual representations including pictures, drawings, diagrams, graphs, charts, tables, maps, and equations.

- Texts that have features unique to science, including the use of passive rather than active voice, nominalization, abstraction, embedded clauses, and lexical density to build cohesion (Schleppegrell, 2004).

Across these disciplines, learning and assessment tasks will require students to engage in greater written and oral discourse, as well as argumentation from evidence – a practice found across the disciplines. We highlight this practice because it represents a significant teaching and learning demand across the standards. This practice has a common structure built around claims and evidence, and the ways in which students engage in arguments (discourse) in the classroom setting will have overlapping features across disciplines. However, the ways in which evidence is used in each discipline will vary. For example:

- In English Language Arts, students will need to "write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence." (CCSS ELA/Literacy, p. 42).

- In mathematics, the CCSS call for students "to construct viable arguments and critique the arguments of others." (CCSS, Standards of Mathematical Practice, p. 6-7).

- In science, when students engage in argumentation, they use models as evidence, construct explanations using evidence and logic, and evaluate and communicate information. (NRC Science Framework, Science and Engineering Practices).

Implications for Teacher Development

The content, performance and language demands of the new standards and aligned assessments will augment the challenges for English language learners. Teacher preparation and professional development programs will need to be designed to support the deeper content, performance and language demands expected of students. Consequently, the content, quality and delivery of professional learning opportunities will need to support teachers' deeper understanding of content and mastery of instructional strategies that assist all students' attainment of more rigorous standards.

Meanwhile, Institutions of Higher Education (IHE), school districts, and other partners need to prepare both for the implementation of the new practices and for the impact of new standards within and across systems. Institutions will also need to prepare leaders to guide and support the changes required to implement the CCSS and NGSS. These systems will need to build the capacity of all educators to serve all students, with special attention to the needs of English language learners, who are a growing share of the school population.

Educational attention to the needs of ELLs can no longer be considered a boutique proposition concentrated within a handful of states. By 2010 Limited English Proficient (LEP) individuals accounted for nine percent of the US population over the age of five. Between 1990 and 2010 the number of LEP individuals in the US grew by eighty percent, with significant growth in states that are not traditionally considered immigrant-destination states. Five states with the largest share of LEP residents have adopted the CCSS: California, New York, Florida, Illinois and New Jersey serve 54.1% of the total LEP population (Migration Policy Institute, 2011). Educators in these five states and those in the more than 40 other states that adopted the CCSS are charged with ensuring that implementation of the new standards and assessments attends to the challenges for students classified as ELLs.

Educators will need to understand the shifts required in curriculum, instruction and assessment for implementation of the new standards, and then they will need to have hands-on opportunities to acquire teaching strategies that respond to these shifts. These shifts in practice will rely on deep content knowledge that is pedagogical in nature. Educators will need to understand deeply the core areas of the disciplines and the learning progressions that operate within the domains of each discipline. They will also need to know a great deal about formative assessments to help them understand where students are in relation to the learning continuum, and they will need to have a variety of curriculum and instructional supports to respond to students' needs in ways that produce deep learning.

In addition, for meeting the specific needs of English learners, teachers need to know how to address:

1. Language progressions - How students learn language, both in terms of general language acquisition and in terms of the acquisition of discipline-specific academic language;

2. Language demands - What kinds of linguistic expectations are embedded within specific texts and tasks with which students are being asked to engage;

3. Language scaffolds - How specific representations and instructional strategies can be used to help students gain access to the concepts as well as to the language they need to learn; and

4). Language supports - How classrooms and schools can be organized to support students in continually building a deep understanding of language and content.

Language Progressions. The CCSS seek to build on what is increasingly known about progressions of learning within some disciplinary domains – that is, the sequence in which most students tend to acquire certain kinds of skills in reading, writing, and mathematical understanding. The CCSS use this notion of progressions to create the framework for a curriculum and instructional sequence outlining what should be taught from grade to grade. This sequence of topics and concepts also implies a progression in the learning of domain-specific language needed to understand these concepts and to express ideas about them. It will be important for curriculum developers and teachers to make explicit, study, and then be prepared to teach these implied language progressions in a coherent, conceptual fashion that also takes advantage of what is known about language acquisition generally.

Language Demands. Teachers and curriculum developers will also need to consider the language demands embedded in particular texts that students will encounter and in tasks that they are asked to perform in the classroom and on assessments. It is important for teachers to understand that disciplines like mathematics, science, history, and language arts each embody languages unto themselves – bodies of domain-specific representations and vocabularies – as well as bodies of content knowledge. When developing lessons and assignments, and when choosing materials, teachers need to know how to evaluate both the content demands and the language demands that they imply. Analyzing these demands means asking: What do the students need to know about the content in order to enter into this task? What language must they understand? What prior teaching is needed and what other tools can be provided to make these accessible so that students can work with the content and the language to progress in their understanding?

Language Scaffolds. Once teachers have analyzed the language and content demands of the curriculum, they need to design learning experiences to help students meet these demands. The design of tasks needs to consider the disciplinary language demands for specific concepts and topics in addition to the language proficiency of students. Within disciplinary tasks, teachers

need to know how to provide scaffolding through the use of multiple representations, including choice of texts and tools (dictionaries, glossaries), teaching of key vocabulary, visual representations, models, strategic questioning, and coaching. Language scaffolds need to be purposefully aligned to concept and skill development targets as well as to language development goals. Teachers need to learn how to develop scaffolds with attention to their purpose: to support both comprehension and student production of language that allows them to express their ideas. As teachers learn to support student production of language, they need to understand how to elicit and interpret what ELLs know and can do by giving opportunities for communication using multiple forms of representation, and by focusing on concepts rather than getting distracted by syntax and other peripheral concerns.

Language Supports. While supporting access to content, teachers of ELLs are called upon to accelerate English language development and literacy and, in bilingual classrooms, native language and literacy development. Thus teachers need to know how to create classrooms that are supportive of using and learning language. Such classrooms benefit all students and are essential for ELLs. To do this, teachers must learn to:

- Build opportunities for students to learn language and content from each other through purposeful, carefully structured and scaffolded tasks;

- Create engagement and discussion opportunities that socialize students to the language of the discipline through structures and routines that develop skill in disciplinary discourse;

- Carefully organize groupings (pair, small group, and whole group) in classrooms to amplify and enrich the opportunities for comprehension, discussion, and interactions with ideas;

- Consider student's language proficiency and native (home) language when organizing students in groups for the purposes of learning (mixing diverse proficiency levels of the same native language) and production (mixing students from diverse native languages).

- Take advantage of the assets of diverse students by understanding students' language skills and their culture, background knowledge, and experiences.

The Design of Teacher Learning Opportunities

Both pre-service preparation and ongoing professional development should enable teachers to create both the dispositions and competencies to serve all students well. Both need to be designed with the interrelationships between content and language in mind. Finally, both initial teacher preparation and ongoing professional development should start from a recognition that teacher inquiry provides a powerful framework for teacher learning.

In initial teacher preparation, teachers need to develop a foundational understanding of content pedagogy that incorporates an understanding of the language of the discipline(s). They also need to develop a foundational understanding of language development and strategies for teaching English learners, preferably with applications *within* the discipline(s) they will be called upon to teach.

In addition to linguistic knowledge that sensitizes them to the nature of language and its use, pre-service teachers should learn about approaches to language learning that can build bridges between students' native language knowledge and their evolving acquisition of a new language in an academic context.

Pre-service teachers should examine the CCSS, including the kinds of tasks students will be expected to undertake in learning the standards and demonstrating their knowledge. They should also learn how to evaluate the content and language demands of these tasks, as they learn to build curriculum, lessons, and assignments, and how to create scaffolds for enabling students' entry into the tasks of learning. Just as students learn by doing, teachers also learn about practice *in* practice. Thus pre-service preparation should link coursework to fieldwork that allows the application of theory to practice. Assignments in teacher education classes should engage novices in assessing students, designing lessons, trying out strategies, evaluating outcomes, and continuously reflecting with expert guidance on what they are learning. The clinical curriculum should be directly tied to the coursework novices engage in. And cooperating teachers and supervisors should be chosen for their own expertise as teachers of English learners.

Where this happens, new teachers enter classrooms prepared to work effectively with their ELL students. (For examples of teacher education programs that accomplish this, see Bransford & Darling-Hammond, 2005; Darling-Hammond, 2006). However, initial preparation is currently highly uneven and teachers typically have very different levels of knowledge and skill for teaching all students. In this context, districts and schools must be able to figure how to design professional development that is useful to diverse teachers and meets their needs.

Professional development opportunities need to be designed to build the knowledge, strategies and skills of all teachers of ELLs to integrate language development scaffolds for students at varying level of English proficiency within a classroom. Schools and districts need to combine information on teachers' skills and felt needs with English learner classification data (for current and former ELLs) and performance data to determine where professional development would help build teacher capacity.

Disciplinary teachers of ELLs will typically benefit from professional development on academic language and literacy that introduces them to scaffolds and strategies aligned to language functions and structures in the discipline, supports the design of tasks, provides coaching, and allows time for reflection during implementation. Teacher capacities and the capacities of sites will be important in the design of professional development and the pace of improvement in teacher practice. Shifts in teacher practice will require sustained and varied support structures to apprentice teachers to new practices in ongoing classroom instruction, curriculum planning, and assessment.

Schools and districts should identify and support expert teachers who act as models of strong teaching practice for ELLs. To ensure that expert practices are disseminated, master/ mentor/cooperating teachers will need to have opportunities to continually develop their

expertise so that they can model strong practices. Teachers benefit from observing the classrooms of master practitioners for content and academic language development. Teams of teachers can deconstruct the classroom practice, supported by professional development leaders and observation protocols. Coaching from master teachers in developing these elements of practice helps strengthen implementation. Schools and districts need to structure time and build observation protocols for learning visits of educators to observe student practice in classrooms that align deep subject matter and language development to support ELLs.

Expert knowledge infused into professional learning will need to include a combination of language and content expertise. These individuals can come from within schools and districts, or externally, through partnerships with support organizations and/or research partnerships with institutes of higher education. Experts can support cross-role teams (including, for example, parents, teachers, and administrators) and job-alike teams to provide opportunities to try out new practice, reflect on what they are seeing, and build curricular coherence.

A district can facilitate a learning community for a set of school-based cross-role teams focused on a shared problem of practice. A cross-role team is composed of key constituencies from a school site that share in leadership for implementing changes to address a problem of practice. For example, in one district a set of cross-role teams engage in inquiry (what is the set of strategies that will accelerate conceptual and language development for ELLs in science in our community?). They learn from experts and from engagement in their peer group in planning with their cross-role team.

The cross-role teams are composed of school-based leaders that include at minimum the principal and teachers. Some teams include parent leaders as well. During the team learning institutes the district establishes an engagement structure for each day. For example, during the morning, principals, teachers and parents may engage in a science task and discuss the learning (e.g., identify targeted and supporting concepts and language functions and structures in the lesson, as well as strategies employed to support learning and language development). They then may work in role-alike groupings across the district, discussing implementation possibilities for their leadership roles. Individuals may then return to their cross-role teams with ideas for integrating the new strategies into the science learning at their schools. For example, parents might collaborate with teachers in hosting family science sessions that integrate the new strategies. During the afternoon, schools share what they plan to integrate from the day's learning. Teams are regularly asked to report to another school on the impact of prior implementation efforts. This type of cross-roles and job-alike teamwork is initiated in the summer, and teams continue meeting regularly during the years.

Job-alike teams allow individuals in similar positions to grow as professionals. Teachers can learn about classroom practice, while principals can learn about how to support this practice. Cross-role teams empower sites to take charge of their learning at the school sites. School leaders' engagement with professional development is critical. Principals need to support the efforts of teachers to learn in a range of contexts and structures. That learning time needs to scheduled and protected.

Designers of teacher preparation and professional development programs need to consider the integration of resources and expertise across disciplinary content, literacy and English language development. The traditional isolation of supports for ELLs in literacy and language development will be insufficient to help students engage the new demands of the CCSS and NGSS. All teachers of ELLs need to increase their language and literacy development skills to design and deliver curriculum, instruction and assessment in core content areas. Educators with deep disciplinary knowledge and content pedagogical skills will need to partner with English language development specialists to guide professional development.

Together in these cross-disciplinary (content and language specialist) teams, educators can think about unique uses of language in content areas. For example, words like "if" and "of" have special implications in a mathematics word problem and in the Common Core standards. They can work on designing instruction that will help students "break the code(s)" and learn how to make sense of these different uses of language. Such teams can also help teachers learn how to develop tasks that provide access for students and how to choose texts that are appropriate. Teams of educators can work together to design and share tasks and lessons, try them out, bring student work back to the table, and reflect on the tasks and how to refine and use them in a growing base of tested curriculum.

By enriching the curriculum for students in this teacher-engaged manner, professional development can increase the effectiveness and quality of teacher's professional practice. For this strategy of research-informed practice to be well-implemented, it is critical to prepare teachers for collaboration. Through sustained learning institutes, secondary subject matter teachers and English Language Development (ELD) specialists can collaborate to build shared understandings of the challenges confronted by students learning new content and language. These subject matter networks will build teacher capacity to design instruction collaboratively and to integrate ELD strategies in core courses.

Sustained subject matter networks focused on problems of practice, such as the performance of long term ELLs in Algebra, can integrate and combine expertise to develop and test solutions to break the barriers that impact learning and performance. Teachers need the opportunity to deconstruct the problem within their own context so that they can make the learning applicable to their classrooms. They can study artifacts such as student work and videotapes of teaching to illustrate the problem. To facilitate disciplinary and language work, some schools have developed new structures in which subject area teachers work with ELD teachers to study, practice, co-construct and deliver lessons. This requires that school leaders schedule planning time for these teachers, and where team teaching is involved, it also requires scheduling ELD teachers to co-teach in content classes in addition to providing targeted supports in ELD classes.

Districts can support this kind of work within schools. They can also initiate and support cycles of inquiry across schools. Districts can provide economies of scale and a wider range of expertise, not just what is isolated at the school site. Whereas schools as the sole unit of

professional development can be inefficient and ineffective, clusters or networks of schools with common needs can work with expert knowledge via professional development, and integrate new knowledge and practices within their own context. Such professional development becomes a cycle of working with expertise, reflecting, and refining practice.

School-based or district networks can also create a culture of supported accountability through the study of artifacts (student work, videos, etc.) for shifts in practice that are public, transparent, and results-driven. Teachers can benefit from opportunities to study student work and assessments for their reasoning and production of language aligned to standards. Teachers also benefit from the analysis of text complexity in the textbooks, articles, problems or other sources used in their diverse disciplines. These types of professional learning activities not only heighten awareness, but offer significant benefits to improve ELLs' access and production. Leaders need to provide time for teachers to study texts, tasks, and assessments, and to examine student work products at different levels of English proficiency in collaboration with content, ELD and literacy experts.

Elementary and secondary bilingual teachers that are instructing in languages other than English need professional learning opportunities that build their competence and confidence with academic discourse in languages other than English. Many bilingual teachers have not had the opportunity to engage in deep study of the subject matter and pedagogy in languages other than English. Their use of the language other than English in instruction is usually limited to translating. To engage students in deep disciplinary discourse as they develop concepts and build skills in student's native language, teachers need a stronger command of the academic language in the targeted language of instruction. Their command of the language other than English in the disciplines would be enriched through professional development delivered in the target language that helps them learn and practice academic discourse in the target language for the discipline.

For example, New York City supported Spanish bilingual teachers' mathematics and literacy professional development by providing Spanish-delivered institutes for mathematics and literacy professional development, which improved instruction and student performance in elementary mathematics and literacy (Master et al., 2012). Institutes such as these deepen teachers' mathematics competencies and facility with academic language in the Spanish as well as language transference in English. Bilingual instruction can be enriched by teachers who can design and deliver robust instruction in the target language with appropriate English language transfers. Given the demands of the Common Core Standards and Next Generation Science Standards, districts should consider how to strengthen the capacity of teachers to deliver richer bilingual instruction.

Elementary teachers will also benefit from collaborative networks focused on subject matter disciplines, especially in the upper elementary grades where the content demands of teaching and learning have increased beyond the traditional comfort and confidence level of many teachers, especially in elementary science and mathematics. Growing communities of science and mathematics educators will be needed to increase access to robust learning in these

disciplines. To offer ELLs access beyond basic skills in these fields, capacity development for teachers of ELLs needs to include content and pedagogy, as well as language development.

In sum, new and deeper academic and language demands on students will require new skills from teachers and school leaders. In communities with ELLs, the demand has been amplified even for educators that have been successful under traditional supports and programs. Institutions will need to consider more aggressive and creative capacity-building initiatives that strengthen and integrate the development of disciplinary teaching strategies with literacy and language development strategies.

This will require new partnerships, structures for collaboration, and time to engage content, practice, language development and literacy experts in the design and delivery of teacher preparation and professional development. Multiple and sustained opportunities will be needed for the deliberate integration of resources and expertise to deepen and accelerate teacher learning of high impact practices to graduate ELLs ready for college and careers.

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Challenges and Supports for English Language Learners in Bilingual Programs

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The broad impact on American public education of the 2010 Common Core Standards and the frameworks for K-12 science education (National Research Council, 2011) cannot be overstated. Indeed the Common Core has now been officially adopted in 41 states, and unofficially in two more (ASCD, 2012), which is as close to a national set of English language arts and mathematics standards as American public education has come in generations. The new K–12 science frameworks also represent a fundamental paradigm shift as instructional practice becomes focused on the intersections between the doing of science and the language of science.

The Common Core and the new science standards (the combination of which we will henceforth refer to as the New Standards) have in common a focus on the integration of language and literacy into content area instruction. Specifically, the Common Core Standards require that students read and comprehend texts, particularly informational texts, with increasing levels of complexity. Students should be able to write narratives, informational and explanatory essays, and arguments. They also should be able to use their oral language skills to work collaboratively, understand multiple perspectives, and present their own ideas (see Bunch, Kibler & Pimentel, 2012). In the area of mathematics, the New Standards support (a) promotion of mathematical conceptual and procedural understanding, (b) presentation of rigorous mathematical tasks, (c) development of beliefs that mathematics is worthwhile and doable, and (d) engagement of students in different mathematical practices (see Moschkovich, 2012). To carry out mathematical learning, students must be able to use and understand mathematical language. The Next Generation Science Standards set forth similarly high levels of cognitive and linguistic demands for learning and teaching (See Lee & Quinn, 2012 for full discussion).

The role of language in the New Standards is profound, which has implications for English learners' access to them, particularly when instruction is in English only. Indeed, published guidance on applying the Common Core for English learners (http://www.corestandards.org/assets/application-for-english-learners.pdf) acknowledges the potential leveraging role of students' native languages alongside the vast heterogeneity in the ELL population. Yet implicit in the guidance is the presumption that instruction will take place in English only. There is, however, abundant research showing that well-implemented and high-quality bilingual education programs worldwide succeed in educating language minority and majority students (August & Hakuta, 1997; Brisk, 2005, 2006; Cummins, 1999; Cummins & Corson, 1997; Gomez, Freeman, & Freeman, 2010; Lindholm-Leary, 2001). With the rising

interest in high academic achievement that includes high levels of language and literacy development, bilingual education should be considered as a viable form of education to reach the goals expressed in the New Standards. This paper summarizes the affordances of, and challenges to, implementing native language and English instructional programs as they pertain to implementation of the New Standards.

Affordances of Bilingual Programming

The use of students' native languages by teachers and other students has been associated with better social skills and students' well-being in schools (Chang et al., 2007). Moreover, a bilingual setting defines "students' linguistic and cultural resources as assets" (Michael, Andrade, & Barlett, 2007, p. 169), positioning students as successful from the start. In bilingual schools, the norm is bilingualism, posing no threat to students' identity. In monolingual schools, students often struggle with cultural adaptation, unsure of whether they should or should not make apparent their other language and culture (Phelan, Davidson, & Yu, 1998). Further, the presence of bilingual personnel facilitates students' immediate connection with adults in the school without having to wait to master English.
These professionals provide a strong in-house model of academically successful bilingual adults (Garcia & Bartlett, 2007; Michael et al., 2007). High quality bilingual programs that promote learning <u>of</u> and <u>in</u> two languages are a prime educational setting to support the new content and language demands of the New Standards. These programs (1) facilitate language, literacy, and content-area learning by providing students with the opportunity to function in the language in which they can best carry out relevant tasks and (2) promote high levels of bilingualism which positively impact literacy and cognitive development consistent with the demands of the New Standards.

Linguistic Facilitation. Bilingual programs, which have grown increasingly rare in recent years, offer great affordances in easing the implementation of the New Standards because teaching and learning, particularly in the content area, occur in the language in which the student is most fully proficient. Thus students are far more likely to be able to access the complex integration of language and content that characterizes the New Standards. In the area of literacy, research has demonstrated the positive impact of acquisition of reading through the first language (L1) (Garcia, 2000). Furthermore, L1 reading proficiency has been consistently shown to be associated with second language (L2) reading and writing irrespective of native language (Cummins, 1991; Proctor, August, Snow, & Barr, 2010). However, such associations are strongly linked with degrees of L2 proficiency, which underscores the need for bilingual programs to be actively developing both L1 and L2.

The New Standards for oral language expect students to present their own thinking and understand others' perspectives (see Bunch et al., 2012). Classroom interactions that permit negotiation of ideas and meaning encourage this kind of learning. In environments that promote bilingualism students are less likely to feel inhibited to participate because all linguistic channels

are open for use, which allows for free codeswitching and thus concentration on the topic rather than struggling to find the words (Garcia & Bartlett, 2007). Further, when students are functioning in a weaker language, their acquisition of content becomes more challenging (see Bunch, et al., 2012; Lee & Quinn, 2012; Moschkovich, 2012). When English learners are exposed to content instruction in the stronger language, they are more likely to grasp the concepts of instruction, which sets the stage for promoting second language acquisition. With the conceptual foundations established via the native language, English language instruction can begin to draw students' attention to more salient aspects of second language acquisition, including syntactic, semantic, and morphological development. As these components of English develop, the access to the New Standards provided through native language instruction should begin to manifest cross-linguistically.

In sum, drawing on all the students' linguistic resources allows them to function at a higher cognitive and age-appropriate level (Milk, 1990). As a consequence, academic rigor is not sacrificed because of limited language proficiency (Garcia & Bartlett, 2007).

Benefits of Bilingualism. The New Standards are compelling for a number of reasons, not the least of which being that they require students and teachers to pay strict attention to language and how it is used. For example, in Grade 5, the Language standard L.5.3 requires students to compare and contrast varieties of English (such as dialects and registers). In Grade 8, students must use context to derive word meanings, make morphological inferences, and infer meanings from definitions (Standard L.8.4). Finally, in Grades 11–12, Standard L.11-12.5, students are expected to interpret figures of speech and analyze their role in text. These skills are highly *metalinguistic* in nature; that is, they require that students be particularly attentive to the features and uses of language. In addition, the New Standards require students to understand symbolic representation and to problem solve. The literacy embedded in content standards for grades 6–12 make this abundantly clear as students must be able to integrate visual information into their written texts (RH.6 – 8.7), "[t]ranslate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words" (RST.9-10.7), and to represent and interpret mathematical data (5.MD).

In a recent meta-analysis of the cognitive correlates of bilingualism, Adesope, Lavin, Thompson, and Ungerleider (2010) found overall effects for bilingualism, irrespective of SES, on two major areas: metalinguistic and metacognitive awareness; and symbolic representation, attentional control, and problem solving. Moderator analyses indicated that Spanish-English bilinguals were highly likely to derive metalinguistic and metacognitive benefits from bilingualism, whereas French-, Chinese-, and Tamil-English bilinguals were more likely to see enhanced aptitudes in the second realm of symbolic representation, attentional control, and problem solving. The links between bilingualism and the metalinguistic and problem-solving foci of the New Standards should be highlighted as highly congruent with one another. Indeed, successful bilingual programs that attend to strong L1 and L2 development, and to comparing and contrasting languages of instruction, may in fact accelerate meeting the demands of these highly language-based New Standards.

Additional Benefits. The New Standards, and particularly the New Science Standards, make the important point of promoting equity in science instruction in the United States. Specifically, the panel for the K-12 Education Frameworks argued that children who hail from varied cultural backgrounds bring with them specific knowledge about events and phenomena that are foundations upon which to build. Bilingual programs are uniquely positioned to support students who speak languages other than English in these ways. Interactions between adults and children differ among people of different cultural backgrounds (Conklin & Lourie, 1983; Heath, 1983) and these norms carry into classroom settings with positive or negative consequences. Bilingual-bicultural classrooms more typically accept and understand students' ways of behaving and talking derived from their heritage culture. Acceptance of these ways invites these learners to engage in classroom discourse and as a consequence in learning (Jordan, Tharp, & Baird-Vogt, 1992; Phillips, 1972). Ballenger (1997), for example, argued that allowing Haitian children to incorporate their personal and moral standing in science discussions actively engaged these students in discussion and learning. Although the science was embedded in the students' personal experiences, they were able to keep their focus on the science questions. Eventually students appropriated the science discourse that typically shies away from the personal and moves toward the objective.

Challenges in Bilingual Programming

While there are many benefits inherent to bilingual programming and their applications to the New Standards, there are some clear challenges that bilingual programs face that operate at federal, state, district, and school levels. One enduring challenge is the prevailing folk notion in most regions of the U.S. that literacy and content learning in a language other than English is simply time spent *not* learning English. Such English-only perspectives have been foisted on state-level educational systems in recent years, and have made the implementation of bilingual programs particularly challenging in some states. Still, bilingual education programs do exist in many states, and here we characterize the challenges of ensuring quality implementation of the New Standards across three domains: assessment, teacher training, and curriculum and materials development.

Assessment. Assessment paradigms are troublesome in the realm of bilingualism, as the challenge to aligning standards to actual test items is compounded when two languages are candidates for the medium of assessment (see Bailey & Wolf, 2012). A good deal of research has uncovered the problematic issues of construct irrelevance with respect to bilingualism and testing, such that issues of language and culture obscure the basic constructs that are presumably being assessed. These issues are crucial when developing assessment items (Solano-Flores & Nelson-Barber, 2001) and evaluating student responses to assessments in the content areas (Luykx et al., 2007; Martiniello, 2008, 2009; Penfield & Lee, 2010). Failure to attend to both cultural and construct validity across the assessment process will invariably result in construct-irrelevant variance in which a student's score likely underestimates his or her knowledge of the construct being assessed (Solano-Flores & Nelson-Barber, 2001).

Abedi and Liquanti (2012) suggest that one way in which to reduce such construct-irrelevant invariance is to provide native language versions of tests, whether they are exclusively in the L1 or in side-by-side assessments with bilingual glossaries. Abedi and Liquanti (2012) also suggest that L1 assessments are most useful for students in bilingual programs who possess low English proficiency. However, it might also be argued that children who have been instructed in two languages, irrespective of English language proficiency, would benefit from having choice of assessment language, even at the item level. This notion of a side-by-side assessment option is clearly problematic, as assessments across languages cannot be made parallel through simple translation. Be that as it may, with the implementation of the New Standards, we have an opportunity to address, support, and validate bilingual assessments, assessments given in the first language that are aligned to the New Standards, and alternative assessments in L2 for English learners at different proficiency levels that will allow them to demonstrate mastery of the Standards themselves.

Teacher Training. Despite the potential affordances of quality instructional programs that promote bilingualism, the New Standards also pose challenges that need to be considered when preparing teachers for bilingual education programs. Research has suggested that successful teachers of bilingual learners need knowledge of the students, the content, the language, and effective practices. They also must understand and have experienced second language learning and have positive attitudes toward bilingual learners (Clayton, 2008; Lucas & Villegas, 2011). The New Standards pose additional demands. Well-prepared teachers need to demonstrate knowledge of the language of instruction to levels consistent with the demands of the literacy and content standards. They need to be prepared to support students when analyzing and producing texts of increasing cognitive and linguistic demand. They need to use the language of the content areas to support historical, mathematical, or scientific conversations, as well as understand and produce texts in these content areas.

Curriculum and Materials Development. Curricula and materials in both languages must foster and support the demands made by the New Standards. Coleman and Pimentel (2011) propose a series of criteria for materials to align with the New Standards. They recommend high-quality texts that provide a range in complexity. These texts should include high-quality text-dependent questions and tasks that support development of academic vocabulary. These materials should promote analysis of texts to provide evidence for argumentation and should support informational and argumentative writing, as well as the production of research projects. They should encourage engagement in academic discussions, coverage of grammar and language conventions, and the use of multimedia and technology. For bilingual education programs, this means that the materials in both languages must follow these criteria. This is a serious challenge, especially for materials in the languages other than English.

Concluding Thoughts

Bilingual education and bilingual educators have an opportunity to play an important role in the context of the New Standards because these programs and their teachers have always had at the core of their instruction language and literacy development, including academic language to function in various curricular areas. In turn, the New Standards can positively influence these programs and educators by stressing that content acquisition is as important as language acquisition.

Bilingual education that is high quality and that promotes full development of two languages goes beyond just leveraging the native language of students in service of better English. It provides an ideal and desirable context to promote the demands of content and language learning of the New Standards by allowing students to use all their language and cultural resources. Finally, bilingual schooling prepares individuals to function in a global society, which has become a cornerstone of education in the twenty-first century.

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Opportunities for Policy Advancement for ELLs Created by the New Standards Movement

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Introduction

ELLs are the fastest-growing segment of the school-aged population. While ELLs constitute more than ten percent of the nation's total public school population, ELL student enrollment has increased at nearly seven times the rate of total student enrollment.[1] No educational reform will be successful if this subgroup of students is left behind. Despite the great need to serve this large and growing population of students, key elements of the education system are not serving it well (i.e. lack of access to rigorous curricula, appropriate assessments, or effective parent engagement). Because academic standards are the backbone of the entire educational system, raising standards to ensure college and career readiness is a critical step to ensuring that all students receive a high quality education.

The state-led voluntary effort to establish a set of higher, internationally-benchmarked Common Core State Standards (and the corollary effort in the next generation science standards hereafter collectively referred to as "the new standards") present an opportunity to improve the educational elements to support successful ELL student outcomes. The new standards, coming on the heels of a series of standards-based initiatives triggered by A Nation at Risk[2], represent a seismic shift for ELLs because of the prominent role that language plays in them.[3] The new standards framework has risen to the top in importance in policy as other avenues for ensuring accountability, high expectations, and supports for ELLs are losing ground. The issues raised at this conference will form an important core piece of the theory and knowledge undergirding this effort.

We take as our starting point the macro-message that results from the deliberations of this conference:

- **Rich language is a necessary part of all good classrooms, and it is increasingly so with the new standards.**

A corollary policy message is this:

- **Creating language-rich classrooms is a complex endeavor that requires a comprehensive approach that reforms all components of the educational system.**

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[1] Office of English Language Acquisition, Language Enhancement, and Academic Achievement for Limited English Proficient Students. The Growing Numbers of Limited English Proficient Students: 1995/96-2005/06. U.S. Department of Education. Washington, DC, 2007.

[2] National Commission on Excellence in Education (1983). A nation at risk: The imperative for educational reform. Washington, DC: U. S. Government Printing Office.

[3] For a brief historical account, see Hakuta, K. (2011). Educating language minority students and affirming their equal rights: Research and practical perspectives. *Educational Researcher 40*(4): 163-174.

A short version of the message would be: **"It's the language, stupid!"**

Once acknowledged, the ubiquitous nature of language in many of the new standards' demanding shifts will lead to the realization that ELLs face major challenges, but also that many of the challenges of language are shared by all students in engaging with rich academic content. From the perspective of the enforcement of civil rights laws, this theoretical understanding can, through Castaneda[4], ask deeper questions about the *quality* of the language to which ELLs are exposed, and in particular about the kinds of language that are integrally embedded in the new standards. Implementation questions can be raised around teacher efficacy, appropriate materials, and appropriate assessment of the full range of language and content proficiency that are up to the new standards. A critical question to be raised is how correspondence between the ELP standards and the CCSS standards are addressed by states.

A systemic response that is appropriate to the needs of ELLs, as shaped by the current discussions around CCSS, provides a framework not just in civil rights enforcement, but in federal laws and policies as well.

Policy Landscape

The era of No Child Left Behind (NCLB) is ending and the era of state flexibility is beginning. While the NCLB law still exists because Congress has not yet completed the reauthorization of it, other efforts are changing federal policy rapidly. Race to the Top is infusing funds into states to activate key reforms ahead of any Elementary Secondary Education Act (ESEA) reauthorization. At the same time, the U.S. Department of Education is approving flexibility waivers of key NCLB requirements for States in exchange for implementing certain reforms. In addition, the Congressional proposals to reauthorize ESEA that are moving through the House and Senate all do away with many of the current NCLB requirements and give States much more latitude in how federal funds are used. This is a profound shift in federal policy that will likely dominate the politics and implementation of education reform for the foreseeable future.

Although the U.S. Senate Health, Education, Labor and Pensions Committee passed a comprehensive bipartisan ESEA reauthorization bill and the U.S. House of Representatives Education and the Workforce Committee passed a partisan bill on reauthorization, Congress has not come to an agreement on the basic foundation for a reauthorization that would fully support ELLs. However,
the policies in the Senate and House Committee bills are worrisome.

The Senate Committee bill would take away many of the accountability mechanisms that would require schools to focus interventions on all schools and all subgroups that do not make required academic achievement (referred to as adequate yearly progress under NCLB), including ELLs. The Senate approach would limit accountability largely to the lowest performing five percent of schools in a state, jeopardizing the concentration on achievement of struggling students in other schools. Subgroups of ELLs in schools outside of the bottom five percent of

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[4] The Equal Educational Opportunities Act of 1981 as interpreted by the fifth circuit court under Castaneda v. Pickard clearly states that services must meet the following standards to be deemed "appropriate" for ELLs: (1) they must be based on sound educational theory; (2) there must be adequate implementation of the program based on the theory; and (3) programs must be evaluated after a period of implementation to determine effectiveness. These so-called "Castaneda" standards have been adopted by the Office for Civil Rights in its investigation of claims for ELLs. In this context, explicit theory- and practice-based accounts of ELL-specific needs in meeting CCSS would provide a valuable tool for civil rights enforcement.

schools in a state would likely not receive anything close to the level of supports and interventions presently required under NCLB.

Meanwhile in the House, the Committee bill does away with not only accountability including subgroup accountability, but also Title III and other targeted supports for students. ESEA, the hallmark of accountability and ensuring that no child, including ELLs, goes uncounted, untested or unnoticed is being threatened.

Due to Congress's inaction to finalize a bill to reauthorize ESEA, U.S. Secretary Duncan announced on August 5, 2011 that he would override the requirement that 100% of students be proficient in math and reading by 2014 for states the administration believes are carrying out ambitious school improvement initiatives.[5] Duncan and Melody Barnes, Director of the White House Domestic Policy Council, jointly announced that in order to qualify for a waiver, a state would have to demonstrate that they are carrying out the following:

- Adopting higher standards to ensure "college- and career-readiness" among students;

- Working to improve teacher effectiveness and evaluation systems based on student performance;

- Turning around the lowest-performing schools; and

- Adopting locally designed school accountability systems to replace the current accountability system under NCLB.

Additionally, the flexibility guidelines issued by the department requires states to "committing to adopt English language proficiency (ELP) standards that correspond to its college- and career-ready standards and that reflect the academic language skills necessary to access and meet the new college- and career-ready standards, and committing to develop and administer aligned ELP assessments."[6]

The first three requirements are consistent with the Obama administration's education reform priorities as outlined in Race to the Top, the first of which can be met by adopting Common Core State Standards. The fourth requirement, however, is new and would mark a major departure from the last 10 years of federal education policy. Each state is developing drastically different accountability system from other states. The first round of approved state waivers have proven that this is the case and in fact, many of the approved accountability systems have been viewed as confusing and difficult to comprehend. Some of these complicated accountability systems pose a threat to the progress made in the last reauthorization of ESEA by masking the true performance of subgroups in creating "super subgroups."

These super subgroups, in at least seven of the first eleven state waiver applications, are largely a focus by states to bring interventions and supports aimed at the lowest performing students in a school (e.g. the lowest 25 percent).[7] Rather than focus on individual subgroups of

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[5] The New York Times, Overriding a Key Education Law, August 8, 2011, accessed August 8, 2011. http://www.nytimes.com/2011/08/08/education/08educ.html

[6] ESEA Flexibility. U.S. Department of Education, September 23, 2011.

[7] Center on Education Policy. Major Accountability Themes of Approved State Applications for NCLB Waivers. Updated February 27, 2012.

students, these states are seeking to limit their accountability focus to these super subgroups. While this focus on the lowest achieving students is important, it is a significant departure from NCLB's subgroup focus. NCLB's emphasis on subgroups has arguably brought greater attention to the achievement of ELLs than this concept of super subgroups is likely to accomplish.

This is a troubling and challenging time for education policy and particularly for groups that need additional supports such as ELLs. Without federal requirements for strong accountability for results, including subgroup accountability, ELLs are at risk of being left behind or taught to lower expectations. This is not a standard that we should accept.

It is critical to note that ignoring differences in needs between ELLs and other low-achieving subgroups of students violates the unanimous U.S. Supreme Court ruling Lau v. Nichols (1974), which affirmed the rights of limited English proficient students to tailored services, and decided that merely providing the same services without tailoring made a "mockery" of the goals of equal public education under the Civil Rights Act.

The CCSS initiative offers the current best hope despite the wrong direction that waivers and ESEA reauthorization is headed, to ensure that there are high expectations for all students including ELLs and that they graduate college and career ready. Explicitly addressing how appropriate education tailored to the needs of ELLs can be delivered in the context of CCSS is an essential step in the process. But adopting the standards and aligned assessments is not enough – the implementation of CCSS is the key to that success. Effective implementation of CCSS must include strong policies in every state in order to ensure that the standards are effectively implemented in every school in order to ensure every ELL succeeds.

Critical Policy Levers for Effective Implementation of CCSS for ELLs

As states implement the CCSS initiative, policy-makers must ensure that all students are provided the educational supports and resources necessary to meet the new higher standards. Policy-makers must adopt the following recommendations so that the initiative fulfills its promise to improve education for ELL students:

- **Ensure alignment of all key components of the state system with CCSS.**

Curriculum, instructional materials, teacher preparation and professional development systems, and assessments used to support and measure student performance must be aligned with the Common Core State Standards to ensure that students are not only taught to higher expectations but also appropriately assessed for their learning. Alignment and proper assessment is especially important for ELLs to ensure that they are learning both academic content and language. The state English language proficiency standards must also be *meaningfully* aligned ("correspond")[8] to the CCSS in order to support effective instruction to develop the English proficiency of students.

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http://www.cep-dc.org/cfcontent_file.cfm?Attachment=Riddle%5FPaper%5FWaiverApp%5F022712%2Epdf
Accessed March 5, 2012.
[8] The US Department of Education in its recent memos have introduced the term "correspond" to refer to the alignment between content and English language proficiency standards (Federal Register reference for EAG; ESEA Flexibility memorandum).This is not a technical term with a clear operational definition and therefore may present a key policy opportunity for the field to create a definition that can advance policy. See paper by Bailey and Wolf.

- **Develop and implement valid and reliable assessments for all students.**

Policy-makers should ensure that academic content assessments being developed by PARCC and SBAC align strategically to the expanded language demands inherent in the new standards, drawing upon the analyses of the demands of the specific content areas emerging from this conference (see papers x, y, z). Additionally, policymakers need to ensure that the state English language proficiency standards and aligned assessments include the language functions necessary to engage with the content instruction of the content areas.

- **Move toward an assessment and accountability system that weighs and includes performance on English language proficiency and academic assessments.**

When CCSS are fully implemented, they will be meaningless for ELLs unless both language proficiency and academic performance can be combined within rigorous performance standards. The work of this group is critical to defining what high-level English proficiency and academic performance expectation can and should look like for ELL students.

- **Ensure that all teachers are provided with preservice preparation and professional development to effectively teach ELLs.**

Policymakers and administrators must embrace policies that prepare all teachers to address the needs of ELLs by supporting efforts to engage students in the practices of each content area and efforts to build discipline-specific language competencies (see Darling-Hammond and Santos paper).

- **Implement effective parent and community engagement strategies.**

Schools serving low-income students of color often do not have established, effective, ongoing communication and engagement with parents. Federal law requires school districts to disseminate critical information to parents, including school and student performance data. However, parents' understanding of this data, especially parents of ELLs, is often limited by factors including language barriers and overly complicated reporting formats. Consequently, parents do not have the requisite information needed to hold their schools accountable for providing high-quality instruction. The adoption and implementation of the new standards presents an opportunity to involve all interested stakeholders, including parents and community members. Because Latina/o students are concentrated in low performing schools that will be required to raise standards, states and districts should provide information to parents and communities concerning the implications of higher standards in a language and format they understand and which encourages their involvement and support.

Conclusion

The current policy environment is inhospitable to the improvement of educational prospects for ELLs. Yet the wave of reform unleashed by the new standards offers opportunities for better policies that would benefit ELLs because of an amplified focus on language. The policy, practice and research communities concerned with ELLs must emerge with a clear and coherent consensus on the aspects of the CCSS that advance educational prospects for ELLs, to help define what is appropriate and well-tailored to the needs of the range of ELL students.

Understanding Language | Language, Literacy, and Learning in the Content Areas

Online Community for Teachers of English Language Learners

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Overview

This report provides recommendations for developing an online community for the *Understanding Language* (UL) initiative. These recommendations are based on published research into online communities, on practical experience working with similar projects, and on conversations with the leaders of UL. The goal and value of such a community would be to provide additional opportunities for educators to come together around and contribute to the UL initiative in its efforts to improve education for all students.

Centrally, we recommend that the project take the approach of *cultivating* community among educators rather than attempting to plan all its features in advance. Once the UL working groups develop an initial set of resources for the website, the project should convene discussions among potential community members and staff, developing a set of shared goals and activities for the community. What could an online community do that would supplement or extend the resources and further the goals of UL? The goals and activities should be motivating to potential community members, and by working toward them, members should both learn and make a contribution.

Technology development should begin with a few flexible tools such as listservs, but in general, it should serve community goals and grow as the expressed needs of the community grow. What tools would help advance the community's work? Throughout this process, staff members cultivating community and monitoring its health should do so along four dimensions: *remuneration*, *influence*, *belonging*, and *significance* (Howard, 2010).

What is a Community?

The word *community* can be used in a variety of often conflicting ways (Grossman, Wineburg, & Woolworth, 2001), and likewise *online community* may call to mind different images for different people. Some use it to refer to any social elements on the web, including limited forms of participation like comment sections below news articles. Others may think of social networks like Facebook as online communities. In the scholarship on the subject however, *community* refers to something more coherent – not a web of linked profiles but a "collective whole" (Barab and Duffy, 2000) with, if not sharp boundaries, then at least a center and periphery. By Barab and Duffy's definition, a community has a shared cosmology, joint goals, and a significant history, and it is constantly reproducing itself. It may be an overstatement to say that this project aspires to define a cosmology. Nevertheless, the point is not to quibble over definitions but to agree that the goal of UL is to create and extend a shared set of beliefs and resources. Thus, the community we discuss here is of the stronger sort.[1]

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[1] Short of developing this sort of strong community, the initiative can take limited steps– such as putting comment sections below resources, moderating them, and offering professional development courses– but to smaller effect. These are unlikely to develop into an enduring, self-perpetuating community.

Cultivating Community?

The UL steering committee and working groups have spent many hours discussing and building consensus about central ideas for the initiative. They continue to work at developing sample resources. These will set the tone for any community that arises. But if these are to be taken up in by the community in a meaningful way, they cannot be imposed from above, and although foresight is beneficial, the community cannot planned in advance. That is, the community is built among members engaged in implementing the ideas in their practice, discussing them, and developing a shared sense of what they can do together to advance the shared goals of the community and project. Instead of design or planning, Wenger, McDermott, and Snyder (2002) suggest that a more appropriate metaphor is *cultivation*. In cultivating online community, UL can plant seeds, water the ones that take, watch for unexpected shoots, weed out bad ideas, and nurture the good ones.

This basic point about not over-planning is seconded by other educational researchers, who have converged on the idea that development of online learning communities should "not begin with the virtual environment but with locating existing functioning groups and determining how to best use technological infrastructures to support their continued growth" (Barab, Kling, and Gray, 2004, p. 9; Kling and Courtright, 2004; Schlager and Fusco, 2004). UL can profit from this insight in several ways. First, if we attempt to design tools and structures for a community that does not yet exist, they will likely go unused. We should allow that larger community to take shape, facilitating its development, whether in the setting of goals or facing the challenges of implementation. The project should then invest in developing tools and community that support its pursuit of those goals. Second, UL plans to build on professional development provided in schools and should work to support these existing communities and knit them together into a larger one.

Basic Recommendations

At the moment, the project's priority is to develop a consensus among working groups and to develop resources. Online community is a lower priority, and as noted above it would be difficult to plan in advance, even more so with other elements in flux. During this time, the project should choose technologies that can be expanded for community when the time comes, such as the Drupal content management system already in use for the UL website. We should also begin to build mailing lists of collaborators and interested parties. Once the working groups have settled on core ideas and are nearing completion of a set of resources for the website, UL should build basic tools to facilitate conversation, especially one or more listservs. Using these tools, project staff should convene prospective community members (professional developers or teachers using the resources) and facilitate a discussion about the existing resources and what a community might do to extend them. As the community converges on a set of shared goals and activities, the project can allocate funds for whatever sorts of technology or organizational development will further them. It is difficult to say now what those projects might be, and to do so would be to short circuit necessary conversations. Thus, the remainder of this document does not provide a blueprint for community but ideas for cultivating it.

Community Member Experience: The RIBS Framework

As the community develops and works towards goals, staff members should monitor its health and respond accordingly. According to Howard's (2010) "RIBS Heuristic," community health can gauged in terms of four dimensions members' feelings: remuneration, influence, belonging, and

significance. Below, we briefly describe the four points of the heuristic and provide practical suggestions for fostering them. These have been culled mostly from Howard except where otherwise noted, but we have selected points and presented them so as to be most helpful to UL. These do not represent a step-by-step plan. Rather, when the time comes to start a community, project staff can choose from and adapt these ideas to fit the situation. Staff may also refer directly to Howard's text, which is sound, accessible, and useful.

Remuneration

Simply put, remuneration is defined as the benefit members receive from being part of a group. This may include knowledge transfer or even outright payment, but Howard (2010) emphasizes that "the key to long-term success is remembering that the most important remuneration you have to offer is the *experience* of socially constructing meaning" (43). UL could provide members with several forms of remuneration:

- Resources to use in the classroom.
- Advice from skilled, like-minded practitioners.
- Learning about linguistic approaches to content in a more transformative way.
- Positive experiences and recognition in interaction with community members.

Practical Suggestions for Remuneration

Seed the discussion. Ask pressing, relevant questions to provoke lively discussions. Keep the tone civil but allow some conflict, which encourages readership and participation. This is a fine line to walk, and controversy will be more acceptable on some topics than others. Encourage disagreement where it seems constructive and likely to draw people into the conversation.

Hire contributors. To seed and sustain discussion, it is sometimes necessary to hire contributors. If possible, participants in professional development should be remunerated in ways other than cash payment. If people feel they are receiving payment in direct exchange for their work, they may be less likely to continue participating once the incentive is removed. In lieu of payment, we might provide professional development credit, resources for their classroom, meals, support, etc.

Have regular events. The UL webinar series is a good start toward a consistent monthly event to create familiarity, and provoke discussion. We could also send organization emails on the same day every week or designate a day to share successes, for example, or a "Friday Fun Day" as a break from more serious discussion.

Promote mentorship. To convert new members into real contributors, rather than becoming mere "lurkers," UL can ask experienced members to mentor new ones. A new member would be assigned a mentor who would send them occasional private messages over the first 30 days, demystifying the activities of the community, building a personal connection, and encouraging the new member to contribute.

Influence

Members of the community should feel like they have some influence over its direction. In this regard, UL faces a challenge, given that the project will largely be driven by experts on language and the subject areas. When community development begins, the project should

carve out opportunities for members to exercise voice. For example, teachers who have used our materials are especially well-positioned to identify shortcomings and useful next steps. This is most likely to be effective if they are treated (and credited) like collaborators rather than as customers or clients.

Practical Suggestions for Influence

Different needs. Community members can be categorized in several ways. In Kim's (2000) hierarchical five-level system, they are called *visitors*, *novices*, *regulars*, *leaders*, and *elders*. Other schemes label them as *creators*, *critics*, *spectators*, etc. Some types of members (generally, veterans and heavy contributors) need to feel more influence. New members are usually less concerned with influence but require more help and immediate feedback. All types of members are important, and UL should be aware of their varying needs (for more, see Howard, 2010, pp. 85-93).

Committees. Ask established contributors to serve on an advisory council or welcoming committee. The latter allows them to feel like insiders while also assisting prospective members.

Application. Ask prospective members to submit a simple application (a web form with 3 or 4 questions) stating why they would like to join and what they could contribute to the community. This establishes an expectation of contribution and helps veterans invest more time in the most committed applicants.

Occasional Surveys. Send quick surveys, which allow members to express concerns and can help address small complaints before they become larger.

"Visitor's Center." Set up a web page where prospective members can find basic information on the community, how to participate and why, as well as what opportunities are available.

Belonging
Many people participate in communities because it gives them a sense of belonging – of membership and connectedness.

Practical Suggestions for Belonging

Ceremonies. The community should create regularly recurring events, celebrating collective accomplishments and recognizing the advancement of members to new leadership roles within the group.

Initiation rituals. These can promote group solidarity through shared experience. If we offer a professional development course, it can serve as a sort of initiation ritual. If our community will include teachers from the profession at large, we should consider ways to provide them with a similar, abbreviated initiation.

Personal writing style. Community developers will need to calibrate the tone of their writing. Bacon (2009, p.82) warns community builders, "Don't write like an institution." There will be times when a press release or administrative tone will be appropriate but most communications within a community should sound personal rather than official. Err on the side of brevity and

write as if talking to someone nearby, using "I" and "you" statements, and balancing seriousness, humor, wit, frankness, and slight self-deprecation (ibid., pp. 85-87).

Organizational mythologies. Use anecdotes or stories to explain, for example, where the organization came from (an origin myth) and what it is doing (a vision story). Myths can also identify an enemy or discourage unwanted behaviors, but this sort of negative myth should be used judiciously.

Personal mythologies. A community can also encourage members to tell and share their personal stories or 'myths'. As with the testimony of an Alcoholics Anonymous member, re-narration can strengthen connection to the community, encourage desired behaviors, and encourage others to revise their own personal stories.

Visual identity. Consistent use of a logo and color scheme will help community members feel they are in a distinct place. A set of symbols could be developed, consistent with the overall look and feel, to represent member roles or levels of participation.

Significance

Members are most likely to return to a community that is recognized as a "go-to place" in its field (Howard, 2010, p. 168). UL has many advantages in establishing this reputation including its affiliation with Stanford and the involvement of numerous respected members of the field. It is worth considering though whether the people UL seeks to draw into a community, including teachers and professional developers, will recognize the names of its leaders, who may be better known in academic and administrative circles. If this is the case, UL may want to reach out to "influentials" whom the target community members will recognize, or to employ other methods for building a sense of significance.

Practical Suggestions for Significance

Vision Narrative. Stories can be used to convey the project's vision. What is the problem? What is UL's vision? How will we achieve it?

Feeling of "Specialness." Howard (2010) suggests developing significance by cultivating a certain element of exclusivity. This may be in tension with UL's goal of providing widely accessible resources. If there is also a concern that UL could be seen as an ivory tower, then exclusivity may not be the most appropriate public posture. UL should, however, make members feel that they are a part of something special. We might take advantage of some natural points of exclusivity (e.g., limited capacity in PD courses, a need to expand gradually, and of course the Stanford name), taking care to seem special but not arrogant.

Publicize Accomplishments. UL can encourage members to post biographies listing their accomplishments. By celebrating members' successes, we can recognize them while also reinforcing the sense that the community is a place for successful people.

Social Media. UL could establish a presence in social media such as blogging, Facebook, and Twitter while also reaching out to opinion makers with large social media followings.

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