Abstract Title Page

Title:
Project READI: Designing Instruction for Evidence-based Argumentation in the Disciplines

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Project READI

Abstract Body.

Introduction and Background/Context

Project READI defines reading for understanding as the capacity to engage in evidence-based argumentation from multiple text sources of information, situated within a discipline. This definition reflects what we see as central competencies needed for success in 21st century society. Yet the evidence indicates that students are graduating from high school without these skills (Carnegie Council on Advancing Adolescent Literacy, 2010; Common Core State Standards Initiative, 2010; NAEP 2009; OECD, 2004; Biancarosa & Snow, 2004). Project READI is developing interventions whose overarching goal is student attainment of reading for understanding as we have defined it. We are simultaneously engaged in design-based research to develop the intervention and basic studies of the cognitive, social, and instructional processes and practices involved in reading for understanding. We are working in three disciplines – literature, history, and science – and across grades 6 to 12 (Goldman et al., 2009).

The development of the intervention is based on a theory of change that posits that students' acquisition of knowledge, skills, and dispositions necessary for reading for understanding depends on teachers creating appropriate opportunities to learn. To create these opportunities to learn, teachers need to understand the what, why, and how of instruction that supports reading for understanding, including tasks, text sets, instructional practices and assessments. The Project READI intervention therefore includes (1) the development of exemplar instruction in the form of Evidence – Based Argumentation Instructional Modules (E-BAIMs) that can be used in classrooms, and (2) teacher professional development focused on deep analysis of the E-BAIMs and implementations of them, thereby providing teachers with opportunities to develop the expertise needed to implement and adapt modules.

Developing E-BAIMs is the work of design teams comprised of content specialists, teachers, educational researchers, and instructional developers. Development proceeds in iterative cycles of design-implementation-reflection-redesign. Teacher professional development occurs in the context of Teacher Network meetings.

Purpose / Objective / Research Question / Focus of Study:

In this symposium we report on lessons learned through design-based research regarding important features of the design and implementation of components of the E-BAIMs. Specifically, for the past two years, we have been working as three design teams – one for each disciplinary area - to construct initial versions of E-BAIMs that are tested iteratively in classrooms of teachers who are members of the design teams. The overarching research question is whether the intended outcomes of particular aspects of the design, as well as of the module overall, were achieved. More specifically:

- To what extent were students engaged by the tasks and texts and showed evidence of learning?
- To what extent were the designs of E-BAIMs supporting student dispositions (e.g., persistence, self-regulation) to engage in academic reading?
- To what extent did teachers find the E-BAIMs feasible and useful?

- What modifications, improvements, and redesigns were suggested by teachers' and students' enactments of the E-BAIMs?

Although not a major focus of this presentation, the design of the E-BAIMs is being influenced by basic studies on components of the designs. Likewise, the results of implementing the modules are raising questions that are taken up in basic studies.

Initial designs of the E-BAIMs in each of the disciplines incorporated the same set of 14 principles based on extant findings regarding reading and learning in literature, history, and science (e.g., Bransford, Brown, & Cocking, 2000; Goldman & Bisanz, 2002; Goldman, 2005; Goldman, et al., 2009; Greenleaf, et al., 2011; Langer, 2010; Lee, 2011; Lee & Spratley, 2010; Pellegrino, Chudowsky, & Glaser, 2001;Shanahan & Shanahan, 2008; Wineburg, 2001). In synthesizing the research, we developed a broad framework that specified five categories of knowledge that constitute a model of the competent reader in each discipline: epistemology; inquiry practices/ways of reasoning; overarching concepts, themes, frameworks, big ideas; information representations/types of texts; and discourse practices/language structures. Table 1 provides brief definitions of each of these (please insert Table 1 here). Although the categories apply to each discipline, their instantiation constitutes distinct reading models in each discipline.

The design of the E-BAIMs is intended to engage students in addressing a problem, driving question, or issue that necessitates close reading of a set of texts typical of the discipline using inquiry strategies and involving understanding key concepts and principles of the discipline. Gateway and cultural modeling activities (Lee, 2007) are included in the modules to draw on the knowledge students bring to the classroom. Students engage one another in cognitive and metacognitive exchanges that support sense making and use of evidence to support claims. Teachers model ways of reading and analyzing texts as appropriate to the discipline. Various templates support synthesis and argumentation in oral and written modes. With each implementation we administered pre-post assessments on a different but related topic for history and science or using different literary works than those used in instruction. To date, we have implemented E-BAIMs in two topic areas within each of the three disciplinary areas in multiple grades (please insert Table 2 here). The specific topics and numbers of classrooms per grade span are provided in Table 2. For each designed module, we developed an analysis of the rationale and intended outcome of its inclusion with respect to development of specific content knowledge, core knowledge constructs, processes, or skills. For example, what texts were included in what sequence and why those texts and ordering.

Setting and Population. E-BAIMs implementations have been conducted in classrooms in urban and exurban public or publicly-supported charter schools serving children from diverse backgrounds. Each classroom implementation shown in Table 2 reflects one teacher and a class of between 15 – 25 students. The teachers participated in the collaborative design of the modules that they implemented.

Research Design

Method. Design-based research methodology was employed in studying each implementation, with each classroom constituting a case (Cobb, Confrey, diSessa, Lehrer, & Schauble, 2003; Yin, 2006). Two researchers were present each day of the implementations, taking field notes and videotaping. Interviews and debriefings were conducted with teachers on a daily basis. We intentionally designed the first and second iterations in science and history to occur over approximately 10 to 12, 50-minute class periods. The literature designs were intended to occur over 20 to 25, 50-minute class periods at the high school grade bands. The middle school literature design was intended to cover an 8-week span of instruction during the 90 - minute literacy block.

Data Sources and Analytic Strategies. The implementations were documented via field notes, videotapes of the classroom implementations, interviews and debriefings with the teachers, interviews with students, and student artifacts produced as part of the E-BAIMs.

Qualitative analyses of field notes, interviews, and analytic memos along with qualitative and quantitative analyses of the pre/post assessments and student artifacts over the course of the module were used to inform the fundamental research questions. We used the videos to more closely examine the implementation process itself. We segmented videos to focus on instructional episodes and coded for the focus of instruction: building prior knowledge of topics through gateway activities; prior knowledge of strategies through cultural data sets; supports for close reading; supports for and engagement in argumentation; argumentation as oral discourse and written argumentation, including claims – evidence – reasoning segments. We examined both dosage (amount of time) and quality of implementation of the design.

Findings: Lessons Learned

In this presentation we focus on what we have learned specifically in one disciplinary area, literature. Lessons learned from the first iteration informed redesign of specific elements in the second iteration. The lessons learned and redesign efforts were similar in history and science.

First iteration pre-post test essays and student text annotations and written artifacts were analyzed with respect to several skills targeted in the intervention, including (a) making claims about the themes and the meaning of symbols in the stories, (b) providing evidence from the texts for those claims, (c) using literary reasoning strategies to connect claims and evidence, (d) comparisons and contrasts across texts. These analyses indicated increases in noticing symbols and stating claims and some increase in citing information from the texts but a lack of reasoning that connected the information from the text to the claims. There was little evidence of comparison or contrast across stories. The analyses of the video from the interventions indicated that while students learned to employ heuristics for rejecting the literal and inferring the symbolic, there was little attention to the ways in which symbolic language shaped theme. As a consequence the focus on claims and evidence about themes in the stories tended to rest on appeals to personal experience, but not on the functions of rhetorical choices by authors. In addition, there was little instructional support for cross-text comparisons. Furthermore, teachers were short-circuiting close reading of the texts, in an effort as they reported "to get to the symbolism and thematic interpretations." There were also insufficient supports in the instruction for writing arguments.

The findings from the first iteration led to some significant changes in the design of the second literature module, which was focused on unreliable narration. In the second design iteration, more instructional time was devoted to participation structures in which students took the lead in carrying out the problem solving work involved in interpreting literary works. This included systematic use of tools available in the E-BAIMs for close reading (e.g., annotation, prompts to guide the use of graphic organizers to keep track of plot, characters, and unusual events or things that were surprising or unexpected). Teachers redoubled their efforts to support students in close *reading* of the literary texts; they intentionally spent less time reading *to* students. Scaffolds in the form of sentence frames for argumentation were introduced to acquaint students with ways in which they could "word" their written claims and evidence, and use reasoning to relate the two.

Similar issues were observed in the history and science implementations and similar modifications were made. For example, often at the first sign of students struggling with text, teachers tended to "jump in" and do the reading for the student or state the important points. Modifications to the instructional designs emphasize close reading for event chronology and explanatory models (history) or for causal chains from factors to outcomes (science) and provide graphic organizers to assist each.

Conclusions and Implications for Design:

Our initial rounds of design-based research enabled us to identify key areas that must be highlighted for both teachers and students. In particular, we have found that focusing teachers on assessing "who is doing the intellectual work?" during class helps them retain an explicit focus on supporting students to engage closely with texts – and to struggle to understand them. Other scaffolds such as sentence frames provide a useful toolkit for teachers to assist students comparing and contrasting across texts and expressing their comprehension and reasoning in written argument form. The results of our design-based research indicate several areas that we are pursuing in the development of the modules. We are (a) placing greater emphasis on specifying learning objectives and mechanisms for teachers to assess these during the course of a module, (b) developing "spotlight" lesson sequences that target specific elements in modules (e.g., developing criteria for judging the quality of arguments, close reading for event chronology), (c) expanding the topics of modules, (d) pursuing ways to introduce core knowledge constructs and then deepen them over successive modules, (e) developing more nuanced ways of capturing text complexity, and (f) using basic studies to explore the affordances of various task interpretation, close reading, and argumentation scaffolds. Finally, we are expanding the sample of teachers who are contributing to the design and refinements of the E-BAIMs through our teacher professional development networks.

Appendix A. References

Biancarosa, G., & Snow, C. E. (2004). *Reading Next: A vision for action and research in middle school and high school literacy: A report to Carnegie Corporation of New York*. Washington, D. C.: Alliance for Excellent Education.

Bransford, J. D., Brown, A. L., & Cocking, R. R. (Eds.) (2000). *How People Learn: Brain, Mind, Experience, and School*. Washington, DC: National Academy Press.

Carnegie Council on Advancing Adolescent Literacy (2010). *Time to act: An agenda for advancing adolescent literacy for college and career success*. New York, NY: Carnegie Corporation of New York.

Cobb, P., Confrey, J., diSessa, A., Lehrer, R., & Schauble, L. (2003). Design Experiments in Educational Research. *Educational Researcher, 32*(1), 9-13.

Council of Chief State School Officers (2010). *The Common Core Standards for English Language Arts and Literacy in History/Social Studies and Science and Technical Subjects*. Downloaded Nov., 10, 2010 from www.corestandards.org.

Goldman, S.R. (2004). Cognitive aspects of constructing meaning through and across multiple texts. In N. Shuart-Ferris & D.M. Bloome (Eds.), *Uses of intertextuality in classroom and educational research*. (pp. 313-347).Greenwich, CT: Information Age Publishing.

Goldman, S. R. (2005). Designing for scalable educational improvement. In C. Dede, J. P. Honan, & L. C. Peters (Eds.), *Scaling up success: Lessons learned from technology-based educational improvement* (pp. 67-96). San Francisco, CA: Josey Bass.

Goldman, S. R., & Bisanz, G. (2002). Toward a functional analysis of scientific genres: Implications for understanding and learning processes. In J. Otero, J. A. León, & A. C. Graesser (Eds.), *The psychology of science text comprehension*. (pp. 19-50). Mahwah, NJ: Erlbaum.

Goldman, S. R., et al. (2009). *Reading for understanding across grades 6 through 12: Evidence-based argumentation for disciplinary learning*. Funded July, 2010 by the Institute of Education Sciences, U.S. Department of Education, Grant # R305F100007.

Greenleaf, C. L., Litman, C., Hanson, T. L., Rosen, R., Boscardin, C. K., Herman, J., Schneider, S. A. (2011). Integrating literacy and science in biology: Teaching and learning impacts of Reading Apprenticeship Professional Development. American Educational Research Journal, 20, 1-71. Doi:10.3102/0002831210384839.

Heller, R., & Greenleaf, C. (2007). *Literacy instruction in the content areas*. Washington, DC: Alliance for Excellent Education.

Langer, J. A. (2010). *Literature: Literary understand and literature instruction, 2nd edition*. NY: Teachers College Press.

Lee, C. (2011). Education and the study of literature. *Scientific Study of Literature, 1*(1), 49-58.

Lee, C. D. (2007). *Culture, Literacy and Learning: Taking Bloom in the Midst of the Whirlwind*. NY: Teachers College Press.

Lee, C. D., & Spratley, A. (2010). *Reading in the disciplines: The challenges of adolescent literacy*. New York, NY: Carnegie Corporation of New York.

National Assessment of Educational Progress (2009). *NAEP 2008 Trends in Academic Progress (NCES 2009–479)*. Prepared by Rampey, B.D., Dion, G.S., and Donahue, P.L. for the National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education, Washington, D.C.

Organization for Economic Cooperation and Development (2004). *Learning for Tomorrow's World: First Results From PISA 2003*. Paris: Author.

Pellegrino, J. W., Chudowsky, N., & Glaser, R. (2001). *Knowing What Students Know: The Science and Design of Educational Assessment*. Washington, DC: National Academy Press, 2001.

Shanahan, T. & Shanahan, C. (2008). Teaching Disciplinary Literacy to Adolescents: Rethinking Content-Area Literacy. *Harvard Educational Review, 78*(1), 40-59.

Wineburg, S. (2001). *Historical Thinking and Other Unnatural Acts: Charting the Future of Teaching the Past*. Philadelphia, PA: Temple University Press.

Yin, R. K. (2006). Case study methods. In J. L. Green, G. Camilli, & P. B. Elmore, (Eds.) (2006). *Handbook of complementary methods in education research* (pp. 111- 122). Washington, D. C.: American Educational Research Association.

Appendix B. Tables and Figures

Table 1. Types of Knowledge

Core Knowledge Constructs	Brief Description
Epistemology	What counts as knowledge? How do we know what we know? Beliefs, values, and commitments that the reader draws upon to prioritize and warrant claims based on ...a conception of the terrain of literature;…the nature of science; the nature of history
Inquiry practices/ways of reasoning	Practices of reading and reasoning when doing historical, scientific, or literary inquiry. Practices of developing interpretations, explanations, and arguments.
Overarching Concepts, themes, frameworks, big ideas	Major unifying ideas and frameworks within a discipline
Information Representations/Types of texts	Various forms in which disciplinary information is conveyed
Discourse and Language Structures	Communication practices and structures established by a discipline

Table 2. Implementations of E-BAIMs during October, 2011 to May, 2012

Discipline & Topic	Number of Classes per Grade Span		
Science:	6-8	9/10	11/12
MRSA (adaptation)		2	
Human impacts on water purity	1		
History:			
U.S. expansion and conflict with Native Americans	1		1
Little Rock Nine & Civil Rights Era	1	1	1
Literary Texts:			
Modules on the theme of coming of age and understanding symbolism	1	2	1
Various themes with stories that involve unreliable narration	1	2	1