The Power of Questions to Bring Balance to the Curriculum in the Age of New Standards

Pixita del Prado Hill, SUNY Buffalo State
Susan E. McMillen, SUNY Buffalo State
Ellen S. Friedland, SUNY Buffalo State

ABSTRACT: The Common Core State Standards (CCSS); the Next Generation Science Standards (NGSS); and the College, Career, and Civic Life (C3) Framework for Social State Standards are bringing many changes to schools and classrooms across the United States. This article suggests using the power of questions to make connections across seemingly disparate disciplinary goals to help bring greater balance, coherence and meaning to the academic lives of teachers, students, and parents. The paper begins with a rationale for using guiding questions within the context of PDS and then includes an example, tools and suggestions for professional development with PDS stakeholders.

NAPDS Essentials Addressed: This paper aligns with Essential 3: Ongoing and reciprocal professional development for all participants guided by need.

The New Standards

Schools and classrooms are undergoing great change as a result of new national standards. Published in 2010, the Common Core State Standards (CCSS) for mathematics and English Language Arts and Literacy have been adopted by the majority of states. Released in 2013, the Next Generation Science Standards (NGSS) are the result of a collaborative effort among 26 states. Also disseminated in 2013, the College, Career, and Civic Life (C3) Framework for Social Studies State Standards were developed through a state-led team. The mathematics and ELA/literacy standards have received the most attention, in part because of the high stakes assessments to determine if students have met the standards (and whether teachers have adequately prepared students to meet the standards). The release of the NGSS and C3 offer hope that science and social studies will regain a stronger position, especially in the elementary and middle school curriculum where these two content areas have often been pushed aside.

The goals of all four frameworks are to move curriculum from discreet pieces of knowledge to deep and broad understandings within the discipline areas. In mathematics and ELA/literacy the standards "include rigorous content and application of knowledge through high-order skills" (Common Core State Standards Initiative, 2012b). The NGSS "include the critical thinking and communication skills that students need for postsecondary success and citizenship in a world fueled by innovations in science and technology" (Next Generation Science Standards, 2013a). For social studies the C3 "objectives are to: a) enhance the rigor of the social studies disciplines; b) build critical thinking, problem solving, and participatory skills to become engaged citizens; and c) align academic programs to the Common Core State Standards for English Language Arts and Literacy in History/Social Studies" (National Council for the Social Studies, 2013).

The standards present significant and sometimes overwhelming change for teachers, students, and parents. Reactions to national standards have been mixed, largely because of the assessments associated with the new content. In addition, the idea of a national curriculum as well as certain content in the NGSS and C3 have been controversial. Moreover, the emphasis on literacy and mathematics as noted above concerns many science and social studies educators that students will not experience a balanced curriculum.

School-university partnerships provide an important mechanism to address these challenges. Professional Development Schools (PDS) are in a unique position to bring together the various stakeholders in discussions about standards and provide opportunities for "ongoing and reciprocal professional development for all participants guided by need" (Brindley, Field, & Lessen, 2008, p. 3). An example of how PDS structures and principles can be leveraged to ensure that the new standards improve learning experiences for all students comes from the partnership between SUNY Buffalo State University and its participating schools. The SUNY Buffalo State University PDS Consortium is a collaborative effort based on three main PDS frameworks: (a) the NCATE Standards for Professional Development Schools (2001), (b) the National Association for Professional Development Schools Nine Essentials (Brindley, Field, & Lessen, 2008), and (c) the NCATE Blue Ribbon Panel Report (2010). These frameworks provide the theoretical structures to guide clinically rich practice allowing us to explore potential solutions to problems that the members of the Consortium face. This article recommends using the power of PDS partnerships to explore how questions might be used to make connections across seemingly disparate disciplinary goals in order to help bring greater balance, coherence and meaning to the academic lives of teachers, students, and parents.

Table 1. Practices in the Core Curriculum (Note: The phrasing was adapted slightly for grammatical consistency across the four discipline areas.)

Math (from the CCSS)	*English (from the CCSS)*	*Science (from the NGSS)*	*Social Studies (from the C3)*
M1 Making sense of problems and persevering in solving them. M2 Reasoning abstractly and quantitatively. M3 Constructing viable arguments and critiquing the reasoning of others. M4 Modeling with mathematics. M5 Using appropriate tools strategically. M6 Attending to precision. M7 Looking for and making use of structure. M8 Looking for and expressing regularity in repeated reasoning. (Common Core State Standards Initiative, 2012c)	E1 Demonstrating independence. E2 Building strong content knowledge. E3 Responding to the varying demands of audience, task, purpose, and discipline. E4 Comprehending as well as critiquing. E5 Valuing evidence. E6 Using technology and digital media strategically and capably. E7 Coming to understand other perspectives and cultures. (Common Core State Standards Initiative, 2012a)	S1 Asking questions (for science) and defining problems (for engineering). S2 Developing and using models. S3 Planning and carrying out investigations. S4 Analyzing and interpreting data. S5 Using mathematics, information and computer technology, and computational thinking. S6 Constructing explanations (for science) and designing solutions (for engineering). S7. Engaging in argument from evidence. S8. Obtaining, evaluating, and communicating information. (Next Generation Science Standards, 2013b)	SS1 Developing questions and planning inquiries. SS2 Applying disciplinary tools and concepts. SS3 Evaluating sources and using evidence. SS4 Communicating conclusions and taking informed action. (National Council for the Social Studies, 2013)

The Power of Questions

In 1998, Wiggins and McTighe introduced the Understanding by Design framework which featured Guiding Questions (or "doorways to understanding"). These questions aim "to stimulate thought, to provoke inquiry, and to spark more questions – including thoughtful student questions – not just pat answers" (Wiggins & McTighe, 2005, p. 106). In addition, numerous educators have built on Bloom's Taxonomy to develop meaningful questions to move students to higher order thinking on a wide range of topics (e.g., Anderson & Krathwohl, 2001). In order to teach students how to think and behave intelligently when they encounter problems and challenges in learning and in life, Costa and Kallick (2008) position questioning within a habits of mind framework.

The Pragmatism of Questions

The authors of this article are teacher educators working closely with the SUNY Buffalo State University PDS Consortium. Through our work across content areas at the elementary, middle, and high school levels, we spend a great deal of time visiting classrooms as we collaborate with our school partners in the preparation of teacher candidates and the development of practicing teachers. We have seen the frustration that teachers, children, and parents feel with regard to the standards, and this article was written with the hope of offering a way to implement the standards in meaningful and doable ways. Moreover, we are concerned about the emphasis of literacy and mathematics to the exclusion of science and social studies, particularly at the elementary and middle school levels. Ongoing interactions with our PDS partners helped us to see that the practices of the four core discipline areas shared some common attributes despite the very important differences among these fields of study. (See Table 1 for a list of the practices and their sources.)

Reflection on these common attributes led us to develop a hands-on activity that we shared with representatives from our partner schools at one of our PDS Consortium meetings. Each table was given an empty Venn diagram with one circle for each of the four sets of national standards. They also received a color-coded set of address labels with all of the standards from the four content areas. The participants then placed the stickers with the standards onto the Venn diagram, thinking about where the practices of the discipline areas overlapped. For example, all four sets of standards mention providing evidence, so the evidence stickers went into the center section of the Venn diagram. Although the final Venn diagrams were not exactly the same, all of the groups found that the main idea of almost all of the standards were included in at least two of the sets of standards. (See Figures 1a and 1b for two of the Venn diagrams completed by our PDS partners.)

Cross-Content Attributes and Developing the Guiding Questions

An analysis of the overlapping practices in the Venn diagrams led us to identify common themes or attributes that would lead

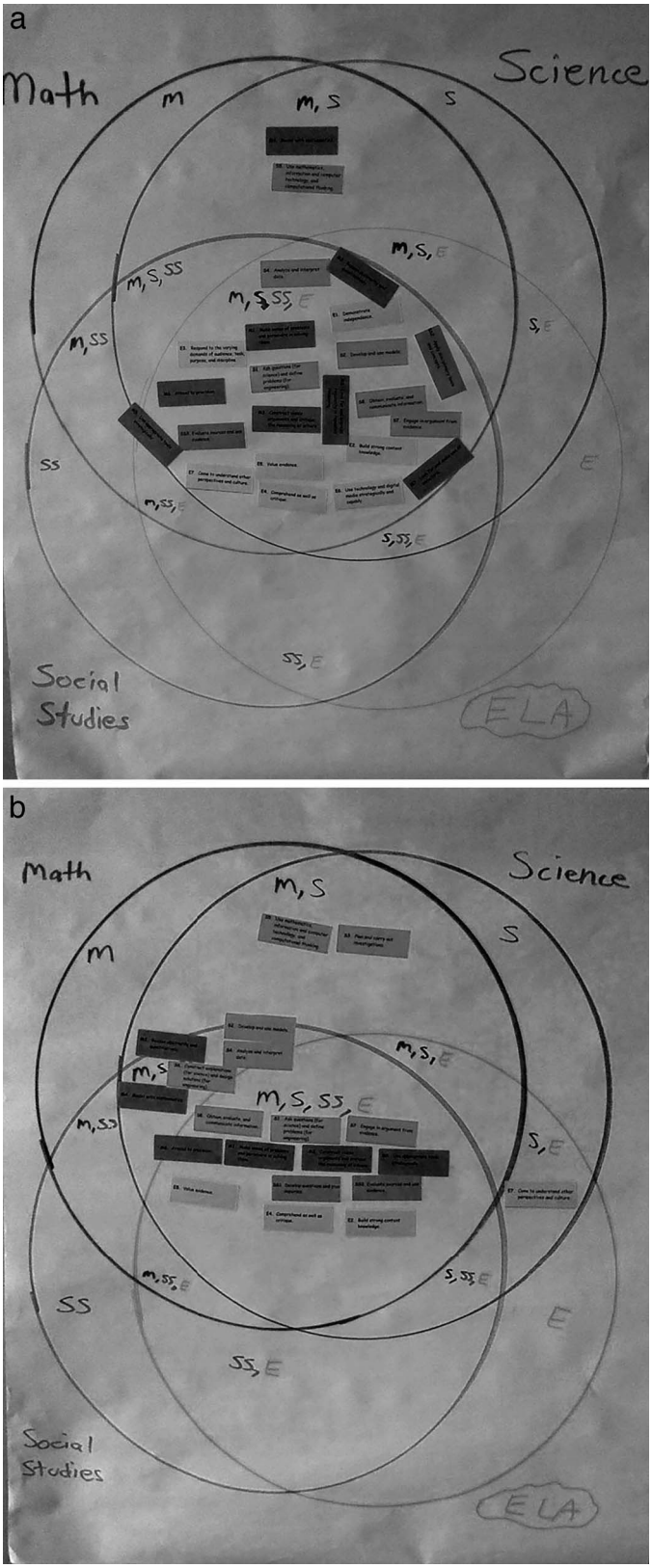

Figure 1a. Completed Venn Diagram for the Standards
Figure 1b. Completed Venn Diagram for the Standards

to student success with the four disciplinary sets of standards. For example, the theme of identifying and providing appropriate evidence is reflected across all four disciplines in the following practices: 1) mathematics: M3 - Constructing viable arguments and critique the reasoning of others, 2) ELA: E5 - Valuing evidence, 3) science: S7 Engaging in argument from evidence, and 4) social studies: SS3 - Evaluating sources and using evidence. (See Table 2 for additional examples.)

We identified 11 common attributes: accuracy, communication, evaluating sources, evidence, models, persistence, perspective, procedures, quantitative/qualitative reasoning, resources, and text. The guiding questions are designed to be useful for each specific content area and across grade levels, but also to serve as links to connect the content areas. For example, there are two guiding questions for the common attribute of providing evidence for an argument: "How do you know?" and "What proof do you have?" The eleven cross-content attributes and their corresponding guided questions are shown in Table 3.

Recommendations for Using the Cross-content Attributes and Guiding Questions

We believe that the attributes and questions are versatile tools that can be used by building leaders, teachers, students, and parents. Teacher educators will also find them useful as they help new teachers learn to plan conceptually. The following suggestions offer ideas for how the attributes and questions might be used.

- Offer professional development through PDS gatherings to discuss ways to use the attributes and questions in teacher education programs and within schools. PDS groups might be interested to try the professional development activity discussed above.
- Use the attributes and questions to develop common vocabulary across discipline areas and grade levels to build academic vocabulary.
- Use the attributes and questions to help students make connections across discipline areas (Wiggins & McTighe, 2005) and for interdisciplinary projects.
- Develop the habit of questioning (teacher to teacher, teacher to student, student to teacher, student to student) within a school building (Costa & Kallick, 2008).
- Use the attributes and questions across content area groupings for teacher planning meetings and professional development to identify where skills and knowledge can be built across disciplines.
- Use the attributes and questions within content area groupings to generate topical questions particular to the content. Be sure that questions within the discipline represent the various levels of thinking (Anderson & Krathwohl, 2001). Modify the questions to meet the needs of the student body adapting to specific grade

Table 2. Three Examples of Communicating Across the Content Areas

Cross-Content Essential Attribute and Question	*Mathematics Practices*	*ELA Practices*	*Science Practices*	*Social Studies Dimensions*
Evidence – How do you know? What proof do you have?	M3 Constructing viable arguments and critique the reasoning of others.	E5 Valuing evidence.	S7 Engaging in argument from evidence.	SS3 Evaluating sources and using evidence.
Procedures – What steps do you need to take to solve this problem?	M1 Making sense of problems and persevering in solving them.	E4 Comprehending as well as critiquing.	S3 Planning and carrying out investigations.	SS1 Developing questions and planning inquiries.
Persistence – What do you do when you get stuck? What resources can you draw on to help you continue?				
Resources – What technology/tools will best help you solve this problem?	M5 Using appropriate tools strategically.	E6 Using technology and digital media strategically and capably.	S5 Using mathematics, information and computer technology, and computational thinking.	SS2 Applying disciplinary tools and concepts.

ranges as well as to state department of education requirements.

- Modify the questions to meet different developmental levels and also address the varying needs of a district while still retaining the questions' core meaning.
- Post the attributes and questions in eye-catching ways throughout the building, on student work, and in parent/family communication to develop a school-wide common language of inquiry. Examples from a partner school are shown in Figure 2.
- Use the questions and attributes to help parents make sense of the new standards. For example, sponsor a "Questions Night" when teachers, students, and parents might gather to explore a topic/concern of importance to the school community through the lens of the various questions.

Conclusion

The new standards require that students think deeply and critically about all disciplines. We propose these cross-content attributes and guiding questions to promote an inquiry-orientation across PDS partnerships at a school-wide and district-wide level and to help teachers and students work as learners together. We believe that these questions can help prepare students for college and careers where they must draw

Table 3. Cross-Content Attributes and Questions

Attribute	*Questions*
Text	What does the text tell you? What doesn't it tell you? What can you infer?
Perspective	Whose point of view is present in the information? What potential bias is present in the information?
Evaluating sources	Can you trust this source? Can you trust this process?
Evidence	How do you know? What proof do you have?
Models	What patterns do you see (that you can apply to a new problems)?
Quantitative/Qualitative reasoning	When do numbers help you understand and solve a problem? When do words help you understand and solve a problem?
Communication	Who is your audience for this problem? How should you structure your work to inform that audience?
Accuracy	How accurate do you need to be for this problem? How can you be sure your work is accurate?
Procedures	What steps do you need to take to solve this problem?
Resources	What technology/tools will best help you solve this problem?
Persistence	What do you do when you get stuck? What resources can you draw on to help you continue?

Note. For the purposes of developing a common language to increase communication and understanding, it should be noted that we define *problem* as ''challenge,'' or ''assignment,'' or ''task.'' And, we define *text* as anything that conveys meaning including words, numbers, visuals, and other media.

Figure 2. Academic Vocabulary (''Evidence'') Posters From a PDS Partner School

from across the disciplines to solve complex problems. Finally, we also hope they will result in greater attention, emphasis and exploration of both science and social studies to help guide the development of well-educated citizens. SUP

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Dr. Pixita del Prado Hill is a Professor at SUNY Buffalo State where she serves as the Professional Development Schools Co-director and teaches literacy and social studies methods.

Dr. Susan McMillen is a Professor at SUNY Buffalo State where she serves as the Professional Development Schools Co-director and teaches mathematics and mathematics education courses.

Dr. Ellen Friedland is an associate professor at SUNY Buffalo State where she teaches content area literacy courses.