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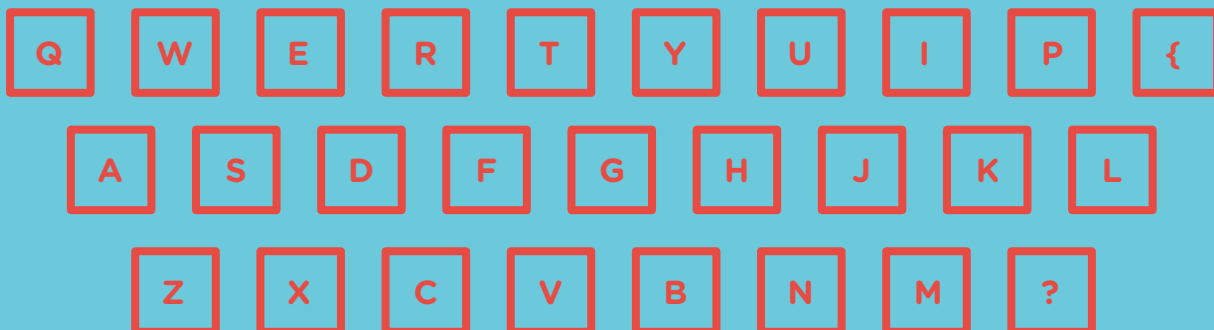
BEYOND THE RESEARCH PROJECT: INQUIRY EVERY DAY AND EVERY WAY

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Instructional collaborations between classroom teachers and school librarians often involve the "research project." These annual assignments (typically) are opportunities to put the inquiry process into practice and provide a rich context for learning. But the *National School Library Standards for Learners, School Librarians, and School Libraries* (2018) remind us that inquiry happens beyond the research project—inquiry happens every time a student uses information to answer a question, complete an assignment, or solve a problem. Moreover, inquiry will look different in the context of each subject area. The purpose of this article is to offer a new way to see inquiry: as something that happens routinely in solving problems with information, as something that requires a common process but contextualized approach in each situation, and as something that is critical in personalized and lifelong learning.

The Call for Inquiry

Learning itself may be described as an information process enabling us to survive and thrive, driven by a natural curiosity about our world. The *National School Library Standards* recognize the critical nature of inquiry in the learning process, addressing it explicitly as one of the Shared Foundations that "describes the core values that learners, school librarians, and school libraries should reflect and promote" (AASL 2018, 17). But aspects of inquiry are also recognizable implicitly throughout all the Shared Foundations. School librarians recognize the value of inquiry in constructing knowledge,

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establishing lifelong learning habits, and encouraging personalized learning experiences. In addition, we know that inquiry activities inviting student voice, choice, and agency are highly motivating for student and educator alike.

The *National School Library Standards* also make clear that students engage in the inquiry process in a variety of situations beyond the annual research project: "Although individuals may not always consciously reflect on their inquiry processes, the process of asking questions, gathering information, making sense of the information, making decisions, and sharing results is something we all do every day" (AASL 2018, 28). Some call this "information problem-solving" to reflect the ubiquitous nature of inquiry (Eisenberg, Murray, and Bartow 2016). The *National School Library Standards* describe the competencies associated with inquiry, and provide guidance in instructional planning, assessment, and reporting of student growth. It's time for school librarians to take the lead and work with staff colleagues in changing the way educators see and teach inquiry.

Every Day Inquiry: Beyond the Research Project

Even when a formal inquiry process has been adopted within a district or school library program, it is often kept on the shelf, waiting to be pulled out for the annual research project. This practice reinforces the notion in students' minds that inquiry is something that happens only in school on research projects, and makes it difficult to answer the question often posed by students, "Why do we have to learn this? I already know how to do a Google

search!" Information problem-solving is more than just a Google search—it's a process that involves identifying the need for information, determining the best resources, locating and accessing information, synthesizing and sharing information, and evaluating the process. It also happens throughout every day, inside and outside of school, and in a variety of educational and personal situations.

It is important for students at every level to learn about all forms of inquiry—from informal information problem-solving to formal, structured research. Proficiency in the inquiry process is essential for students as they become independent, lifelong learners. The research on learning points to problem-solving as the critical difference between those who master content and those who do not; that is, experts in any content area are better at solving problems than novices (Bransford, Brown, and Cocking 2000). The AASL Standards describe a Key Commitment for the Shared Foundation of Inquire: "Build new knowledge by inquiring, thinking critically, identifying problems, and developing strategies for solving problems" (2018, 47). Let's face it. While our students may struggle with applying a formal inquiry process, they know problems when they face them.

School is not the only place where students learn. They learn in informal situations as well—at home, online, in public libraries and museums, playing sports or video games, and so on. This informal learning is influenced by student-driven motivation for learning and their control over the structure of the learning experience. Encouraging students to recognize their own information problem-solving situations as opportunities

to apply school-learned inquiry skills outside of school is critical in promoting independent and lifelong learning. One way to do this is to involve students in generating a list of information problem-solving situations they experience outside of school. Another approach is to collaborate with the public library to reinforce inquiry competencies and the inquiry process into homework help, makerspaces, gaming, and

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other services for children and teens. Partnerships with public libraries is an effective strategy for reinforcing inquiry learning in the public library as an informal learning environment. The *National School Library Standards* challenge us to guide students in seeing the process in their everyday lives at school and beyond, and to apply their understanding of how it helps them answer questions, complete assignments, and solve problems.

The AASL Standards call on us to "select and trust in a systematic inquiry process that supports true inquiry" (2018, 74). The Big6

information problem-solving process (Eisenberg and Berkowitz 1990) is simple but powerful, flexible, nonlinear, easily applied to everyday situations as well as research, and can be used with students in grades K through 12. The Big6 may be introduced to students by demonstrating a variety of applications: solving math problems, finding books to read, and completing research projects. Students may also be prompted to recognize situations for using the Big6 to solve problems outside of school: figuring out which movie to watch on a Friday night, finding a book to read in the public library, improved success in video games, and packing for a school-sponsored camping trip. It's time for school librarians to take the lead in showing students how to tackle any problem they face with skill and confidence—through the inquiry process.

Embracing a formal inquiry process such as the Big6 is not only useful in the context of inquiry learning, but also for planning instruction. An understanding of all the stages of the process, and guiding strategies appropriate to each, is essential to effective instructional planning. Guiding students through the inquiry process does not necessarily begin by locating sources of information (as students most often want to do) or even task definition (as preferred by teachers and school librarians). One of the advantages of the Big6 approach is that while all six stages are necessary for successful information problem-solving, the stages do not need to be learned or completed in a linear fashion. School librarians can work with students in recognizing the requirements of each assignment and matching those with the appropriate stage of the process to determine the skills students will need to develop and

apply. It's time for school librarians to take the lead in communicating to students and instructional partners the many applications and nuances of the inquiry process.

Every Way Inquiry: Information Problem Solving across Content Areas

It's also time to recognize that students will experience the inquiry process differently in each content area. In their *Knowledge Quest* article, Lauri J. Vaughan, Sue Smith, and Meredith Cranston (2016) introduced the concept of "disciplinary information literacy." They recognized that the problems students faced in each of the content areas required different approaches. Researchers have also found that experts in a particular content area are better problem-solvers than novices, but that this problem-solving expertise does not necessarily transfer to other content areas (Bransford, Brown, and Cocking 2000). This conclusion supports what we already know, that the type of problem students encounter in mathematics, for example, is different than the type of problem they encounter in other areas of the curriculum. School librarians need to collaborate with teacher colleagues in every subject area to understand the type of problems students face in each, and what success looks like.

When students recognize the context and type of problem that they face, they are better able to determine the type of information they will need and the appropriate approach to take; this is the Task Definition stage of the Big6. Understanding this will help school librarians become more effective in guiding students through the inquiry process as a teacher in the library and instructional partner in the classroom. Spending time on

recognizing the type of problems students face in each subject area goes a long way toward getting them off on the right foot in any problem situation. Just as students learn to distinguish between the four properties of addition (commutative, associative, identity, and distributive), so too must they learn to determine the appropriate style for a writing assignment (expository, descriptive, narrative, and persuasive). In social studies, they must identify patterns in the causes of conflict and social movements, just as they must identify and evaluate the impact of characterization, point of view, theme, tone, and other elements within literature. With this approach, students aren't simply solving problems in science and history, they are thinking like scientists and historians. This is the rationale for the Problem-Solving Learning Environment in which the curriculum is centered around content-specific problems (Jonassen 2011).

Recognizing every way inquiry improves the effectiveness of guidance through every stage of the inquiry process. When students recognize that inquiry in science looks different from inquiry in music, they also recognize the information sources that are reliable and relevant within specific content areas. In the Big6, this stage is called Information Seeking Strategies. Students learn to identify the useful resources in each content area (CultureGrams for geography and culture-related inquiry assignments, for example), as well as general ones (Britannica Online and ProQuest, for example). Moreover, students learn strategies for evaluating online resources within each content area.

The way information is located and accessed may vary as well. A History Study Center database search may be

the appropriate inquiry strategy for an exploration of the causes of World War I, but entering numbers into a calculator may be the appropriate inquiry strategy for determining values in a complex algebra problem (Location and Access stage of the Big6). Further, taking two-column notes may be an appropriate strategy for gathering examples of personification in literature, but collecting growth rates in a spreadsheet may be a more appropriate strategy for determining the effect of pollution on plant growth in an investigation of rainwater runoff (Use of Information stage of the Big6). Finally, the ways that students demonstrate learning will also be content-area dependent—think of a demonstration in a science fair, or a theatrical performance in a drama class. This stage, called Synthesis in the Big6, is critical in having students demonstrate their learning in every subject area. But students also need to recognize the most effective presentation strategies within each and for the audience they are addressing. School librarians who recognize that inquiry looks different across the curriculum may provide leadership that transforms instruction and learning. Finally, students should be able to judge their own success—in the final result of the inquiry as well as their skills in the process. These two assessments comprise stage six of the Big6, Evaluation.

Inquiry and Personalized Learning

John H. Flavell (1979) described metacognition as cognitive monitoring and regulation; that is, thinking about one's own thinking, and making necessary adjustments. In their book *Metaliteracy* (2014), Thomas P. Mackey and Trudi E. Jacobson expand the concept of information literacy to include metacognition. This approach
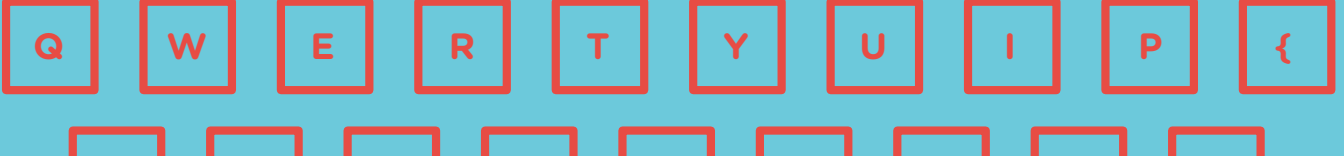
encourages critical thinking and an assessment of one's own knowledge, essential for personalized learning experiences in both formal and informal learning situations. When students draw upon their understanding of the inquiry process, they are better able to self-diagnose obstacles and faulty strategies. Students who understand the value of Task Definition, for example, will take the time necessary to think about the type of information problem they face, consider similar problems they may have resolved successfully in the past, and then begin locating information from the kind of sources they know will most likely lead them to success. As learning becomes more personalized, self-regulation becomes critical.

The AASL Standards are designed to guide the profession as it is practiced today. Informed by research and deep engagement with stakeholders, the standards highlight the value of inquiry throughout the learning process. What better time to see inquiry in a new way—as opportunities for learning through information problem-solving that happen every day and in every way? By helping students understand the metacognitive value of learning the inquiry process as they develop the competencies in the *AASL Standards Framework for Learners*, school librarians are providing students with powerful tools for transforming their own lives.

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Works Cited:

American Association of School Librarians. 2018. *National School Library Standards for Learners, School Librarians, and School Libraries.* Chicago: ALA.

Bransford, John D., Ann L. Brown, and Rodney R. Cocking. 2000. *How People Learn: Brain, Mind, Experience, and School.* Washington, DC: National Academy Press.

Eisenberg, Michael B., and Robert E. Berkowitz. 1990. *Information Problem-Solving: The Big6 Skills Approach to Library & Information Skills Instruction.* Norwood, NJ: Ablex.

Eisenberg, Michael B., Janet Murray, and Colet Bartow. 2016. *The Big6 Curriculum: Comprehensive Information and Communication Technology (ICT) Literacy for All Students.* Santa Barbara, CA: Libraries Unlimited.

Flavell, John H. 1979. "Metacognition and Cognitive Monitoring: A New Area of Cognitive-Developmental Inquiry." *American Psychologist* 34 (10): 906–11.

Jonassen, David. 2011. *Learning to Solve Problems: A Handbook for Designing Problem-Solving Learning Environments.* New York: Routledge.

Mackey, Thomas P., and Trudi E. Jacobson. 2014. *Metaliteracy: Reinventing Information Literacy to Empower Learners.* Chicago: ALA.

Vaughan, Lauri, Sue Smith, and Meredith Cranston. 2016. "An Argument for Disciplinary Information Literacy." *Knowledge Quest* 44 (5): 38–41.