Real-World Literacies

Disciplinary Teaching in the High School Classroom

Heather Lattimer

Principles in Practice

Literacies of the Disciplines

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Chapter One

Literacy in the Imagination Age: Learning-by-Doing

In his highly regarded TED Talks, education professor emeritus and thought leader Sir Ken Robinson offers a scathing critique of our current education systems, noting that too often we kill creativity and limit human capacity by failing to recognize and nurture a diversity of human talent. He argues that we need to fundamentally transform the structure of education in order to cultivate the talents of individual children as well as to be responsive to the rapidly changing demands of the twenty-first-century world.

> We have to change metaphors. We have to go from what is essentially an industrial model of education, a manufacturing model, which is based on linearity and conformity and batching people. We have to move to a model that is based more on principles of agriculture. We have to recognize that human flourishing is not a mechanical process; it is an organic process. You cannot predict the outcome of human development; all you can do is, like a farmer, create the conditions under which they will begin to flourish. (Robinson, 2010)

Comparative education scholar Yong Zhao (2009) arrives at a similar conclusion through his investigations of the American and the Chinese education models.

He finds irony in the fact that over the past decade, the United States has been working to standardize its education model, prioritizing rote skills and basic knowledge through standards, standardized testing, and adequate yearly progress (AYP) scores. This reform movement has been born largely out of fear that our position in the global economy is slipping, and slipping in particular to China. Meanwhile, in China, government leaders are looking to find ways to *de-standardize* the curriculum and cultivate more creativity through their education system. Chinese leaders recognize that to make the transition from being the "world's factory" to becoming a technology, innovation, and economy leader, schools need to do a better job of cultivating creative and diverse talents.

Observing the rapidly changing global economy and the emergence of new opportunities for communication, collaboration, and innovation provided through the creation of a virtual world, Zhao argues that we need to change our educational structures and goals:

> In the new era, we need more diverse talents rather than standardized laborers, more creative individuals rather than homogenized test takers, and more entrepreneurs rather than obedient employees. . . . To meet the challenges of the new era, American education needs to be more American, instead of more like education in other countries. The traditional strengths of American education—respect for individual talents and differences, a broad curriculum oriented to educating the whole child, and a decentralized system that embraces diversity—should be further expanded, not abandoned. (2009, pp. 181–82)

Robinson and Zhao join a chorus of voices arguing that in the beginning of the twenty-first century we are in the midst of a new transition from the information age to the "imagination age" (Pautler, 1998; Pucel, 1998). This era, they suggest, demands creativity, innovation, and imagination over analysis and evaluation. Because technology has democratized access to information, it is imagination—the ability to reconceptualize ideas, present information in new and creative ways, and develop innovative and original ways of thinking—that will add value to our economy and culture. Unfortunately, creativity and innovation, the very elements needed in the imagination age, are often devalued and diminished by our education systems. Quite frankly, despite the billions of dollars devoted to education by local municipalities, states, the federal government, and teachers like us who dedicate thousands of hours to help reform our system, the education we provide our students in too many cases does not meet the demands of the world they will encounter after they leave the K–12 system.

Why is this so? In part, it's because while the expectations for literacy have become increasingly complex, schools are too often stuck in a standardized, test-driven, knowledge-focused approach that fills our students' heads with information

but often fails to ensure that they can critically respond to, critique, evaluate, and investigate that information or independently access new information that might complement or contradict the official knowledge presented in their textbooks.

Unpacking *Literacies* of *Disciplines*

NCTE's policy research brief *Literacies* of *Disciplines* (2011), reprinted on pages xi–xv, provides a pathway toward building teaching and learning practices that respond to the economic, professional, civic, community, and academic literacy demands of the twenty-first century. The policy brief defines *literacy* broadly, referring, in fact, to *literacies* as a set of multifaceted social practices. Here, literacies are not defined as a particular text-based medium or a specific outcome but instead are seen as being adaptable to contexts, participants, and technologies. In other words, the term *literacies* encompasses communicating with friends and colleagues via text and email; searching and critically responding to information found online; creating multimodal presentations that include charts, graphs, images, audio, and video; and participating in virtual and augmented reality simulations—as well as reading a novel or writing a paper. This definition of *literacies* recognizes that our notion of reading and writing is continually evolving in response to new contexts, new purposes, and new media. Developing competence in this new world of literacies requires more than phonemic awareness, the ability to decode and comprehend; it requires being able to recognize, adapt, and respond to new purposes, audiences, and forms—a definition that fits well with the demands of the twenty-first-century workplace, community, and civic life (Russell, 2001; Rex, Green, Dixon, & Santa Barbara Classroom Discourse Group, 1998; New London Group, 2000).

The policy brief similarly moves beyond our traditional school-bound definition of disciplines. It emphasizes that *disciplines* are distinct from the *subjects* found in secondary schools. Whereas subjects are typically seen as silos or containers that hold and separate knowledge, NCTE's definition of *disciplines* emphasizes the creation of knowledge and takes care to note that disciplinary boundaries are becoming increasingly porous (Carter, 2007; Heller, 2010; O'Brien, Stewart, & Moje, 1995). The distinction between subject and discipline is evident if you think about the varying roles of history as conceived in a high school classroom versus history as practiced by historians. Whereas high school history is often taught as "fixed and stable, dropped out of the sky readymade" (VanSledright, 2004, p. 232), those who work in the discipline of history are expected to revisit historical documents and interpretations with new questions to generate new learnings that have relevance to our understanding of both past and present. If we teach history from a disciplinary perspective, students are not expected to memorize information so much as they are expected to learn to question, read critically, suspend judgment, consider and

effectively communicate new interpretations, and "cultivate puzzlement" (Wineburg, 2001)—a set of expectations that mirrors professional, academic, and civic demands of literacy in the twenty-first century.

What does this rethinking of the concepts of literacy and discipline mean for us as teachers? In many ways, it moves us beyond the popular notion of content area literacy as simply including some additional reading and writing assignments in science, math, and history classes. The policy brief challenges us to create spaces in which "students must encounter, be supported in, and be expected to demonstrate a plurality of literacies" (2; all page numbers cited are from the Web version). In other words, we must learn to recognize the unique languages and literacy structures that are represented by various disciplines and then help students both navigate within individual disciplines and travel among them (Bergmann & Zepernick, 2007; Childers, 2007; Graff, 2010; Thaiss & Zawacki, 2006; Young, 2006).

In his book *Time for Meaning*, literacy expert and former high school English teacher Randy Bomer describes his goals for teaching poetry: "I don't teach poetry so that kids will remember all about writing poems and be able to do it forever. I want them to develop habits of mind related to learning a genre, so that they can learn in whatever genres they need" (1995, p. 119). To meet the demands of *Literacies* of *Disciplines*, we must take a similar approach to disciplinary literacy. We must provide students with rich, inquiry-oriented learning experiences and teach them to learn how to learn. We must explicitly nurture habits of mind that will allow students to adapt literacy practices in response to evolving contexts, technologies, and disciplines. The literacy demands that students in our classrooms today will encounter in the workplace, academic sphere, and civic life in five, ten, or twenty years are nearly impossible to foresee. Framing teaching practices within robust definitions of both *literacies* and *disciplines*, and engaging students in learning experiences that authentically respond to these definitions, will allow them to succeed within disciplines today and prepare them to be successful as they traverse and transfer learning across disciplines and into new fields in the future.

Literacy Skills, the Imagination Age, and the Preparedness of Today's Graduates

So what will it take to prepare graduates of our K–12 schools to effectively navigate and lead in the imagination age? Our students will need literacy skills that empower them

- to read, understand, and critique new information and evolving ideas,
- to synthesize content across disciplines,
- to identify problems that need solving, and

- to develop new ideas and approaches and then explain, apply, and defend innovative thinking.

Proficiency in these areas requires mastery of basic literacy in reading, writing, listening, and speaking, but also the ability to go beyond the basics. No longer will it be enough to simply decode the words of a text and comprehend the meaning; graduates in the imagination age need to be able to

- analyze the material,
- critique its meaning,
- compare and connect across information sources, and
- apply the information or ideas presented to new situations and developing understandings.

And in their productive capacities, graduates must do more than restate and summarize. They need to use oral and written language

- to represent information in new and creative ways,
- to evaluate and respond to the ideas of others, and
- to effectively articulate and advocate for innovative ideas of their own.

So how are we doing? What do studies of recent high school graduates tell us about their readiness to effectively respond to the literacy demands of the imagination age?

Unfortunately, the news is fairly bleak. A number of measures indicate that as a nation we are proficient in neither basic literacy skills nor applied literacy practices. A 2006 workforce readiness survey of more than 400 employers from across the United States suggested that the majority of employers found high school graduates to be deficient in reading comprehension, writing in English, written communication, and critical thinking and problem solving (Casner-Lotto & Benner, 2006). A 2004 report on literacy in the workforce found that the nation's private employers spend an estimated $3.1 billion each year teaching their employees the literacy skills needed to be successful in their current positions (National Commission on Writing, 2004). Results from standardized tests reveal a similar pattern: the 2011 results for the National Assessment of Educational Progress (NAEP) writing test, often called the Nation's Report Card, found that only 24 percent of eighth- and twelfth-grade students tested as proficient in writing, while only 3 percent tested as advanced at each grade level.

If we segregate out results for those who plan to attend college, the news is not much better. The 2012 results of the SAT test showed reading scores at the lowest level since 1972 and writing scores down an average of nine points since 2006, when the writing section was introduced. Among 2012 high school graduates

taking the ACT test, approximately two out of three met college readiness benchmarks in reading, while just over half met benchmarks in writing. College instructors estimate that 50 percent of high school graduates are prepared for college-level writing (Peter D. Hart Research Associates, Inc. & Public Opinion Strategies, 2005). As of 2004, almost 42 percent of all first-year students enrolled in public two-year colleges were enrolled in at least one remedial course (US Department of Education, National Center for Education Statistics, 2004).

Even for those of us who aren't swayed by data gathered through surveys and standardized tests, the portraits being drawn of classrooms around the country tell us we need to do more to prepare students for this new world. Although wonderful examples of innovative schools and classrooms doing incredible things certainly exist, many of us have witnessed, experienced, or been pressured to implement instruction that prioritizes skill drills and coverage over meaning making and innovation. We know that too many weeks of the school year are dedicated to test preparation and that too few opportunities are provided for in-depth learning, authentic questions, and creative problem solving.

Clearly, we need to do more. To prepare our graduates for the imagination age, schools must increase the quantity and transform the quality of literacy instruction. Reading, writing, listening, and speaking need to be taught across disciplines in ways that go beyond basic literacy skills to promote critical analysis, creative response, and innovative representation. Doing so will require that we reframe the conversation away from generalized strategy instruction and toward disciplinary literacy. Rather than focus on isolated reading, writing, and oral language skills, we must instead begin to consider how to engage students in using language to build understanding, effectively communicate in discipline-specific contexts, explore new ideas, and innovate in face-to-face and digital learning communities. And literacy instruction must be seamlessly integrated into content instruction so that it builds understanding in the disciplines and cultivates the four *C*s of twenty-first-century skills: critical thinking, communication, collaboration, and creativity (Partnership for 21st Century Skills, 2011).

Moving toward an integrated literacy-as-grounded-learning requires a dramatic rethinking of our approach to instruction. It requires us to become designers of the learning experiences in our classrooms, recognizing external requirements, accessing community resources, and responding to the individual interests, strengths, and needs of our students. Rather than ceding control to textbook publishers, test developers, or perceived administrative demands, we need to take control of multiple competing demands on classroom time and content instruction to create learning opportunities that cultivate content understanding, literacy skills, and critical thinking, creativity, and innovation.

Initially, this approach may seem overwhelming, particularly if we view it through the prism of isolated skill and content instruction that, sadly, has become the norm in our era of standardized testing. However, as the following examples demonstrate, if we step back to consider how to build on what we already know about best practice instruction, we can find opportunities to create meaningful learning experiences that concurrently nurture content understanding, literacy skill development, and twenty-first-century skills.

Literacies of the Disciplines in Action

The following two examples come from secondary schools I've had the opportunity to work with in Southern California. Both courses focus on science learning and both make efforts to integrate literacy into the science content. Both, in other words, focus on helping students attain certain kinds of disciplinary literacies. You'll see immediately, however, that their approaches are very different and consequently so are the results. As you read, ask yourself how the instruction and the learning in these classrooms differ, how the students are positioned as learners, and how the teachers position themselves.

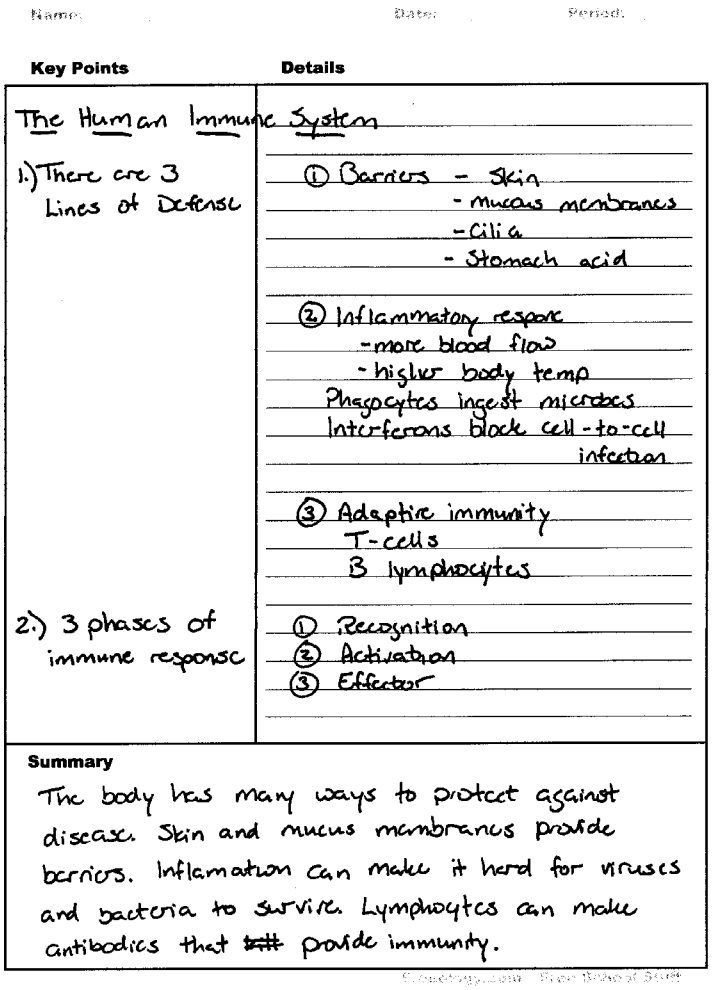
Unit on the Immune System

Colleen Wilson teaches tenth-grade biology at Ocean View High,[1] a large comprehensive school located in a working-class community on the edge of a large city. In mid-March, Colleen's biology classes begin a unit on the immune system. It is one of Colleen's favorite units because the course material provides so many practical connections. She launches the unit with several teacher-selected human interest stories intended to pique students' interest and YouTube videos that include graphic images of disease symptoms.

Students then read the relevant chapters from their textbooks, using a Cornell note-taking structure to assist in reading comprehension. Because the unit takes place in the second semester, students are already familiar with the structure of Cornell notes (see Figure 1.1) and how to use headings and other text features to develop reading comprehension questions and identify relevant information in the text. Most are able to complete the reading on their own and do well on the reading quiz used to assess their content knowledge.

Conscious of the need for greater student engagement to ensure content retention as well as the potential for making connections to students' lives outside of class, Colleen supplements the textbook with a simulation activity and several news articles about recent outbreaks of diseases. The simulation consists of students demonstrating the exponential rate of the spread of disease by distributing brightly

Figure 1.1. Sample Cornell notes.



Name: Date: Period:

Key Points	Details
The Human Immune System	
1.) There are 3 Lines of Defense	① Barriers - Skin - mucous membranes - Cilia - Stomach acid ② Inflammatory respone - more blood flow - higher body temp Phagocytes ingest microbes Interferons block cell-to-cell infection ③ Adaptive immunity T-cells B lymphocytes
2.) 3 phases of immune response	① Recognition ② Activation ③ Effector

Summary

The body has many ways to protect against disease. Skin and mucus membranes provide barriers. Inflamation can make it hard for viruses and bacteria to survive. Lymphocytes can make antibodies that ~~###~~ provide immunity.

colored stickers among their classmates. Students read the news articles about outbreaks of the flu, Ebola, and tuberculosis independently and then discuss them with their peers. Students also respond to each of these articles through a written response in the journals they keep for science class.

The culminating activity of the unit is an independent research project. This project provides an opportunity for students to strengthen their understanding of the science content and also supports the tenth-grade faculty goal of engaging students in at least three research projects in different disciplines during the course of the school year. Students are randomly assigned a focus disease and provided

with a series of guiding questions. Colleen leads students through the research process—teaching them how to use note cards to record information, providing an organizational guide for the structure of the paper, demonstrating appropriate citation of sources, and modeling the proper use of scientific language. At the end of the unit, each student turns in a five-page, double-spaced paper that is scored against a research rubric. If the paper scores well, it may be included in the student's academic portfolio.

Reading through students' reports, Colleen is generally pleased with the students' work. Most of them completed and submitted their work on time or close to it, they demonstrated core knowledge of the topic, and many have shown growth in their research and writing skills. But sitting down to grade the reports on a Saturday night after everyone else in her family has gone to bed, Colleen finds herself contemplating why she seems to work so much harder than her students do and wondering if the students care as much about their learning as she does.

Community Health Project

Just a few miles away from Colleen's classroom, Janie Campbell, a tenth-grade biology teacher at Innovations Academy, is preparing to launch a community health project. After the class settles in, Janie introduces Mercedes Rodriguez, the lead nurse practitioner at the local health clinic. Dressed in a white lab coat and still wearing a stethoscope around her neck, Nurse Rodriguez begins by sharing statistics on the incidence of disease in the local community. She notes that this neighborhood, which includes working-class residents, a large immigrant community, and off-base military housing, has significantly greater health concerns than those of surrounding neighborhoods. "We offer many services at the clinic," she explains, "but typically, by the time we see patients they are already sick. What we need is more education to inform the community about disease risks and prevention strategies. You are members of this community and we need your leadership to create a media campaign."

Nurse Rodriguez and Janie then tag-team to provide an overview of the assignment: Students will create a series of educational videos about diseases that pose the greatest risk to the community. Videos that meet standards in accuracy and quality will be posted to YouTube and the clinic's website, run on a continuous loop on screens in the clinic's lobby and the neighborhood library, and broadcast on local TV stations.

Although initially a bit intimidated by the scope and import of the task, Janie's students soon take ownership of the project. At Janie's suggestion, they have conversations with friends and family members, which reveal some of the human stories behind the statistics that Nurse Rodriguez presented. These stories help

students realize that disease prevention is a real and immediate need they can do something about.

With Janie's guidance, students develop a list of the things they will need to know to create informative and engaging videos and then set about their research. They begin by using their textbooks to develop general background knowledge about cell biology, disease, and immunity. They then split into teams to learn details about their focus diseases, including hepatitis C, influenza, pertussis, strep, and tuberculosis. For this research, students rely heavily on medical reference texts, skimming and scanning to find the relevant sections and then reading those materials closely to ensure accurate understanding. When more nuanced questions demand more detailed answers, students, with scaffolding support from Janie and the school librarian, dig into scientific journal articles and online databases available from a nearby university library. In addition, Janie invites local physicians, a biology professor, and a public health official into the classroom to provide up-to-date information on the latest disease treatment and prevention practices and to answer student-generated questions.

As students conclude their initial research phase, they start to craft storyboard outlines for their videos. They work in teams to synthesize information into a coherent educational message; create an engaging hook; develop a compelling narrative; create visuals that would inform and engross; and select facts, statistics, and anecdotes that effectively communicate their message. Along the way, they hold teacher conferences and peer critique sessions during which they are continuously challenged to transform the information they have learned from their research into a product specifically tailored for their community audience. As they work, students return again and again to their research materials—double (or triple) checking their facts, seeking out new details to help communicate a particular point, and working to make sure that what they are creating is accurate and relevant. "This is going to be seen by people from our community," one student comments. "It could be my cousins or my neighbors who watch it. It has to be good and it has to be right. If not, I will be letting them down by not providing them with the information they need to stay healthy."

As students plan, film, and edit their videos, they reach out to experts in the field and to other teachers who are part of the tenth-grade team. Nurse Rodriguez visits the classroom on several occasions, checking in on students' progress and offering suggestions informed by her firsthand knowledge of the target audience. Students send drafts of their videos to an epidemiologist at a nearby medical school who gives feedback on the accuracy of their facts and the integrity of the presentation. Students consult with their math teacher, Philip King, to get help with data graphing and statistical representation, prevail upon English teacher Connie Nash

to critique their video scripts, and get instruction in video editing, voice-over, and the art of digital animation from media instructor Will Evans.

In the days leading up to students' video presentations, students scramble to conduct final fact checks, finish editing their animations, and polish their presentation techniques. When the big day arrives, students come to school dressed in their best "professional" attire. Although Janie notices their nerves (and acknowledges she has quite a few butterflies herself), when the students step up to the podium to present their work to panels of health care professionals, media experts, educators, and community members, they appear poised and knowledgeable.

One at a time, teams share their videos, explain their objectives, describe their learning, answer panelists' questions, and reflect on the process. "I learned a lot about myself," one student tells the panel. "I learned how to set deadlines, do research, work with the other people in my group, and take responsibility to do my best." Another student reflects, "I didn't think I was going to like this project because it seemed like a lot of work and I didn't know anything about hepatitis when we first started. But I feel really proud now that we are done. I learned a lot about disease and feel much more knowledgeable about biology and medicine now. And the video we made is good. I showed it to my little brother last night and he thought so too. I like that we made something that can help other people."

After the final presentation, Janie congratulates her students and then collapses into a chair. The previous weeks have been exhausting but immensely satisfying. "I'm so proud of my kids," Janie exudes. "They worked incredibly hard on this project and really took ownership over their work." Her pride is well founded. Feedback from the panelists who attended the presentations is overwhelmingly positive. Comments include the following: "Fantastic work! You knew the content and were able to make it accessible and relevant for your audience. Well done!"; "I was so impressed by your knowledge and professionalism. I hope you consider careers in the health sciences"; and "I was stunned by the depth of your understanding. You were quoting from sources I didn't begin to read until my junior and senior year of college. Very impressive!"

Janie would be the first to acknowledge that there were bumps along the way as the community health project progressed: some students struggled to find accessible reading materials, several teams had difficulty coming to an agreement around their video storyboard, and a few students stumbled during their presentations. But overall the project did for students what Janie wanted it to do: it built deep content understanding. As the principal commented to me after the students' presentations, "These kids really know their stuff. And not just the stuff about diseases. They are beginning to talk like scientists, think like scientists, and think of themselves as scientists. This was a powerful learning experience."

A Tale of Two Units

These two units, the immune system unit at Ocean View High and the community health project at Innovations Academy, were taught to similar populations of students and had similar content learning objectives. Both addressed core competencies in the high school biology curriculum. Both included activities designed to engage students in the material. Both worked to integrate literacy standards into the curriculum. However, the learning experience for students in the two classrooms was very different. A central point of difference concerns the concept of real-world learning and authentic literacy. While Colleen's unit on the immune system at Ocean View High did a good job of creating a school-based learning experience, the community health project at Innovations Academy connected science content and literacy development to expectations and understandings demanded in the world outside of school.

So what were the underlying differences in these classrooms? As I observed the two units, I was struck by five key points of comparison that distinguished these approaches to disciplinary learning:

- **Authentic purpose and audience.** The community health project was grounded in a real need in the community. Students were invited to participate in doing real work for a real client for distribution to a real audience. Knowing that their work was going to be viewed by individuals from their local community increased students' motivation to ensure accuracy in the content and quality of their product. This approach reflects the reality of life after high school: you may not always get to choose your purpose or the audience for your work, but there is always a purpose and an audience that matters. Learning how to adapt to that purpose and respond to the interests and needs of the audience is essential for success.

  By contrast, the unit on the immune system included products, such as a research paper and Cornell notes, whose purpose was limited to the classroom and an audience limited to the teacher. Although the knowledge and skills gained from such activities have the potential for wider applicability, if students do not learn how to adapt to varying purposes and audiences through guided learning experiences while in school, we are limiting their understanding and ability to do so after they leave us. Engaging students in content and literacy learning with authentic purposes and audiences increases students' motivation, deepens their content knowledge, and prepares them with both the skills and the ability to adapt those skills to specific contexts in their future academic and professional interactions.

- **Flexible processes and negotiable structures.** Both units engaged students in structured learning experiences. Both required students to read texts and to write documents. However, the approaches to this

learning varied greatly. The unit on the immune system taught reading and writing through a linear approach. Students were instructed to use a research methodology that progressed step by step from information gathering to outlining to drafting to editing to completion. They were required to read the relevant textbook chapters from start to finish, taking notes on all of the information the publishers had identified as important through the use of headings, key terms, and other text features. Students were provided with a generic outline that structured their research paper for them, giving them both physical and metaphorical boxes in which to group their information and ideas. Each of these structures was intended to help scaffold the learning for students, providing them with supports to break down complex literacy activities and make them accessible for novice readers and writers in the discipline. The drawback, however, is that this linear approach bears little resemblance to the processes and structures students will encounter in the world outside of school.

In contrast, students participating in the community health project engaged in more iterative processes that more closely approximate literacy activities in the real world. Textbooks and other reference materials were not read from start to finish but instead approached as resources that could be skimmed and scanned to locate the content relevant to the questions that arose in the research process. The research process did not proceed in neat and isolated steps with clear boundaries between asking questions, information gathering, outlining, etc. Instead, Janie recognized that new information often leads to new questions and that organizing material into a work product for an audience often reveals holes in the data or the need for new resources. During the research process, students in the community health project were encouraged to move back and forth between research phases in response to the questions and needs that arose; most came to recognize that research is never "done" but is an ongoing quest for new learning so that we can better understand concepts and more powerfully represent information and ideas. Similarly, the writing that occurred in storyboarding and scriptwriting for the videos, while grounded in familiar narrative and persuasive text structures, needed to cross genre boundaries and adapt to the content and purpose of the project. The literacy activities in Janie's classroom had their foundations in established reading, writing, and research processes and structures but then encouraged students to go beyond them. Students were encouraged and provided with support to adapt their literacy work to the needs of the project. This is an approach that is much more reflective of and better preparation for the ways in which they will use literacy in the real world.

• **Teacher as facilitator.** When schools connect students with purposes and audiences outside of school, the dynamic of the teacher–student relationship changes. In the traditional classroom, such as that demonstrated by the immune system unit, the teacher's role is to es-

tablish priorities, determine content, deliver instruction, and evaluate student learning. The power and the opportunity to do the "thinking work" in the classroom rest almost entirely with the teacher. Colleen identified the texts that would be read, the questions that would be asked, the topics that would be researched, and the research paper structures that would be used. To an extent, this is entirely appropriate; teachers are expected to be more knowledgeable about both content and content literacy than their students in order to take a lead role in establishing expectations. But when the balance of decision making rests so heavily with the teacher, it removes opportunities for students to think critically about content. Further, it represents a level of micromanagement that, in the working world, would likely be frustrating for both employer and employee.

A teacher–student relationship that is much more responsive to the dynamic working relationship seen in most industries today is present in the community health project classroom. Here, Janie worked with students to set expectations and establish guidelines that were responsive to the project's purpose and audience. She provided content background to shape context for their project and guided them toward topic-appropriate resources. She taught literacy strategies and research processes but then allowed students flexibility to adapt the materials and strategies to fit the content and objectives of their individual work products. She checked in regularly, working with students individually and in small groups to assess content understanding, provide feedback, make suggestions, and redirect where necessary. This guided approach gave students the freedom to try things out, develop new approaches, and be creative. It demanded that students think critically about the content, asking questions, evaluating sources, and identifying strengths and weaknesses in their own work. And, because the work was iterative, with multiple assessment points along the way, the guided approach provided opportunities for students to make mistakes, assess their failings, reflect on their learning, and, with the support of their teacher and their peers, revise their work and strengthen their understanding. This type of facilitated learning encourages students to become independent, proactive, and responsive in their approach to problem solving, qualities that surveys of employers consistently stress as priorities for the workforce of the twenty-first century.

• **Access to experts.** Both Colleen and Janie care deeply about their disciplines and want to ensure that students recognize the relevance and importance of the topics being studied. However, their approaches to meeting this objective varied significantly. Janie brought content experts into the classroom. She introduced her students to health care professionals and biomedical scientists who provided students with targeted mentoring for the community health project. She asked experts in the discipline to give students feedback during the process and then to sit on the panels that assess the final videos and presentations. She required

students to find, read, and evaluate texts that are authentic to the discipline. And she encouraged her students to reach out to other teachers on campus, who brought their specialized knowledge of statistical representation and animation to support students' work.

In contrast, Colleen took on herself the responsibility for providing expertise. She selected the texts that students read, answered their questions, and read and graded all of their papers. Some might argue that this is what a teacher should do. After all, we are hired in part based on our content knowledge. But when we take all of that responsibility on ourselves, we limit our students' opportunity to develop deep understanding of the discipline. The reason for this is two-fold: (1) No matter how dedicated a learner you are, it is unlikely that you or any teacher will be able to stay fully abreast of scholars' evolving understanding across all the topics of your discipline. Connecting to the latest literature and to professionals who are dedicated experts on a particular topic gives students access to a much greater depth of understanding. (2) Outside of high school, learning opportunities won't be predesigned for students. They will need to understand how to connect to resources, both in person and in text, that can contribute to their learning. They will need to know how to seek out experts, ask thoughtful questions, sort through conflicting responses, and connect the information to knowledge they already have. Helping students to develop these practices while still in school prepares them with the knowledge, skills, and dispositions necessary to connect with experts in the real world.

• **Student ownership.** In both of the units profiled here, students did a significant amount of work either on their own or with their peers. However, only in the community health project did students truly own the work they completed. The authenticity of the project and the dynamic of teacher-as-facilitator allowed students to take ownership of both the product and the process through which they worked—to become agents in their own learning. They made choices about what was created and how it was made. As in the real world, the choices were circumscribed by the needs of the client, the availability of resources, and the expectations of their leader, in this case teacher Janie Campbell. However, the available options gave students the latitude to create a product that they determined was most appropriate to their purpose and best suited to their audience. They owned the results and, for better or for worse, had to take responsibility for the work they created.

Student ownership was less evident in the immune system unit. Colleen made many of the choices for students. Reading and research topics were assigned; the report structure was predetermined. Furthermore, the lack of an authentic audience meant that students had less of an incentive to create something that was truly unique and meaningful since it would be read by only one person before being assigned a grade and filed away.

As I observed in both classes, the enthusiasm gap was palpable. Students at Ocean View were completing the activities in the immune system unit, but most were doing the work because they felt obligated to, not because they truly wanted to. On the other hand, nearly all of the Innovations Academy students expressed significant enthusiasm for and pride in their work. Students who had previously been labeled as underperforming stepped up and worked hard on the project. At the culminating panel presentations, students were able to describe in detail the choices they had made, the thinking behind their choices, and their assessment of the quality of their work. They reflected on their own learning and identified areas of strength and areas for growth.

This sense of responsibility, reflectiveness, and pride of ownership is necessary for life outside of high school, where grades are not assigned, standardized tests don't determine job or career prospects, and success is determined by a willingness to work hard, take ownership, and engage as a learner, always seeking to improve. By providing students with opportunities to own their work while in school, we empower them with agency. Although they are novices, high school students can make real contributions to disciplinary conversations. Engaging our students in work that requires them to take responsibility for their learning not only provides them with the dispositions and knowledge to contribute in the future, but it also positions them to have a voice in shaping the field right now, valuing both their future potentials and their present strengths.

What Can We Learn from These Two Units?

Even if you're convinced that these five curricular concepts—authentic purpose and audience, flexible processes and negotiable structures, teacher as facilitator, access to experts, and student ownership—hold promise for student success, you still may find the reach of the work in the Innovations Academy classroom a bit daunting. The level of cooperation among teachers, the flexibility in curricular approaches, and the responses of the students may seem like a dream come true! My observations in these and other settings, though, have shown me that such work is indeed possible. While it's true that Janie Campbell received a great deal of support from administration and colleagues, at the heart of this classroom is a commitment to a different kind of education, one that is situated in a conception of *learning-by-doing*. With this goal at the center of disciplinary and literacy instruction, all kinds of educational possibilities open up. In subsequent chapters, you'll get the chance to see history teachers, literature teachers, science teachers, and math teachers open up their classrooms to real-world literacy grounded in this conception, all with different approaches situated in their own contexts.

Grounding Real-World Literacy in Theory and Research

The community health project at Innovations Academy integrates twenty-first-century skills and up-to-date media tools to shape disciplinary literacy into learning experiences with real-world relevance. However, the foundations of this unit and other similarly oriented classroom experiences are certainly not new to the twenty-first century. John Dewey, father of the progressive movement in American education in the late nineteenth and early twentieth centuries, advocated for a school curriculum that engages students in "learning by doing" (Dewey, 1916). More recent instructional reform movements that incorporate a learning-by-doing approach include inquiry education, project-based learning, and linked learning.

- ***Inquiry Education.*** An inquiry approach to education begins with open-ended questions. Students learn by responding to these questions through reading, research, discussion, and problem solving, facilitated and supported by their teachers. Inquiry education builds on the work of cognition research by Bruner (1966), Piaget (1971), and Vygotsky (1962), who argued against the transmission approach to education that was the norm at the time, typified by lecture and rote memorization. They posited instead that learning occurs through active student engagement with new ideas and information in a manner that allows the construction of individual and community understanding. More recent contributors to inquiry learning include Banchi and Bell's (2008) work on levels of

Classroom Application

Consider how these five concepts apply in your own classroom. What are you already doing? How could you strengthen these practices in the future?

- **Authentic purpose and audience—**Are students responding to real needs and questions? Will students share their work with an audience of peers, mentors, or community members?
- **Flexible processes and negotiated structures—**Do students have opportunities to revisit information and ideas as they learn more? Are students encouraged to ask and explore questions?
- **Teacher as facilitator—**Are students given responsibility for problem solving with guidance and support from the teacher? Are mistakes seen as opportunities for learning?
- **Access to experts—**Do students have opportunities to interact with experts in the field under investigation? Are experts providing mentorship to students as they build their own disciplinary understanding?
- **Student ownership—**Are there opportunities for student choice? Do students take pride in their work? Do students have agency to determine their success?

inquiry-based instruction in science; Beach and Myers's (2001) discussion of inquiry-based literature learning in English; and Carpenter, Fennema, Franke, Levi, and Empson's work on cognitively guided instruction in mathematics (1999).

• ***Project-Based Learning.*** In project-based learning (PBL), students are challenged to design a project such as a physical model, visual presentation, or digital representation that demonstrates their understanding of the subject under investigation and presents an original response to an authentic audience. Unlike what we might think of as more traditional school projects, such as the diorama book project or sugar cube pyramid, that typically come at the end of a unit and are intended to demonstrate what has been learned, PBL takes the stance that the project drives the learning, encouraging students to investigate and uncover core concepts in order to respond to the challenges posed by the project demands (Lattimer & Riordan, 2011; Markham, Larmer, & Ravitz, 2003). Research into the results of PBL suggests that it has a positive impact on students' motivation and engagement (Yetkiner, Anderoglu, & Capraro, 2008) and that it can be more effective than traditional instruction in supporting concept mastery, long-term knowledge retention, and critical thinking and analysis skills (see, e.g., Boaler, 1997; Strobel & van Barneveld, 2009; Walker & Leary, 2009).

• ***Linked Learning.*** Started in response to concerns about tracking, linked learning is a whole-school model that insists that all students, regardless of background or previous achievement, need to be prepared for success in college, career, and community life. Schools organized in a linked learning approach engage students in learning experiences that are both equitable and individualized through themed academies, internships, community service learning, and project-based learning that promote academic, professional, and civic achievement. Although a relatively young movement, linked learning has already produced significant evidence demonstrating that such an approach can have a positive impact on closing the achievement gap and raising overall performance (Center for Advanced Research and Technology, 2011; Hoachlander, Stearns, & Studier, 2008).

About This Book

The inspiration for this book comes from my own classroom teaching experience as well as my work with teachers in schools. I started my teaching career twenty years ago as a high school social studies teacher at Lincoln High School in San Jose. Assigned to the most challenging group of ninth-grade students, I tried everything I could think of to get students to engage, but not much seemed to work. Then one day I challenged students to research, write, and present the his-

tory of their communities. Despite some initial complaints and lots of foot dragging, nearly everyone did the work, they learned more twentieth-century history than I could have imagined, and they dressed in their Sunday best to present their findings to parents, school officials, and community leaders. The students were so proud of themselves, and I was immediately hooked on the idea of making learning authentic.

Today, as a university-based teacher educator, I continue to advocate for a learning-by-doing approach, and whenever possible I immerse myself in classrooms that are grounded in a similar philosophy. The examples in the pages that follow are drawn from these classrooms. In the San Diego area, where I now work, we are fortunate to have some incredible schools and teachers who have adopted school-wide learning-by-doing models using project-based learning or linked learning approaches. And we have amazing educators who "teach in the cracks" (Short, Schroeder, Kauffman, & Kaser, 2005), carving out space within more traditionally structured institutions to create innovative learning environments that are responsive to student needs.

Each time I visit these schools and classrooms, I come away inspired. I'm excited to be able to share some of their work in this book.

A preview of what is to come: Chapters 2 through 4 explore reading, writing, listening, and speaking and how these elements of literacy play out across the disciplines in a variety of classrooms where teachers are working hard to create a learning-by-doing approach. Chapter 5 addresses how teachers committed to these processes think about reflection, peer critique, and the ever-present assessment. The postscript provides practical tips for moving toward implementation while navigating the very real obstacles that we encounter as teachers in real-world classrooms. Each of these chapters provides clear guidelines and offers descriptive classroom portraits of teachers and students at work. Additionally, each connects the discussion to current findings of student achievement and research around best practices in the literacies of the disciplines.

I hope that as you read you dive into the ideas explored in each chapter, consider how they might connect to your classroom and your students, try out implementation in the classroom, and then assess the impact on student learning. And as you go, I encourage you to discuss your findings with colleagues and reflect on the implications for your teaching practice. I can't stress enough that these classroom portraits are meant as examples of what has worked for particular teachers in particular settings. These teachers would be the first to tell you that the ideas are meant to be adaptable to your own setting. One of the core principles of real-world and discipline-based literacy is that teaching and learning must be authentic, responsive, and context driven. Taking an idea and adapting it to the interests of

your students, the demands of your school, and the needs of your community isn't "cheating"; it is responding to the world around you and modeling the critical approaches and real-world practices we want to encourage for our students.

A Final Note

Although much of the conversation about applied learning and real-world literacy connects this work with better preparation for student success in college, work, and professional life, it is important to note that many of the advocates for these approaches to teaching and learning ground their advocacy in the goal of creating a better society. Dewey, for example, wrote extensively about the link between education and democracy, claiming that for democracy to thrive, meaningful and authentic educational experiences must be the norm for all children:

> Democracy cannot flourish where the chief influences in selecting subject matter of instruction are utilitarian ends narrowly conceived for the masses. . . . The notion that the "essentials" of elementary education are the three R's mechanically treated, is based upon ignorance of the essentials needed for the democratic ideas. Unconsciously it assumes that these ideals are unrecognizable; it assumes that in the future, as in the past, getting a livelihood, "making a living," must dignify for most men and women doing things which are not significant, freely chosen, and ennobling to those who do them. (1916, p. 200)

Inquiry education advocates Neil Postman and Charles Weingartner argue in *Teaching as a Subversive Activity* (1971) that teaching students to engage in asking and responding to authentic questions both prepares them to succeed in the world as it exists and positions them with the skills and understanding needed to promote change toward a more democratic and egalitarian society. "Once you have learned how to ask questions—relevant and appropriate and substantial questions—you have learned how to learn and no one can keep you from learning whatever you want or need to know" (p. 23).

More recently, in the 1990s and 2000s, PBL and linked learning advocates including Deborah Meier, Ted Sizer, the George Lucas Educational Foundation, and the Coalition of Essential Schools have all advocated for educational approaches in classrooms, schools, and school systems that enhance equality and opportunity in education. The first common principle of the Coalition for Essential Schools is "learning to use one's mind well," with a vision that schools should equip "all students with the intellectual, emotional, and social habits and skills to become powerful and informed citizens who contribute actively toward a democratic and equitable society" (CES, n.d.). Ted Sizer, former dean of the Harvard Graduate School of Education and cofounder of the Coalition of Essential Schools, writes of the transformative power of school:

> School exists to change young people. The young people should be different—better—for their experience there. They should know some important things, they should know how to learn additional important things, and they should be in the habit of wanting to learn such important things. They should have a reasoned, but individual point of view. They should be judicious, aware of the complexity of the world. They should be thoughtful, respectful of thought and of ideas which are the furniture of thought. (Sizer & Sizer, 2000, p. 103)

Engaging students in real-world literacy is crucial if we are to nurture the development of the judicious, thoughtful, and respectful young people Sizer envisions. Grappling with authentic questions and meaningful literacy experiences while in school will prepare students for individual success in college and career while also preparing them to improve our collective success as a community, nation, and world. This approach to teaching is challenging in many ways. It confronts the current standardized testing paradigm and demands that teachers take ownership of designing the learning experiences in their classrooms. It requires us to be more knowledgeable about our students and more responsive to individual interests and community needs. It is tough work. And it is essential if we are to truly educate for the twenty-first century.

Our highly technological and increasingly connected world needs more people capable of creative, innovative, and imaginative thinking that crosses disciplines. Why, then, are so many educators pressured to fall back on a standardized, test-driven, single-subject approach to instruction? How can secondary school educators across the disciplines build teaching and learning practices that respond to the complex literacy demands of the twenty-first century?

Heather Lattimer draws on *Literacies* of *Disciplines: An NCTE Policy Research Brief* and stories from high school classrooms to illustrate how we can learn to recognize the unique languages and literacy structures represented by various disciplines and then help our students both navigate within individual disciplines and travel among them. Lattimer explores instructional practices grounded in real-world contexts that provide students with opportunities to approximate the kinds of reading, writing, listening, and speaking that occur in the world beyond school.

Through a range of rich classroom examples, explanations of theory and practice in teacher-friendly language, guiding questions to support discussion and classroom application, and annotated lists of resources, Lattimer reframes the conversation away from generalized strategy instruction and toward true disciplinary literacy. This book proves that "we can find opportunities to create meaningful learning experiences that concurrently nurture content understanding, literacy skill development, and twenty-first-century skills."

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