The University of Texas at El Paso  
Department of Teacher Education  
Spring Semester 2014

TED 4350 Educational Workshop  
Tuesday, 5:30-8:20 pm, East Point Elementary, Room 600  
Course Number 25685

Instructor: Michele A. Sanchez, M. Ed., MRT  
E-mail: msanchez25@utep.edu  
Cell phone: 915-203-4158

Course Description from the University Catalog
This course covers methods and materials for developing higher cognitive and affective reading behaviors among students from K-12. Teaching strategies that provide for the development of critical-creative readers in both reading and content area subjects will also be reviewed. This course is an independent study.

Course Objectives/Student Learning Outcomes
On completion of this course, students will be able to:

1. Connect course content to state and national literacy/language arts standards (reading, writing, listening, speaking, viewing).

2. Demonstrate knowledge of the importance of reading for understanding, the components of comprehension, and how to teach students strategies for improving their comprehension.

3. Demonstrate the attitudes and habits of a reflective practitioner and teacher of critical reading, writing, and literacy.

4. Articulate the features of critical literacy classrooms and elements of teaching reading critically, and demonstrate the ability to apply these concepts in a critical literacy project.

5. Demonstrate growth as critical readers, writers, and interpreters of academic texts in the area of literacy education.

6. Create a Clinical Case Study based on classroom observations and relevant research.

Required Texts

Optional:
Key Digital Resources

- TEES English Language Arts and Reading Competencies for your level of certification. Available online at http://www.texes.ets.org

- Texas Reading Agency English Language Arts and Reading TEKS for a grade level within your certification level. Available online at http://www.tea.state.tx.us


- Voices from the Middle. http://ritter.tea.state.tx.us/rules/tac/chapter110/ch110b.html


- Coalition for Reading and English Supervisory Teachers (CREST). www.cresteducators.com

Course Expectations

This course will use a variety of formats for learning, including weekly readings, class discussions, individual and group activities, and weekly writing assignments. All assignments will be assessed in relation to the depth and thoughtfulness of your work and the quality of your attendance, participation, preparation, and completion of all activities, and the quality and clarity of your writing.

Students are expected to:

- Arrive on time for all class sessions and stay through the end of all class sessions.
- Read, think, and write critically about assigned readings before class.
- Participate actively in class activities.
- Be engaged in presentations and discussions (e.g., no cell phones, surfing the internet, or texting, unless it is part of a class activity).
- Listen carefully to the ideas of others and respond respectfully—whether you agree or disagree with their opinions.
- Challenge your own thinking, beliefs, and practices about reading and literacy.
- Ask questions when you don’t understand.
- Communicate with the professor when you need help with assignments (during office hours or via Blackboard).
- Maintain a list of key concepts and vocabulary from course readings.
- Store all your written work in a portfolio or binder.

Turning in your assignments: All assignments will be due on the day assigned. All work will be printed out and submitted in paper form, unless the assignment specifies electronic.
submission. If you miss class, it is your responsibility to submit your work by turning it in earlier or by sending it with another student.

**Attendance Policy:** Your attendance and active participation are vital to this course. The Teacher Education Department considers missing two weeks of class to be excessive and the student may be dropped for lack of attendance. If you plan to miss a class, please contact me as soon as possible. Likewise, it is expected that you be on time and attend the entire class period each week. Arriving late to class and/or leaving class early will be considered in your attendance for the course.

**Incomplete**s are granted very rarely and only in extreme circumstances when, for reasons beyond the student’s control, she or he is unable to complete the course requirements.

**Students with Disabilities:** If you have or believe you have a disability, you may wish to self-identify. You can do so by providing documentation to the Office of Disabled Student Services located in Union E Room 203. Students who have been designated as disabled must reactivate their standing with the Office of Disabled Student Services on a yearly basis. Failure to report to this office will place a student on the inactive list and nullify benefits received. If you have a condition which may affect your ability to exit safely from the premises in an emergency or which may cause an emergency during class, you are encouraged to discuss this in confidence with the instructor and/or the director of Disabled Student Services. You may call 747-5148 for general information about the Americans with Disabilities Act (ADA).

**Academic Dishonesty:** Academic dishonesty – which includes cheating, plagiarism, and collusion – is a violation of the norms and ethics of the university community. Plagiarized work will be reported to the Dean of Students for investigation and a grade of incomplete will be assigned pending the outcome of the investigation. To help us avoid using the ideas of other scholars without giving proper credit, we will follow the guidelines provided in the Publications Manual of the American Psychological Association (APA). Please let me know, during or outside class, if you have questions about academic dishonesty and how to avoid it.
Major Course Assignments.

1. Critical Reading Assignments 4 x 25 points each 100 points total
Four critical reading assignments will be given related to course readings following the course schedule. These assignments will assess your comprehension of a particular reading and your ability to read and write critically about what you have read. Formats and tasks of individual assignments will be discussed in class.

2. Internship Observations 100 points
You are required to participate in 10 hours of classroom observation outside of the time set aside for this class. This is a requirement for the field-based teacher education programs, and should be done in order to inform you as to best practices of teachers in both inside and outside of your field. You will turn in your signed observation record to the instructor at the end of the semester.

3. Clinical Case Study 100 points
This Case Study will demonstrate the skills and understanding of literacy from an assessment perspective. For this assignment, teacher candidates will develop a comprehensive clinical assessment report and present a panel discussion. Your Case Study should include:
Clinical Case Study Format

• Background and Positive Attributes
  o A description of your student
  o Give the student’s name (not the real name), age, and information.
  o Describe and list the student’s strengths and weaknesses. Always remember to build on the strengths and then work on the weaknesses.

• Assessment Used
  o List in bullet format the assessments you used to assess the student.
  o A description of your assessment activities/student data

• Analysis of Assessments
  o You will need to look closely at the results of the assessments that you used in the above section. Please include the results in this section. Explain what the results are telling you about the student and how you know this. You will need to be very detailed. Did any assessment lead you to another assessment? How did you choose one assessment over another? What problems or difficulties did you find the student possessed?

• Diagnostic Intervention
  o In this section, you will need to include a summary of what actions you took to help the student (comments and strategies that you used). Did they help? Why or why not? Progress of student will be reported here. Why did you take the action you took? Cite the textbook here. Remember to use APA guidelines. Did the student’s attitude change?

• Recommendations and Comments
  o How can the student continue to improve, once the tutoring has ended?
  o How can you get the parents involved?
  o What advice can you give the parent to keep their child advancing?
  o What strategies and activities can the student keep practicing at home, school, and alone?

4. Reflective Logs 100 points
The reflective logs consist of reflecting on the internship observations conducted. You are required to respond to a reflective question after each observation completed. There are a total of 10 reflective logs.

Possible Reflective Questions:
• What did I learn as a result of today’s teaching?
• What is the most important thing I learned today? Why was it important?
• How can I improve tomorrow’s lesson based on what worked and didn’t work today?
• How did my student receive my lesson?
• What is something in the lesson that you will remember? Why?
• What is something you learned in this lesson that you are proud of? Why?
• What was the most challenging part of this lesson? Why?
• What is your favorite part of this lesson? Why?
• If you could change one thing in this lesson, what would it be? Why?
• What are three things you consider the most important in this lesson? Why?
• What part of this lesson did not work out for the student?? Why?
• What is something you could have done to make this lesson better?
• What part of the lesson was the hardest for you?
• What part of the lesson was the easiest for you?
• What part of the lesson was most fun?
• What part of the lesson were you excited about?

The final exam will have 10 questions. Each question is worth ten points for a total of 100 points for the exam

Course Grading & Requirements:

Grades will be derived by adding the points earned out of the total possible listed below:

Grading

1. Critical Reading Assignments-25 points each x 4=100 points
2. Clinical Case Study=100 points

Total- 200 points

A= 200-179 (100%-89.5%)
B= 178-159 (89%-79.5%)
C= 158-149 (79%-74.5%)
D= 148-139 (74%-69.5%)
F= 138 (69% and below)

NOTE: Assignments and order of assignments are subject to change
Assignment Rubrics
### Critical Reading Assignments Scoring Rubric

<table>
<thead>
<tr>
<th>Completeness of Written Summary</th>
<th>Your Score</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Summary</strong></td>
<td>5</td>
</tr>
<tr>
<td>X 2</td>
<td>Entire summary is written in proper paragraph format. All sentences are complete, correct spelling is used, punctuation &amp; grammar are properly used.</td>
</tr>
</tbody>
</table>

| Key Ideas from Article         | 5          | 4          | 3          | 2          | 1          |
| Paper addresses all the key ideas presented in the article. Clear examples and facts from the article are presented to support key ideas. | Paper addresses most of the key ideas presented in the article. Clear examples and facts from the article are mostly used to support key ideas from article. | It is evident that the paper addresses key ideas from the article. There are examples and facts from the article to support these key ideas. | Paper addressed some of the key ideas presented in the article. There are some examples and facts from the article to support key ideas. | Paper does not address all the key ideas presented in the article. There are no clear examples and facts from the articles to support key ideas. |

| Analysis & Opinion             | 5          | 4          | 3          | 2          | 1          |
| Viewpoint supported by details from text | Paper addresses all of the key ideas he/she agrees or disagrees with. All details and examples are used to support his/her viewpoint. | Paper addresses most key ideas he/she agrees or disagrees with. Most of the examples presented support his/her viewpoint. | It is evident that the paper addresses key ideas he/she agreed or disagreed with. Details and examples to support his/her viewpoint is presented. | Paper addresses some key ideas he/she agrees or disagrees with. Some details and examples are used to support his/her viewpoint. | Paper does not address key ideas he/she agrees or disagrees with. Details and examples to support his/her viewpoint are not presented. |

| Reader’s Opinion on topic      | 5          | 4          | 3          | 2          | 1          |
| All of the personal opinions shared in this paper are about the topic. All of the details presented support his/her viewpoint. | Most of the personal opinion is about the topic presented. Most of the detail to support his/her viewpoint is shared. | Personal opinion about the topic is evident. Details are used to support his/her viewpoint. | Some personal opinion used is about the topic. Some details are used to support his/her viewpoint. | Personal opinion is not about the topic presented. A thorough detail to support his/her viewpoint is not shared. |

TOTAL________/25
### Clinical Case Study Scoring Rubric:

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Points</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title Page</td>
<td>5 points</td>
<td></td>
</tr>
<tr>
<td>Abstract</td>
<td>10 points</td>
<td></td>
</tr>
<tr>
<td>Background and Positive Attributes</td>
<td>20 points</td>
<td></td>
</tr>
<tr>
<td>Assessment Used</td>
<td>5 points</td>
<td></td>
</tr>
<tr>
<td>Analysis of Assessment</td>
<td>25 points</td>
<td></td>
</tr>
<tr>
<td>Diagnostic Interventions</td>
<td>25 points</td>
<td></td>
</tr>
<tr>
<td>Recommendations</td>
<td>5 points</td>
<td></td>
</tr>
<tr>
<td>References</td>
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</table>

**Total Points:** /100
Course Calendar
# TENTATIVE COURSE CALENDAR

<table>
<thead>
<tr>
<th>Dates</th>
<th>Topic of Discussion and Homework</th>
<th>Assignments Due</th>
</tr>
</thead>
</table>
| **January 21** | Introduction to Course  
  • Review course syllabus  
  • Text books  
  • What is Critical Literacy?  
  • Review list of novels for Independent  
    Reading Assignment | **January 28** Introduction to Course  
  • Read and Discuss CCRS Article  
  • Defining Critical Literacy |
| **February 4** | Understanding Academic Literacy                                                                 | **February 11** Understanding Academic Literacy  
  **Homework:** Strategies that Work  
  **Read** Chapter 1&2 | **February 18** Understanding Academic Literacy  
  **Homework:** Strategies that Work  
  **Read** Chapter 3 | **Critical Reading Assignment #1-CCRS Article** |
| **February 25** | Understanding Academic Literacy                                                                 | **March 4** Understanding Academic Literacy  
  **Homework:** Strategies that Work  
  **Read** Chapter 5 | **March 11** Week of Spring Break  
  No Class Scheduled |
| **March 18**   | Understanding Academic Literacy                                                                 | **March 25** Understanding Academic Literacy  
  **Homework:** Strategies that Work  
  **Read** Chapter 7 | **Critical Reading Assignment #2** |
| **March 18**   | Understanding Academic Literacy                                                                 | **March 25** Understanding Academic Literacy  
  **Homework:** Creating Literacy Instruction for  
  All Students |
<table>
<thead>
<tr>
<th>Date</th>
<th>Reading Assignment</th>
<th>Title</th>
<th>Homework</th>
<th>Notes</th>
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<tbody>
<tr>
<td>April 1</td>
<td>Read Chapter 7</td>
<td>Understanding Academic Literacy</td>
<td></td>
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<tr>
<td>April 8</td>
<td>Read Chapter 8</td>
<td>Understanding Academic Literacy</td>
<td>Homework: Strategies that Work</td>
<td>Critical Reading Assignment #3</td>
</tr>
<tr>
<td>April 15</td>
<td>Read Chapter 9</td>
<td>Understanding Academic Literacy</td>
<td>Homework: Strategies that Work</td>
<td></td>
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<tr>
<td>April 22</td>
<td>Read Chapter 10</td>
<td>Understanding Academic Literacy</td>
<td>Homework: Strategies that Work</td>
<td></td>
</tr>
<tr>
<td>April 29</td>
<td>Read Chapter 11 &amp; 12</td>
<td>Understanding Academic Literacy</td>
<td>Homework: Strategies that Work</td>
<td>Critical Reading Assignment #4</td>
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<tr>
<td>May 6</td>
<td>Read Chapter 13</td>
<td>Understanding Academic Literacy</td>
<td>Homework: Strategies that Work</td>
<td>Clinical Case Study</td>
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<tr>
<td>May 13</td>
<td></td>
<td>Final Exam</td>
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Additional Resources

- Articles for Critical Reading Assignments
Articles for Critical Reading Assignments
Articles for Critical Reading Assignments-Article #1

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College, Careers, Citizenship Pages 28-34

College and Career Readiness: Same or Different?
David T. Conley and Charis McGaughy

Whether they're headed for college or a career, students need a solid foundation of academic knowledge combined with crucial thinking and learning skills.

The importance of all students being college and career ready is one of the most discussed issues in policy circles and secondary schools these days. But are college readiness and career readiness one and the same? The answer has far-reaching implications for how U.S. secondary schools are organized and how they educate students.

But First, A Look Back

Through most of the 20th century, college readiness and career readiness were more or less distinct, in part because what we now call career readiness was called job training and took the form of vocational education. In fact, from the 1920s on, large school districts had separate high schools for vocationally oriented students and those going on to college (Tyack, 1974). Even in the high schools themselves, vocational students were mostly separated from college-bound students. This model, with its assumptions about the separation of career and college preparation, remained strongly rooted in high schools throughout the 20th century.

The economy, however, was not so static. Entirely new categories of occupations rapidly emerged with the shift from agricultural and industrial jobs to service jobs. Knowledge workers and the creative class became increasingly prevalent (Florida, 2002). The skills to be successful in this new economy were fundamentally different from those that the old economy required (Carnevale, 1991, 1992). Increasingly important were foundational academic knowledge and skills; communication capabilities; technology proficiency; problem-solving strategies; and flexibility, initiative, and adaptability. This dramatically shifting set of expectations signaled the obsolescence of the distinction between college and vocation as the fundamental organizer for secondary education.

During the 1990s, states adopted education standards that defined what students needed to know and be able to do, but these standards were silent on what constituted college readiness and career readiness or the relationship between the two. Standards for Success, the first set of standards specific to college readiness, was created in 2003 under the sponsorship of the Association of American Universities (Conley, 2003). More than 400 faculty members at leading U.S. universities identified what it takes for students to be ready to succeed in entry-level courses at their institutions.

Shortly thereafter, the American Diploma Project defined college and career readiness with input from postsecondary faculty, economists, and members of the business community. Achieve, the sponsor of these standards, characterized the standards as representing an "unprecedented convergence" of educator and employer opinions on what it means to be ready for college and careers (Achieve, Education Trust, & Thomas B. Fordham Foundation, 2004). Although Standards for Success and the American Diploma Project standards had considerable overlap, they were not identical (Rolfhus, Decker, Brite, & Gregory, 2010).
A few years later, ACT (2006) published an influential study that claimed that college and career readiness were the same. To research this question, ACT researchers studied job requirements, which they then cross-referenced against an ACT job skills assessment system. They then mapped the findings onto ACT’s college-readiness standards (ACT, 2011) and concluded that the readiness requirements for both college and career were substantively comparable.

This finding was welcomed in many quarters because it seemed to solve the problem of how to educate students with a wide range of interests and goals. But the question still persists: Are career readiness and college readiness truly one and the same?

**Tackling the Issue**

Over the past six years, we at the Educational Policy Improvement Center in Eugene, Oregon, have conducted a series of studies that provide insight into this issue. Our approach has been to determine the requirements that students face on entry into a wide range of initial postsecondary courses. The instructors of these courses review college- and career-readiness standards and identify the standards necessary for success in their courses. We collect and analyze material from their courses, including syllabi, assignments, readings, and tests, to confirm what they tell us.

**Academic Content and Cross-Disciplinary Skills**

We conducted multiple analyses of general education courses required for a bachelor's degree and of courses associated with career certificates and associate's degrees (Conley, 2005, 2010; Conley, McGaughy, Cadigan, Forbes, & Young, 2009). One such study (Conley, McGaughy, Cadigan, et al., 2009) analyzed nine common entry-level career and technical education subject areas at Texas colleges. Participating instructors completed a course profile, uploaded a course syllabus, and determined the importance of a set of cross-disciplinary standards that included key cognitive strategies, learning skills, and foundational knowledge necessary across all subject areas. We analyzed courses statewide in accounting, drafting, introduction to computers, marketing, and business English. We found that cross-disciplinary standards, such as study skills, problem solving, critical thinking, and goal setting, are important for student success in these career-oriented courses.

A second study analyzed nursing and computer programming courses in Texas (Conley, McGaughy, Brown, van der Valk, & Young, 2009). The key finding was that the prerequisite academic content necessary for success varied much more than did the cross-disciplinary skills, which we found common to all courses. For example, the computer programming courses required significantly more mathematical skills than did the nursing courses. Conversely, nursing courses required significantly more scientific knowledge than did courses in computer programming.

**The Common Core Connection**

We recently completed a national study that included nearly 2,000 faculty members who taught entry-level courses in 25 subject areas at more than 500 two- and four-year postsecondary institutions (Conley, Drummond, DeGonzalez, Rooseboom, & Stout, 2011). We asked the faculty members how applicable and important the common core state standards were for success in their classrooms. The course areas included 14 necessary for a bachelor's degree and 11 associated with career pathways. Bachelor's-related classes were drawn from general education subjects in English, mathematics, science, and social sciences. Career pathways courses came from the fields of business, computer science, and health care.
We found a subset of the common core state standards to be important across all course areas. These included speaking and listening, reading informational texts, and writing in a variety of genres. The standards for mathematical practices, which include reasoning and problem solving, were the most highly rated across all subject areas in both academic and career-oriented courses. The specific applicable English and math content standards varied considerably by course area in both the academic and career-oriented courses. For example, reading literature was not emphasized outside English courses. Statistics were more important to science readiness, and computer technology courses required higher math skills across all math standards.

What We Found

The Skills Students Need

These results suggest that college readiness and career readiness share many important elements, but they're not exactly the same. The elements they share most consistently are the skills all students need to be ready for a variety of postsecondary learning environments. These include study skills, time-management skills, persistence, and ownership of learning. Postsecondary instructors at a wide range of two- and four-year institutions stress the importance of these skills across subject areas and programs. A lack of proficiency in these skills probably affects career-oriented students more adversely than it does students entering bachelor's degree programs—in part because career-oriented programs tend to offer fewer supports to help students develop these skills if they lack them on entry and in part because students in such programs are more likely to be discouraged by problems early in their program.

In addition, we found that students need to have a range of cognitive strategies at their disposal, such as the ability to formulate problems, collect information, interpret and analyze findings, communicate in a variety of modes, and do all of this with precision and accuracy. These strategies are particularly important when students are confronted with tasks that require them to apply content knowledge in novel and non-routine ways. The precise set of knowledge and skills students need is influenced significantly by the next step they intend to take, with various fields of study, institutions, and certificate or degree programs requiring proficiency in different content knowledge.

Career Awareness Opportunities

Although we don't expect students to craft a customized program of study while in high school, they do need to be exploring more college and career opportunities earlier on so they can understand what content knowledge, learning skills, and cognitive strategies are necessary to succeed in a particular career pathway or college major.

For example, students can explore career options beginning in middle school through assignments requiring research on the requirements and opportunities associated with various occupational and professional pathways. Students should be encouraged to state a career goal beginning in 9th grade (which they could easily and regularly change thereafter).

Courses with challenging academic content that also apply knowledge to real-world problems and projects help bridge the gap between college-bound and career-oriented students. Brief internships or career-exploration opportunities can help students develop more specific aspirations. Secondary school programs that help students take greater ownership of a learning plan linked to their post–high school goals will see more students prepared for college and careers. Students should not necessarily be trained for a specific job by the time they leave high school, but they should be focused on a career pathway or an area of study. This principle holds
true for all students, regardless of whether they plan to pursue a certification in a two-year program or a bachelor's degree.

Steps Schools Can Take

Secondary schools can accommodate both a core of common expectations and enough customization to prepare all students to pursue both college and careers. Here are some suggestions gleaned from schools that are having success in this area (Conley, 2010; Educational Policy Improvement Center, 2009).

Establish a college- and career-ready culture in the school and community.
The debate about whether high school is for job training or college prep is over. All adults in the school community, including parents, faculty, and business leaders, understand that the school's mission is focused on college and career readiness for all. Adults send the message to all students that education and preparation continue beyond high school by holding high expectations for all students, talking about "when you go to college," being knowledgeable about college-readiness standards and college entrance requirements and majors, and telling their own story of how they became college ready.
The adults in school pay particular attention to students who would be the first in their family to attend college, and they provide programs and supports that help these students develop and maintain high aspirations. These programs include additional information on college requirements and financial aid options, along with individual attention and encouragement.

Measure what's important for both college and career success.
The school moves beyond traditional standardized test results and includes additional indicators of college and career readiness that measure a range of skills. These include key cognitive strategies; key learning skills and techniques, such as goal setting and progress monitoring, test-taking and note-taking methods, and persistence with challenging tasks; and key transition knowledge and skills, such as "college knowledge" of admissions requirements and processes, financial aid, the culture of college, and self-advocacy.
More courses use embedded assessments tied to college and career readiness, such as extended essays, demonstrations and culminating projects, research papers, and inquiry-based experiments and investigations. These assessments yield information on student thinking and problem-solving skills. Grading is better calibrated to college readiness so that an A really means that a student is ready for post-secondary studies. Career-oriented courses include demanding projects and tasks that incorporate academic skills.

Align all courses to college- and career-readiness standards.
The school ensures that any course a student takes, whether it covers career and technical education or college-prep content, builds core academic skills necessary for postsecondary readiness. Key skills, such as time management, study skills, and goal setting, are explicitly taught and practiced. Middle and high school courses and expectations integrate closely so that students progress continually toward the outcome of college and career readiness, even as they take varying routes toward this goal.
Partner with local postsecondary institutions and businesses.

The school offers students more exposure to postsecondary opportunities. High school and college course expectations are aligned and continuous. Students have multiple opportunities for career exploration through class assignments and connections with local colleges. Transition programs help more students prepare gradually for postsecondary expectations by conceiving of college readiness as a continuum, not a cut score. Offerings ranging from senior seminars on college readiness, to placement tests administered in high school, to advanced placement classes, to college campus visits, to summer bridge programs help students get ready for postsecondary education.

Concurrent and dual-enrollment programs offer students additional opportunities for college-like experiences. Recent high school graduates who are enrolled in local colleges return to advise and mentor students. Strong partnerships with postsecondary education institutions result in extensive data sharing, which suggests changes in the high school curriculum. These include reevaluating the high school's reading and writing requirements, the informational reading skills and technological skills that students need, and the types of exams that students should expect.

Flexible, Yet Targeted

As convenient as it would be to declare that college readiness and career readiness are one and the same, evidence suggests it's more complicated than that. The good news is that secondary school programs of study can be designed in ways that don't require distinctly different courses or programs for students with different interests or aspirations. All students can be challenged with rigorous academic content and then build skills and nurture interests necessary to achieve more personalized goals.

Foundational content knowledge provides students with flexibility. More targeted knowledge and skills prepare them for postsecondary success in specific areas. By focusing on both, secondary schools can enable all students to prepare for successful futures.

The Career-College Blend: Two Schools Where It Works

Polytech High School, Woodside, Delaware

Students in this magnet career technical high school engage in a rigorous college-preparatory curriculum and learn under the motto, "Power of knowledge for work and/or college." The school serves more than 1,100 students, of whom 71 percent are white, 22 percent are black, and 22 percent are eligible for free or reduced-price lunch.

Polytech is composed of five academies: the Educational Foundations Academy for freshmen as well as four career-themed academies that focus on industry, technology, professional services, and health care. Incoming students explore 21 different technical concentrations and undergo a formal interview to gain acceptance to their chosen concentration. Over the next three years, students follow a prescribed course plan. By graduation, they gain skills in a high-demand career area and, in some cases, also earn a professional certification (for example, automotive service excellence [ASE] certification or certified nurse's assistant [CNA] certification).

The school also focuses heavily on college preparation. It's the only technical school in Delaware to offer advanced placement courses. The school's graduation requirements exceed Delaware's curriculum standards, with additional credits required in a technical concentration area.
Consequently, Polytech has the highest number of required credits in the state. All students participate in and benefit from Polytech’s advisement and support system (PASS). Students meet with their advisors at least four times each year to discuss their four-year high school plan and their two-year post–high school plan (known as the 4+2 plan). In 2008, the school’s graduation rate was 97 percent. Black students graduated at the highest rate of any high school in Delaware. In 2009, more than 70 percent of Polytech graduates went directly into postsecondary education. Most of these students were the first in their family to attend college. Many students use the marketable skills they acquire at Polytech to support themselves through college, and they use their academic preparation to succeed in college.

**Sammamish Senior High School, Bellevue, Washington**

Sammamish Senior High School’s mission is to prepare all students for postsecondary success, and the school expects all students to complete an advanced placement (AP) course before graduation. This comprehensive public high school serves 1,200 students. Thirty-four percent of students qualify for free or reduced-price lunch. Thirty-two percent of students speak a first language other than English, and students from ethnic minorities represent approximately 40 percent of the student body.

The district has what amounts to a default college-preparatory program for all students. The curriculum development team has worked in partnership with outside experts, district officials, and teachers to design a curriculum that is aligned with AP and International Baccalaureate requirements. Curriculum coaches work directly with teachers to implement and periodically evaluate the curriculum, and teachers take an active role in improving and adding to the curriculum through an online system known as the Curriculum Web.

In 2010, Sammamish High School received a U.S. Department of Education Investment in Innovation grant. One objective of this initiative is to raise the level of rigor in the curriculum by connecting students with local professionals in science, technology, engineering, and mathematics. The initiative uses problem-based performance assessments in both AP and non-AP courses to support and measure student growth; provides supports for struggling students, with a particular focus on increased mathematics literacy; and offers professional development for teachers implementing a rigorous problem-based curriculum.

The four guidance counselors and support staff at Sammamish Senior High School play a key role in helping students understand college readiness, develop an academic plan, prepare and register for the PSAT/SAT and AP exams, research career options, and apply to colleges or technical schools. The graduation rate at Sammamish is 91 percent, and approximately 85 percent of graduates matriculate to a two- or four-year college or university.

**References**


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Articles for Critical Reading Assignments-Article #2

WHAT IS CRITICAL LITERACY?
5/11/12 8:40 AM

Critical literacy views readers as active participants in the reading process and invites them to move beyond passively accepting the text’s message to question, examine, or dispute the power relations that exist between readers and authors. It focuses on issues of power and promotes reflection, transformation, and action (Freire, 1970).

THE PRINCIPLES OF CRITICAL LITERACY

The Principles of Critical Literacy (McLaughlin & DeVoogd, 2004) include a number of essential understandings and beliefs about the power relationship that exists between the reader and the author. The four principles follow:

1. Critical literacy focuses on issues of power and promotes reflection, transformation, and action. Whenever readers commit to understanding a text—whether narrative or expository—they submit to the right of the author to select the topic and determine the treatment of the ideas. For example, if we, as teachers, read a headline that says, “New Security Standards for Schools Cause Tax-Rate Increase,” we would recognize the power of the author of the article to name the problem and determine and express what he perceives to be the negative effects of increased security standards. In turn, we, as readers, may use our power to question that perspective and engage in reflection about whose voice might be missing, discounted, or silenced in the article. As a result, we might choose to represent the alternative view of the subordinated group—the schools—and change the title of the text to “Additional Security Measures Provide Greater Protection for Our Children.” The readers draw from their background knowledge to create this transformation, which might result in taking an action such as writing a letter to the editor of the local newspaper or speaking to a group about the importance of school security. In addition, the readers may also gain a new appreciation of the effect of perspective in writing or even a new understanding of the possible positive costs of increased security. This is an example of how critical literacy focuses on issues of power and helps subjugated or oppressed groups, in this case the teachers, to help “politicize themselves and engage in action aimed at challenging existing structures of inequality and oppression” (Cummins & Sayers, 1995, p. 23). “The challenge is to adopt practices that will not only open up new possibilities but also will begin to deal with taking action” (O’Brien, 2001, p. 53). Good intentions or awareness of an unjust situation will not transform it. We must act on our knowledge.

This cycle of “reflection and action upon the world in order to transform it” is what Freire (1970, p. 36) calls praxis. By nature, this process is not passive but active, challenging and disrupting the ideal (Green, 2001) or commonplace (Lewison, Flint, & Van Sluys, 2002) for the purpose of relieving inequity and injustice.
2. Critical literacy focuses on the problem and its complexity.

Educational situations that are fairly intricate are often viewed from an essentialist—very simplistic—perspective. In critical literacy, rather than accepting an essentialist view, we would engage in problematizing—seeking to understand the problem and its complexity. In other words, we would raise questions and seek alternative explanations as a way of more fully acknowledging and understanding the complexity of the situation. For example, it would be essentialist to merely suggest that unmotivated students should receive an extrinsic reward for reading or be punished for not reading. Problematizing—or examining the complexity of this situation—would reveal that the lack of motivation is likely due to a variety of factors that may include poor-quality texts, students’ past reading experiences, classroom climate, self-efficacy, purpose, or limited opportunities to self-select, read, and discuss books in social settings.

3. Critical literacy strategies are dynamic and adapt to the contexts in which they are used.

There is no list of methods in critical literacy that work the same way in all contexts all the time. No technique that promotes critical literacy can be exported to another setting without adapting it to that context. As Freire (1998, p. xi) has observed, “It is impossible to export pedagogical practices without reinventing them.”

Comber (2001b, p. 271) has observed that when teachers and students are engaged in critical literacy, they “ask complicated questions about language and power, about people and lifestyle, about morality and ethics, and about who is advantaged by the way things are and who is disadvantaged”. In order to participate in such a classroom environment readers must play not only the roles of code breakers, meaning makers, and text users, but also the role of text critics (Luke & Freebody, 1999). In other words, readers need to understand that they have the power to envision alternate ways of viewing the author’s topic, and they exert that power when they read from a critical stance.

In any exploration of critical literacy, the teacher should constantly assess student responses to ensure that the experience is true to the philosophy and goals of critical literacy, although perhaps not consistent with the examples of others who practice critical literacy. For example, teachers may begin using an approach to critical literacy that is presented here or that they have seen working in another classroom, but upon reflecting on instructional goals and on what is happening in their classes, they may adapt the method to make it more applicable—more meaningful—in that particular context. The dynamic nature of critical literacy supports this type of adaptation. There is a sense of empowerment and confidence in the act of creation that cannot be achieved by copying. Even when a method has already been used, it is never quite the same in future applications. This is why those who are critically aware are fond of quoting Antonio Machado, the Spanish poet, who said, “Caminante, no hay camino, Se hace el camino al andar”—“Traveler, there is no road. The road is made as you walk” (1982, p. 142).

4. Critical literacy disrupts the commonplace by examining it from multiple perspectives.

Examining the point of view from which a text is written and brainstorming other perspectives that may or may not be represented, challenges students to expand their thinking and discover diverse beliefs, positions, and understandings (McLaughlin, 2001). It helps students to transition from accepting the text at face value to questioning both the author’s intent and the information.
as it is presented in the text. For example, social studies teachers might consider looking at Columbus’s explorations from multiple perspectives. In reflecting on whose voices are missing, the class may decide that the perspectives of the Tainos, the people who inhabited the island where Columbus first landed, or Columbus’s crew on the final voyage are not represented. Appreciation for and exploration of these alternative perspectives facilitates viewing situations from a critical stance (Lewison et al., 2002; McLaughlin, 2001).

This excerpt comes from Critical Literacy: Enhancing Students' Comprehension of Text, by Maureen McLaughlin and Glen DeVoogd. In this clear, easy-to-use resource, the authors present a sound instructional framework that is based on the latest theory and research and brought to life through a variety of theme-based classroom lessons for the primary, intermediate, and middle school grades.

Posted in News By Scholastic Teaching Resources
Teaching Critical Reading with Questioning Strategies

Larry Lewin

Three engaging classroom practices turn middle schoolers into critical readers.

It is time—actually past time—to address critical-thinking and analytic-response skills in our classrooms. The pendulum is ready to swing from overreliance on rote learning and prepping for standardized tests to preparing students to be 21st century thinkers. And thank goodness; our world needs students who can read texts critically, not just fill in bubbles.

Among the many higher-level thinking skills our students need is the skill of generating thoughtful questions. The ability to routinely generate mental questions while reading, listening, or viewing something not only boosts attention and alertness, but also strengthens comprehension (Duke & Pearson, 2002). When you ask yourself questions about incoming information, you are paying attention, self-monitoring, and actively constructing knowledge. Yes, students already ask us questions. But it has been my experience as both a classroom teacher for 24 years and a staff developer in schools for more than a decade that the questions kids ask typically either seek clarification on procedural matters (Which numbers are we supposed to do?); attempt to cut a deal (Can we write two paragraphs instead of three?); or try to detour the group from the lesson (What time does this period end?).

What we want from students, of course, is the kind of questioning that spurs critical thinking and analytical response. Students need to ask questions if they are to read for real learning.

The following three question-asking activities move learners from "starter" questions to intermediate-level questions to advanced questions that touch the highest levels of Bloom's taxonomy. As a consultant, I've used all three activities in partnership with middle school teachers in a variety of settings and have shared them as literacy strategies with preservice and inservice teachers.

Sparking Starter Questions

An activity called Questions Mailed to My Teacher introduces students to the habit of asking questions as they read. I adapted this one from an activity called Chain Notes in which each student writes a quick response to a review question written on a large envelope.1 I've modified Chain Notes in two ways. First, I write my name and school address on the front of the envelope. Second, instead of composing a question for student response, I have students write their own questions about the reading (directed to me) and insert those questions into the envelope. The last student to insert a query "mails" the envelope by delivering it to my desk.

Questions to My Teacher serves three purposes: It gives kids practice asking questions and monitoring their own comprehension as they read, it introduces students to the crucial idea that questions have different levels of complexity, and it helps teachers diagnose students' comprehension. By reading the questions, teachers glimpse what students know as opposed to waiting until the chapter test to find out whether all is well—in other words, they practice formative assessment.

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For example, when teacher Tyler Nice reviewed questions from his 6th grade ancient history class about a chapter on Egyptian pyramids, he noticed that students' questions showed different levels of thinking. This gave him insight into how critically they were reading and putting information together. Consider these three student-generated questions:

- Why did grave robbers sometimes steal the mummy?
- Why are step pyramids called step pyramids?
- I wonder why the people blamed the pharaohs for angering the gods.

The first question shows that the learner needs to review information already presented; the textbook explained the value of stolen mummies. The student who wrote this question missed that piece of information—bad news about his comprehension abilities. The good news is the student sensed something was missing in his understanding.

The second question indicates a communication problem between the reader and writer. The text included an illustration of a step pyramid clearly showing steps on the structure. Literacy educator and author Taffy Raphael (Raphael, Highfield, & Au, 2006) would classify this as a "think and search" question because the information is provided in two (or more) different locations in the text. This learner did not put it all together, however, and the question reveals a comprehension gap—fortunately sooner rather than later.

The third question shows higher-order thinking; this student is wondering about information that the author didn't provide. Kudos to this student for asking a "wonderment" question. The learner is clearly on the ball and even points out a deficiency in the text.

Taking this questioning stance helps student readers realize that reading comprehension is always a two-way street. Instead of always blaming themselves for difficulties with understanding—and perhaps losing motivation—they come to see that the problem can often be traced back to the writer. And they may even be inspired to track down answers through further reading. For instance, here's a great, generative question a middle school science teacher received: I wonder why each nucleotide consists of three different types of materials. As you read the questions kids submit, sort them according to their complexity. One categorization I use is "thin versus thick" questions. Thin questions are literal, recall questions that are easy to answer because the information is in the text (like Why did grave robbers steal mummies?) Why would a teacher allow students to ask such obviously answerable questions? Because they build confidence by allowing students to begin at a "doable" level, which primes the pump for more challenging questions later. Thick questions, on the other hand, require student readers to go beyond the text and speculate, hypothesize, or make inferences. These questions often inspire more complex questions.

As you debrief this activity with your class, explain to them that not all questions are the same; questions come in different degrees of complexity and difficulty, and different kinds of questions are useful for different purposes. Give students guidance and practice in asking thicker questions. You might have students brainstorm a list of things they'd like to know after reading the text and direct them to start each query with a phrase that usually leads into broader questions, such as these created by Vincent Ciardiello (2007):

- What are some other ways …
- What if you …
- Can you imagine …
- If …, then …
• How might …

**Becoming Sidekicks**

Once students have practiced asking their teacher questions, bump them up to the intermediate level by asking the *author* of a text questions.

I call my favorite intermediate-level activity Thin, Thick, and Sidekick Questions. Tell students they will act as a sidekick to the author as they are reading, meaning they will be the author’s dependable ally and helper. It’s their job to be there for the author by pointing out any problems in the text that may disrupt other readers’ understanding. Another way to cast it is that they are to be a curious sidekick who asks the author questions about the decisions she or he made in the writing and, at times, ponders how well these decisions will work in reaching readers.

Terry Kennedy, 6th grade teacher at Twin Peaks School in Tucson, Arizona, assigned her class to read a short story narrated by a cat that goes to the vet and directed students to ask the story's author sidekick questions. Her students took right to the activity, asking questions that reflected curiosity as well as gentle, implied criticism:

- Would you consider explaining more what the narrator is thinking?
- I am wondering if the narrator gets in trouble a lot, and how often?
- Did you consider adding another character? Two fat house cats doing this would be funnier.

Often when students ask these kinds of questions, their understanding of the author's purpose becomes clearer. This opens students to a monumental change in perception: They realize that reading is a communication between two people, a writer and a reader, for the purpose of exchanging information about a topic.

If possible, I send students' questions to the author. With persistence, you can locate a surprising amount of author contact information using the Internet (see Lewin, 2006, for suggestions).

**From Curious to Suspicious Readers**

Advanced question asking relies on—and builds on—students' ability to ask starter and intermediate questions. To help students get to this level, I define for them three levels of questioning connected to Bloom's taxonomy (1956).

- Type I questions seek to understand information from the reading.
- Type II questions cause the reader to analyze, critically examine, and appraise the information presented by recognizing what is missing or only implied.
- Type III questions judge the author's position or formulate an alternative—or even contrary—hypothesis.

If we point out to students that Type I questions look like thin questions and Types IIs look like thick ones, the transition to Type IIIs will be easier. Students will also realize that the labels we choose to describe types of questions are less important than the ability to recognize and generate different types.

Type III questions take students to the level of critical or even, so to speak, skeptical reading by teaching them to ask tough questions about the author's position, decisions, biases, or agenda. I
appreciate skeptical readers in class because they are constantly evaluating instead of only trying to understand.

To prompt students toward this higher level, remind your students that they, as readers, and the author should be trying to work together to develop full comprehension of the author's ideas. Tell them to be on the lookout for any missing, misleading, or mistaken information—or even any possible hidden agenda. After you teach students to ask Type I and Type II questions, urge them to build on those questions, considering things they might want to know that can't be found in the text.

Encouraging students to direct questions to the writer helps them go beyond information seeking to analysis of ideas. Bart Pollard at Cottage Grove High School in Oregon nudged his learners to this level as they read Edgar Allan Poe's essay "The Philosophy of Composition." Notice that they address the author directly in the following questions:

- Do you believe that the death of a beautiful woman is the most tragic thing a poet can write about?
- You say you wrote "The Raven" in a step-by-step procedure. Do you think all poets work this way? Do they have to follow your approach?

These go beyond "sidekick" questions. Sidekick questions reflect curiosity and they are supportive in nature because they assist the author in troubleshooting potential difficulties for future readers. The questions here are more pointed and more challenging. I call this "talking back" to the author—politely of course.

It helps to offer—and model—sentence frames like these that lead to Type III questions:

- You say _____, but what about _____?
- You imply ______, but ______?
- Are you saying that _____? If so,______?
- Why don't you mention ______?
- Didn't you consider ______?
- If what you say is true, what about ______?
- What you say is interesting, but I think that ______.

By teaching students how to generate questions when learning new content information, we empower them to think. And if ever there were a century that demanded higher-level thinking to solve global problems, it's the 21st.

References


**Endnote**

1 This activity is available on the Web site of the National Teaching and Learning Forum (www.ntlf.com/html/lib/bib/assess.htm)

*Author’s note:* For more question-asking activities, see my book *Teaching Comprehension with Questioning Strategies that Motivate Middle School Readers* (Scholastic, 2009).

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Teaching Science Literacy

Maria Grant and Diane Lapp

Four actions help teachers foster citizens who are critical thinkers about science-related issues.

Jacqueline, a 12th grader, is purchasing her first car and feels torn as she balances conflicting desires and messages. She yearns to be seated behind the wheel of a stylish vehicle, a yearning fueled by advertisements portraying women in luxurious cars. She's also confronted by billboard messages that claim "best fuel economy for your money!" and "great for the environment!"

With her modest budget, Jacqueline knows she must consider the cost of routine maintenance and gas. She also cares about how the fuel emissions of different brands of cars will affect air quality and the environment. Jacqueline realizes she needs more information—including information on carbon emissions, the ozone layer, and global warming—to make a careful decision.

Every day, the need to make decisions related to science confronts young people. Although buying a car might seem to be a financial or lifestyle issue, the choice connects to environmental science. Fortunately, Jacqueline has practiced solving problems, analyzing data, and making informed, data-driven decisions in her science classes; and she understands that her decisions today can affect the environment she will live in tomorrow.

Scanning articles in Consumer Reports, Jacqueline notes columns of data comparing average miles per gallon on the freeway, safety testing data, and carbon fuel emissions ratings of the three car models she's considering. She reads about the strengths and weaknesses of each model, including pricing and resale value, and makes notes to guide her decision making.

We might say Jacqueline is critically literate in science, meaning she has the ability to read, write, think, and talk about real-world science issues (Lapp & Fisher, 2010).

Critical Literacy as Personal Empowerment

As part of working toward scientific literacy for students, teachers must consider the concept of critical literacy. Just look at the number of science-related issues that directly affect human beings—global warming, access to clean water, and the availability of renewable energy, to name just a few—and ask yourself two questions:

1. Do most students think about the effect of these issues on their everyday lives?
2. Do our students consider the roles they might play in changing how a science-connected problem is resolved over the coming decades?

Probably not, unless they are taught to do so.

As Trefil and O'Brien-Trefil (2009) noted, questions like these should provide the foundation of young people's scientific literacy and related social responsibility. A key part of being critically literate is becoming involved in issues beyond the personal.
Teachers can help students become part of society's science conversations by using real-world applications of science in instruction and by inviting students to discuss and debate relevant and motivating content. Informed acts that make a difference in society—whether as simple as casting a ballot for or against an environmental issue or as complex as working on the research and development of a new alternative fuel source—are characteristic of individuals who possess critical science literacy.

As a science educator and a literacy educator—who are also both high school teachers and university professors—we propose four actions to promote critical literacy in science classrooms.

1. **Identify science topics of interest.**

An astute science educator can weave real-world science topics into a standards-based curriculum without sacrificing a moment of purposeful instructional time. A look at global warming in the physics classroom can lead to a basic discussion of water density or to a sophisticated explanation of the Stefan-Boltzmann law (which can be used to determine how much energy the sun gives off and to calculate the temperature of Earth, both crucial elements in understanding global warming). Such conversations lend relevance to what might otherwise be an isolated discussion of theory. And students who think critically about germane issues are more likely to be interested, active participants in the classroom.

We believe every standards-based notion needs to be connected to the real world. Consider the following suggestions for topics:

- X-rays and the human body (connected to anatomy and nuclear medicine).
- The effects of drugs on the body and mind (related to anatomy, neuroscience, and health).
- Oil spills (connected to oceanography, geology, and marine biology).
- Drought and water use (connected to geology and earth science).
- The effect of natural disasters (connected to geology and earth science and health).

Classroom science teachers must build an extensive list of this type before they plan their lessons and then invite students to own the list by adding topics that they would enjoy studying. The goal is to make students want to live science.

2. **Engage students in reading the research.**

After selecting a topic, it's time to build students' base of knowledge. For background science information, science-related texts are the first resource to examine. Unfortunately, students often stumble in reading science textbooks or scholarly articles, which generally use unfamiliar, multisyllabic words and sentences that require extensive background knowledge.

Science educators must generate connections among science concepts, societal issues, and the vocabulary students will meet in textbooks. Consider a chapter on water in an earth science textbook that deals with concepts aligned with the science standards: "know the importance of water to society, the origins of fresh water, and the relationship between supply and need" (adapted from the California Department of Education Earth Science Standards). The book might use such terminology as *fluvial systems*, *flow management*, and *restoration*. These are important terms for any relevant conversation on water use, but likely unfamiliar ones. An understanding of where and how river waters originate and issues related to human use and reuse of water could help motivate students to learn such terms and build a foundation that would eventually allow for an expanded discussion of flow management and restoration.
How might a teacher approach the topic of water in a way that's relevant and interesting to average 9th or 10th graders and builds background knowledge? One strategy is to assemble an array of topic-related texts from various sources, including trade books, news articles, and even poems. Scientists in the field often read every article they can find on a topic to build background knowledge and gain an understanding of terminology currently used in a particular field of study; they call this practice "reading the research."

Secondary-level teachers can apply "reading the research" to any science topic at hand. For example, trade books like *A Drop Around the World* (Dawn Publications, 1998) or *One Well: The Story of Water on Earth* (Kids Can Press, 2007) provide access to water-related vocabulary and foundational ideas about water use, both of which are essential to higher-level reading on the topic. A collection of news articles related to pertinent water-use issues might ignite passion and spark related conversation among newly motivated students.

Lists of science-related trade books and reading resources are available from the National Science Teachers Association and the American Association for the Advancement of Science. Consider the so-called "toilet to tap" proposals that provoked debate in San Diego in the 1990s. The idea is that toilet water from one community can be cleaned and pumped back into reservoirs that provide water to the home taps of other communities. Although a heated argument led to the demise of the initial proposal, the practice of reusing toilet water has been tried in numerous communities. In Orange County, California, for instance, cleaned toilet water is reintroduced into aquifers before it's pumped back through taps. This is a real-world, relevant issue that some states may soon present for the approval of voters, a population that will shortly include our middle and high school students.

3. **Teach students to read like scientists.**

To foster comprehension, it's not enough for students to merely have a handful of topic-related readings to peruse. They must also develop the ability to read and think like scientists. This means developing strategies for reading scientific writing and building a deep understanding of related vocabulary.

One of the best ways for teachers to help students learn how to comprehend a science text is to model the thinking that occurs while reading graphs, charts, data tables, and data analysis sections. Proficient science readers will read the text that correlates to a table of data, for example, and then study the table, looking for features like units of measure, data range values, and column titles. They will then look back at the text to reread, or continue reading, in an effort to connect this information to the text.

A teacher can conduct a think-aloud while reading so students can learn what proficient science reading looks and sounds like. For instance, 9th grade science teacher Ms. Kim looks at a chart in a text and says, "I think this is showing the percentage of freshwater on earth. I know that I just read in the text that freshwater means there are little or no dissolved salts in the water." As Ms. Kim models how she goes back and forth between the text and the chart to determine meaning, she's also showing that she thinks about the text as she reads.

Likewise, a teacher can model how to recognize typical text patterns in science writing, show how to use root words to determine word meaning, or connect prior knowledge to new ideas. A teacher might say,

I remember last week when we read about how water is transferred through an aqueduct, or a long system of canals and tunnels, between Colorado and Southern California. Maybe the aqueduct near Washington, D.C., is similar.
4. **Guide learners to evaluate data.**

Students need to understand how to evaluate data sources. Numbers connected to chemicals found in seawater sampled near the explosion of the British Petroleum oil well in Louisiana would probably hold no meaning for the untrained student. However, students who understand something about the units these numbers represent (for instance, that μg/L means micrograms per liter) and that the values of benzene or naphthalene need to be evaluated in reference to what levels of such chemicals are harmful can make meaning from these data.

Students need to understand where data were collected, how they were collected, and what they represent. Like scientists in the lab or in the field, the classroom scientist must learn that it's crucial to consider multiple sources of data to analyze and draw conclusions. Although data collection may not always be possible in a classroom lab, a teacher can ensure that students have opportunities to review real-world data from multiple sources. Visit data centers at the National Oceanic and Atmospheric Administration or the U.S. Environmental Protection Agency for real data on everything from the level of oceanic sediments to the locations of toxic chemical storage sites in the United States.

Students could analyze numerous sources of data related to the recent oil spill in the Gulf of Mexico. For example, in small groups students might compare online sources showing U.S. government data on the amount of oil remaining from the spill and data on the same question published by private water-sampling firms. They could create a compare-and-contrast chart and write a summary of their conclusions and lingering questions.

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**Beyond Car Shopping**

Teaching focused on fostering critical literacy has far-reaching implications. As young people like Jacqueline experience such instruction, they become more perceptive about the world around them and more empowered to make decisions about how they interact with that world.

**References**


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