

**MOTIVATING CONTEXTS FOR LEARNING:
INCREASING ACADEMIC RIGOR AND
IMPROVING LITERACY DEVELOPMENT
IN MAINE'S CTE CENTERS**

Report on the 2006 Maine Department of Education
Career and Technical Education
Promising Practices Initiative

Prepared by:
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Promising Practices descriptions and mini-case studies developed by
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TABLE OF CONTENTS

Motivating Contexts for Learning: Promising Practices Being Used in Maine’s CET Centers to Increase Academic Rigor and Promote Literacy Development.....	1
Promising Practice: <i>Academic/Literacy Integration</i>	5
Bath Regional Vocational Center (BRVC).....	7
Caribou Regional Technology Center	10
Presque Isle Regional Career and Technical Center (PIRTC).....	13
Promising Practice: <i>Career Academies</i>.....	17
Lewiston Regional Technical Center (LRTC)	18
Promising Practice: <i>School-wide Literacy Teacher Professional Development</i>.....	23
Mid-Maine Technical Center (MMTC)	25
Options and Formats for CTE Literacy Professional Development.....	29
Promising Practice: <i>Literacy Integration Across the Curriculum</i>	32
United Technologies Center, Region 4 (UTC)	35
Mid-Coast School of Technology, Region 8 (MCST).....	38
Promising Practice: <i>Use of an Onsite Academic/Literacy Specialist</i>.....	44
Capital Area Technical Center.....	46
Northern Penobscot Technical Center, Region 3	48

MOTIVATING CONTEXTS FOR LEARNING: PROMISING PRACTICES BEING USED IN MAINE'S CTE CENTERS TO INCREASE ACADEMIC RIGOR AND PROMOTE LITERACY DEVELOPMENT

The purpose of this report is to outline promising approaches being implemented in Maine Career and Technology Education (CTE) centers. Each of the mini-case studies in this document showcases efforts that Maine CTE centers are making to *increase academic rigor* and *promote literacy development*. Although five separate approaches are highlighted, all integrate this dual focus.

Increasing Academic Rigor

All of the featured approaches in the *promising practices* initiative support increased academic rigor. Two curriculum integration approaches—*academic integration* and *career academies*—specifically focus on the integration of science and other academic content with material addressed in CTE program areas. This practice increases the reading, writing, and thinking skills needed to be successful, and several centers exploring these approaches are also focusing on literacy development.

Promoting Literacy Development

The other three approaches—*use of an onsite academic/literacy specialist*, *literacy professional development*, and *increasing academic rigor/literacy integration across the curriculum*—focus on integrating literacy (and sometimes math) skills into the CTE curriculum so students are able to meet the rigorous demands of the 21st century workplace. Academic rigor is also enhanced when students are taught and expected to do more reading, writing, presenting, and thinking within the context of their CTE program area.

Description of the CTE *Promising Practices* Initiative

As part of an effort to promote academic integration and literacy development in CTE centers, Maine Department of Education's Career and Technical Education Division contracted with the Center for Resource Management (CRM) in Portsmouth, NH. The goal of the contract was to explore, document, and provide technical assistance to promising initiatives in Maine's 27 CTE centers that focused on increasing academic rigor and developing students' literacy skills as part of the CTE program. Department of Education staff and members of the executive board of Maine's CTE professional association met with CRM literacy consultants to determine the desired outcomes and protocols for the initiative. Directors from all of the centers were invited to submit an application indicating how the program used one or more of the outlined approaches.

Nine Maine CTE centers¹ (one third) were selected to participate in the initiative and took part in extensive phone interviews, sharing program documentation, and hosting site visits. Selected programs were characterized under one of the identified *promising practices*: use of an academic/literacy specialist on staff (2), a career academy model (1), academic/literacy integration in a selected program area (3), a school-wide professional development model (1), and/or literacy integration across the curriculum (2). Some programs appeared to utilize multiple approaches; this was investigated during the onsite visit and conversations with directors and CTE teachers and a determination was made as to which promising practice was most fully exhibited at the site.

Selected programs represented a geographic range (southern, mid, coastal, and northern Maine) and configurations as centers [independent regional (2), physically connected to a

¹ Participating CTE Centers: United Technologies Center–Region 4, Bath Regional Vocational Center, Capital Area Technical Center, Caribou Regional Technology Center, Lewiston Regional Technical Center, Mid-Coast School of Technology–Region 8, Mid-Maine Technical Center, Northern Penobscot Technical Center–Region 3, Presque Isle Regional Career and Technical Center.

specific high school (6), incorporating multiple locations (1)]. Site visits by Julie Meltzer, Director of Literacy Research and Development at CRM, took place between April 27, 2006 and June 6, 2006. A CTE Department of Education staff member participated in three of the visits.

A fuller description of each *promising practice* was written. A mini-case study of each *promising practice* site was developed based on a review of documentation, conversations with staff (and, in some cases, students), and other data collected during site visits. These case studies were disseminated in print form and will be made available electronically by the Maine Department of Education for others to read.

A presentation of initial cross-site findings was presented at the CTE directors' retreat in early August. At the annual state CTE conference in October 2006, directors and CTE teachers from each of the *promising practices* sites presented their work during two scheduled concurrent sessions. This gave others, who were thinking about how to initiate or further one of the highlighted approaches, an opportunity to learn from those already implementing the practice at their site.

Cross-Site Findings

1. *Every site displayed evidence of changes in teacher practice.* In all nine sites, the participating teachers were able to present ways in which their teaching practice has changed as a result of the initiative at their site. CTE staff described the rationale for curricular, instructional, and/or assessment changes; plans for the following year; and why the initiative constituted a *promising practice*. At several sites, teachers (and sometimes students) shared their perceptions of how student reading, writing, thinking, presenting, and learning has shifted as a result of changes in instruction, expectations, and/or assessment. There were indications at all nine sites that teaching and learning is, in the participating programs, either more academically rigorous and/or engaging and/or more demanding in terms of the reading, writing, and presenting involved than what was occurring one year ago.² At the majority of sites, expectations of students were on the rise. In some cases, students' capacities to meet these expectations, when accompanied by appropriate instruction, were very impressive.
2. Initiatives were generally less than a year old and, therefore, showed little evidence of impact on student performance at the time of the report. In all of the programs, anecdotal and student work evidence of improved literacy habits and skills and student engagement with reading, writing, and presenting was demonstrated. However, the majority of proposed programs had just gotten underway during the 2005–06 school year. Only three (33%) of the programs in the initiative carried forward approaches from previous years: career academy (Lewiston); literacy integration across the curriculum (Region 8); and academic integration into a specific program (Caribou). Although these programs were beginning to look at how to gather evidence of impact, none had sustained data collection that could be examined to determine impact on student performance. Technical assistance during site visits included conversations about how this data might be collected and tracked.
3. *Commitment, vision, and support of the director is key.* In each case, the knowledge, vision, and support of the director was essential to starting the initiative and/or to supporting the work proposed and carried out by others. In all nine of the participating centers, the director played a key role of allocating resources; altering schedules to support the work; hiring personnel; developing critical relationships with the principals of sending schools or with the advisory board to obtain support; and connecting the initiative to the goals of the CTE center.

² Evidence based on teacher and student description and/or annotated review of student work.

4. *Knowledgeable and committed teachers are essential.* At all nine centers, there were particularly knowledgeable and committed teachers involved with the initiative. In some cases, these individuals were essential in bringing others on board. On the CTE side, participating teachers were extremely knowledgeable about their area *as well as* the academic and literacy demands of that area, be it auto mechanics, biotechnology, culinary arts, precision machinery, auto repair, engineering, graphic design, computer technology, health occupations, or building trades. On the academic side, English, math, and science teachers had to know the applications of their discipline to a variety of CTE programs in order to be effective.
5. *Professional development appears critical.* Four of the centers in the *Promising Practices* initiative sent mentors to be trained through the CTE Literacy Mentor training. Participating CTE centers sponsored onsite literacy institutes in the past year (2); sent teachers to literacy training occurring throughout the state (8); hosted literacy workshops at their location (3); or contracted with literacy consultants to work with them onsite (2). This need for professional development seemed especially important at sites attempting to integrate literacy development into CTE program areas.
6. In general, the approach to improving academic rigor or literacy development was, at the time of the report, limited to one to six programs at the center and staff participation was voluntary. There were three centers where this was not the case and the focus on literacy was more wide-spread (Region 8, UTC, and MMTC), and there were two additional centers where there was a strong intent to broaden the focus to become center-wide during the 2006–07 school year (Region 3 and CATC). In the remaining four programs, three of which focus on academic integration and one which is a career academy approach, the school-based initiative was more limited either in terms of the CTE program areas involved (health occupations, engineering, agricultural science) or the academic department working with CTE (science). Issues with credits, curriculum, appropriate student placement, scheduling, program access, and articulation remained in several sites.

Next Steps

There is a need to identify how the state department of education and the Maine CTE professional association can work together to: 1) support these sites to continue to strengthen the initiatives that are underway, and 2) provide technical assistance to other CTE centers that wish to implement one or more of these promising practices.

Acknowledgements

Thanks go to all of the CTE directors, staff, and students who participated in the nomination process, provided documentation, hosted site visits, and participated in multiple conversations with Julie Meltzer over the past year. It is evident that CTE directors and teachers in these *promising practices* sites around the state are working hard to create motivating contexts for learning that increase academic rigor and promote literacy development. Students clearly benefit from these efforts.

Career and Technical Education
Promising Practices Initiative

Sponsored by the Maine Department of Education,
Division of Career and Technical Education,
and the Maine Association of Career and Technical Educators

Featured Promising Practice:
Academic/Literacy Integration

Maine CTE Centers
working with this *Promising Practice*:
Bath Regional Vocational Center
Caribou Regional Technology Center
**Presque Isle Regional Career
and Technical Center**

October 2006

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PROMISING PRACTICE: *ACADEMIC/LITERACY INTEGRATION*

Description

Academic and CTE teachers collaborate to ensure that academic content is integrated into CTE program areas. CTE courses carry academic credit because they contain rigorous academic content and are aligned with the Maine Learning Results. Students are highly engaged because they are learning academic content within the context of their CTE program area.

Why Is This a *Promising Practice*?

Studies have shown that students understand and retain knowledge best when they have applied it in a practical, relevant setting (Daggett, 2005). According to Daggett (2005), at the high school level, career and technical education programs provide the most effective learning opportunities. “Not only are students applying skills and knowledge to real-world situations in their CTE programs, but also they are drawing on knowledge learned in their core subjects. Students who participate in CTE programs should be well prepared for state exams because the academics they learn are used in Quadrants B and D. The key is to tie those academics to core content areas. In this respect, CTE teachers can be a great help to language arts, math, and science teachers by reinforcing the skills and concepts that students learn in those subjects.”³

According to Roberson, Flowers, and Moore (2001), vocational and academic integration has been supported by the teaching profession and business and industry. “The concept of vocational and academic integration has been endorsed by the U.S. Office of Education since the mid-1930s (Moss, 1990). Gable and Ransdell (1993) stated that the concept of vocational and academic integration is supported by educators, business and industry, and government policy makers. Pritz and Davis (1990) emphasized the equal importance of both academic and vocational skills. They identified both types of skills as being essential in the workplace so workers would be flexible enough to solve problems and keep up with new technology. Capelli (1990) also stated that both academic and vocational skills were important for students’ success in the job market. According to Tremaine (1992), vocational and academic curriculum must integrate in order to meet students educational needs and make education more meaningful and relevant.”⁴

Taylor (2001) summarizes others’ conclusions: “Beane (1998) suggested that the importance for curriculum integration is evident through the growing support for active learning and construction of knowledge, through the interest in patterns of the brain process as they relate to learning, and through current research supporting constructivism. According to Brown (1998), learning in context and the construction of knowledge through prior experiences are two concepts that relate to integrating academics, career, and technical education.”⁵

³ Daggett, W. R. (2005). Achieving Academic Excellence through Rigor and Relevance. Paper published on the International Center for Leadership in Education website. Accessed July 26, 2006 at http://www.daggett.com/pdf/Academic_Excellence.pdf

⁴ Roberson, D. R., Flowers, J. L., & Moore, G. E. (2001). The Status of Integration of Academic and Agricultural Education in North Carolina. *Journal of Career and Technical Education*, 17(1). Accessed July 26, 2006 at <http://scholar.lib.vt.edu/ejournals/JCTE/v17n1/roberson.html>

⁵ Taylor, C. B. (2001). Teachers’ and principals’ perceptions of precursors to integrating academic and career and technical education. Virginia Polytechnic Institute and State University. Unpublished doctoral dissertation. Accessed July 26, 2006 at <http://scholar.lib.vt.edu/theses/available/etd-06122001-110038/unrestricted/ Dissertation VERSION2.PDF>

Taylor (2001) characterizes three primary formats for academic integration into CTE classes or programs: 1) academic and career/technical education instructors team teach classes, 2) day-to-day instruction incorporates academic and career and technical skills, and 3) class projects are jointly sponsored by academic and career and technical education teachers.⁶

Taylor (2001) also outlines four types of strategies that support academic integration:

- Instructional strategies
- Curricular strategies
- Collaborative strategies
- Administrative practices and procedures⁷

What Does It Look Like in Maine?

In Maine, three CTE centers are working to promote academic/literacy integration into specific CTE programs. The three mini-case studies that follow describe how the centers are working with the strategies that Taylor (2001) outlines in the summary above. Two of the centers began their focus on academic integration in the past year while one of the programs is in its fourth year of implementation. Next steps are listed for each.

⁶ Taylor, C. B. (2001). Teachers' and principals' perceptions of precursors to integrating academic and career and technical education. Virginia Polytechnic Institute and State University. Unpublished doctoral dissertation. Accessed July 26, 2006 at <http://scholar.lib.vt.edu/theses/available/etd-06122001-110038/unrestricted/DissertationVERSION2.PDF>

⁷ *ibid.*

Promising Practice in Action: *Academic/Literacy Integration*

Bath Regional Vocational Center (BRVC)⁸
Bath, ME

Jon White, former Director (recently retired)
Merton Dearnley, Director

- **Location:** Integrated locations on both sides of Morse High School.
- **Student population:** 220 (others take some classes but are not enrolled in CTE programs)
- **Sending schools/districts:** 4
 - ▶ **Program focus:** Partnership with Morse High School to integrate science into four CTE program areas—health/sciences, auto technology, computer-assisted design (CAD), and building construction. Students receive one half-credit science elective each year and can fulfill the 3rd year of the science requirement in two years.

Jon White, the former director, said he was a little hesitant to apply to be a *promising practices* site because the project at BRVC was just getting underway. But he was excited about what was happening and wanted to “get it out there.” He thought it was impressive that one of Morse science department’s listed accomplishments for the year was a focus on academic integration into CTE classes. He thought that the enthusiasm of the CTE teachers was worth noting.

Getting Started

Two years ago, some BRVC teachers attended Alan Dearborn’s session at the Maine Association Vocational Education Administrators (MAVEA) conference and got inspired. Soon after, there was a Wednesday morning curriculum meeting and CTE instructors were told to join one of the academic departments. The science department welcomed the CTE teachers and the conversation began. CTE teachers from different program areas (auto technology, building construction, health occupations, drafting technology, and computer technology) met with members of the Morse science department and compared notes on what they were each doing in their courses.

What It Looks Like in Action

During the 2005–06 school year, several curriculum-related events took place that involved collaboration between the science department and the CTE teachers. All freshmen explored the science of airbags; academic students learned how to do CAD representations of molecules and catapults; and automotive classes worked with the physics of hydraulic lifts. The CTE health sciences instructor and the teachers of biology and health classes at Morse High School also collaborated on some lessons. In addition, the science department and BRVC co-wrote and received a GIS grant for \$40,000 worth of mapping software. Science credits were negotiated for selected BRVC courses.

The teachers know the program needs to evolve—and they want it to. Two teachers would like to co-teach the pre-engineering class. The auto technology teacher said he would like to go to a physics or chemistry class and “see how they teach ‘specific gravity’ and come up with a lab. And then my kids could go to class and their kids could come to my lab.” The building trades teacher has been discussing an interdisciplinary project for next year: designing a super-insulated house. According to the teachers on both sides, willingness to collaborate was not an issue, but finding meeting and planning time was a challenge.

⁸ This mini-case study is based on conversations with BRVC and Morse High School staff, review of documents, and data collected during an onsite visit in May 2006.

CTE and science department teachers indicated they would like to define what types of science experiences should take place each year with each class, and how these experiences would help students address the Maine Learning Results. They would like to make sure events that do occur are as rich as possible for all of the students. For example, in automotive technology earlier this year, freshmen science classes imploded air bags, took a variety of measurements, and made deductions about chemical reactions. “The lesson was good,” said the science teacher, “but we should have had the CTE classes learning more of the science instead of just setting up the lab.” The CTE teacher agreed: “We wired up the airbags but we didn’t work on the academic side; and they didn’t do the set-up. We have to figure out ways to have more impact for both groups of kids.”

Lastly, CTE teachers indicated they want to make sure that, where applicable, students will get the credit they deserve for the integrated academic content they learned in their CTE classes. The group of BRVC teachers involved with this project recognized that preparing students for the 21st century workplace means integrating rigorous academic content and literacy skill development into CTE program offerings. If they commit to making sure this occurs, they want students to receive academic credit and not have to repeat the same content in another setting. “There is too much to learn to be duplicating efforts. It shouldn’t matter which side they learn it on—they should get the same credit if it is the same content.”

Sustaining the Work

Institutionalizing the work will require four steps (as outlined by the BRVC Advisory Board and Student Services Advisory Council):

- Integrate core benchmarks within BRVC programs.
- Establish a timeline to address further integration implementation.
- Propose a method of updating processes as needed.
- Evaluate process in order to promote relevance and rigor.

At issue is the right of students to access quality learning in CTE settings that will adequately prepare them for the 21st century workplace. BRVC educators have worked on this—but recognize there is a lot of work left to do.

Reciprocal Teaching

While talking to the science and CTE teachers, there was a clear respect for one another’s knowledge and work. It was not about science teachers teaching in CTE classes, but, instead, bringing the classes together and co-teaching the concepts from two perspectives. Some science teachers brought their academic classes to the “labs” (shops) on the CTE side to learn. “Well, really, it’s to play with all of the cool stuff!” laughed one science teacher. Relationships developed between CTE and academic teachers. Both the former CTE director and the high school principal talked about a vision where the divide between the two continues to diminish and rigorous motivating contexts for learning are found as the norm on both sides. The high school principal said she is very excited about the partnership and hopes it expands to other departments.

Teachers on both sides noticed what has happened thus far. Meetings were planned with the English and math departments and CTE teachers to explore opportunities for similar types of academic integration with those departments and specific CTE program areas. Students noticed, too. Many more showed interest in CTE classes since the academic classes began “going over to the other side.” One student mentioned she plans to take the CAD class next year because of her experience with doing the molecular modeling in chemistry class this year. She said she did not even know there were classes like that offered at the high school level. In fact, enrollment in the next year’s CAD classes was up 250% according to the science

department chair who attributed this to greater exposure through the science classes and the opportunity to earn science credit by taking selected BRVC courses.

Improving Literacy Development

Two of the teachers at BRVC participated in the CTE Literacy Mentor Project, tried out and adapted literacy support strategies in their classrooms, and were responsible for presenting content-area literacy workshops to their colleagues at school. One of the mentors mentioned the importance of modeling for students how they read and how they use vocabulary because “they might not have those models at home.” He talked about how using the strategies has made a difference in how students make connections in really simple things like teaching the vocabulary before he assigns the reading: “It makes a big difference!” In the other mentor’s classroom, students read using a graphic organizer with an article about a war veteran who is an amputee and has to get a car with an automatic rather than a manual transmission. A variety of trade magazine covers and articles were posted on the bulletin board. The former CTE director indicated that he wants the CTE center to be a resource for the sending high schools so they can see how literacy development can and should be integrated into all content areas: “It’s so important, it’s really critical.”

In the health sciences classroom, the teacher explained, “It’s all about the fact that you have reading material in your professional trade or technical area, stuff that you need to know.” She mentioned that the CTE context is a good place to work on literacy because of the relationships teachers have with students and the interest students have in the content. The teacher described the clinical review papers students were asked to do using a specific format each Monday to reflect on what was learned at their clinical placement. If students missed a day at their placement, they were asked to read and respond to a relevant article. Periodically, the whole class was assigned an article to review and evaluate in light of what they know. A specific template was provided to ensure that students responded to the reading thoughtfully. The health sciences classroom was filled with student-made and commercial posters. Students were quizzed one another on vocabulary terms; there was a medical terminology jeopardy board on the wall.

Next Steps

- Define what types of science learning will be expected to occur in each CTE class and what types of activities will help students develop that understanding.
- Establish ways to measure whether students are learning the science concepts that are being integrated into their program area.
- Develop similar avenues and supporting credit systems to allow English and math integration to also take place and be valued as part of BRVC program offerings.
- Ensure that literacy-rich environments, with trade magazines and knowledge and application of literacy support strategies, to develop reading, writing, speaking/presenting, and critical thinking skills are occurring regularly in all CTE programs.
- Review program expectations to ensure they are uniformly high and publish the relevant literacy habits and skills students will work on in each CTE program area.
- Resolve articulation and credit agreements with all sending schools.
- Select a reading assessment or ask all sending schools for data on students’ reading levels.
- Discuss collaboratively how sending schools could better prepare students for upper level work at the CTE center or at their home high schools.

For more information, contact Bruce Scally, Student Services Coordinator; Peter Gagnon, Cindy Harris, or Dean Emmerson, BRVC teachers.

Promising Practice in Action: *Academic/Literacy Integration*

Caribou Regional Technology Center⁹

Caribou, ME

Lynn R. McNeal, Director

- **Location:** Independent building adjoining Caribou High School
- **Student population:** 360
- **Sending schools/districts:** 6
- ▶ **Program focus:** Partnership with Caribou High School to integrate science into six CTE Program Areas—industrial construction, large equipment maintenance and operations, commercial driving licensure, automotive repair, auto-body (collision), and welding. Students get one science credit for chemistry upon completion of each two-year program, thus fulfilling the requirement.

Getting Started

Alan Dearborn began as a science teacher “on loan” to the Caribou Regional Technology Center during the 2002–03 school year. The Caribou High School science department quickly recognized the need for a third year of science to ensure all students met the Maine Learning Results, but also recognized that it would be impossible for CTE students to fit in their schedules. Academic achievement was a concern, but so was student access to CTE programs. A plan, supported by the high school principal, Dave Ouellete, and the CTE director, Lynn McNeal, was devised to integrate academic science content into CTE program area classrooms. Dearborn would be relieved from teaching high school courses for two periods a day to go and work with CTE teachers and teach science content that related to the CTE program area. The assessments for high school students and CTE students were the same Level II assessments.

CTE teachers responded positively—they did not see this as a loss but as a way to enrich their programs through relevant science content. Science was integrated into six two-year CTE program areas: industrial construction, large equipment maintenance and operations, commercial driving licensure, automotive repair, auto-body (collision), and welding. By participating in those programs for two years and by having Dearborn provide science-related instruction for one period per week, one year of students’ three-year science requirement was waived. Four years into the process, Dearborn is still working on new lessons to add to the 87 lessons already developed. A sequence of lessons is keyed to teach and/or reinforce physical science concepts. Dearborn tracks the lessons that were taught in each class each year to document the chemistry concepts that were addressed. Several lessons are the same content-wise across programs but the application piece differs. For example, demonstrating an understanding of energy in chemical bonds might be explained through a study of adhesion/cohesion/bonding and glues and/or through an examination of the combustion of vapor. All lessons developed to date are plotted on a lessons/standards grid so the content of the academic integration can be easily checked.

What It Looks Like in Action

Science lessons began with high interest activities that give Dearborn immediate credibility with the students. He then connected the activity to the science behind it and worked with the students to apply the concepts directly to what they were working on in the shop. For example, he exploded dust with the auto-body class and did vapor explosions, discussing why bonds

⁹ This mini-case study is based on conversations with CTE and high school staff, CTE students, review of documents, and data collected during an onsite visit in June 2006.

harden and paint dries. Dearborn planned the curriculum so he can “hit the same topic in different ways over the course of the year.” In the large engine class, for example, he worked with air–fuel ratios during several sessions in a variety of different ways. Dearborn had the same planning period as the CTE teachers—8th period—so he could meet with the instructor, review upcoming terminology, discuss what was happening in the shop, and plan to connect the lesson as much as possible to the “lab situation” the shop provided.

Keys to Success

The director and the CTE teachers agreed that Dearborn has great rapport with the five instructors, possesses a lot of knowledge, relates with the students, works well with the teachers, and is very flexible. Informal interviews with some of the CTE instructors generated the following comments:

Electricity, that was a good one. I think this year we really did it well—we actually wired up the playhouse and talked about current and electricity. It makes sense when it is relevant.

He’s a real hands-on kind of guy—that’s what it takes to make it happen. He takes the science and does a real good job of relating the science end of it. The kids end up using a lot of the terminology.

I think he is very well received—you know, he is like Bill Nye the Science Guy—he makes it real and he definitely keeps their attention. If I had had the science when I was in the program, a lot of the stuff I found out over time would have been learned right here—stuff I had to learn by reading the trade magazines. I think this gives students a concrete base to work from.

What Students Said

Students seemed to agree. One auto-body student said that the science “relates a lot of the time” to the trade area. That same student gave an example: “He’s teaching us a lot about bases and acids and I learned that overcharged batteries can explode. We have to know that kind of electrical stuff when we are working on interiors so that’s helpful.”

I like it much more than [another science class] I had to take. He talks about things that relate like pigment and paint. One time he had four vials—town water, a base, an acid, and salt water—and asked us to predict which would take the fastest to rust a piece of metal. It was the town water—acid rain eats up the metal—within a week it rusted all the way through. I couldn’t believe it.

I liked the lesson on the electrical stuff. We took wires and three lights and did serial hookups and saw different ways to hook them up. So that was good—we could learn what to do with the electrical under the dash after a crash—it really relates to what we do.

Use of Data

The CTE center uses CTBS and TerraNova test data to determine where students are in terms of academic skills. All students are expected to score at least 85% on the basic competency test. Tutoring services are provided in response to students’ needs.

Other Academic and Literacy Supports in Place

All students at Caribou High School read and journal for 45 minutes during their English period on Thursdays—something that the CTE director said has made a positive impact on the school’s culture. According to McNeal, there is “a culture of high expectations in place.” There has been a collaborative staff development team made up of high school and CTE teachers and administrators dating back to the mid-1980s.

Evidence of Student Learning

Hard evidence of student learning is more difficult with the assessment program on “pause.” Initially, Dearborn developed and tested Level II assessments with academic and vocational students. For example, on an assessment for acids and bases, Dearborn indicated 80% of the CTE students met the standard. “But the instruction was different—over here, I could tie it to auto-body, etc.” He noted that 85–90% of the CTE students were able to build a 3D model of characteristics of the periodic table and answer questions about it. The third assessment on conservation of matter also had a high student success rate. There was a shared sense among administration, teachers, and students that learning science this way is a good approach. Some students asked to take their science through the CTE center instead of taking another academic science class.

Next Steps

- Develop a way to track evidence of learning of science concepts and of success given that the assessment system is currently paused. Add science items to CTE tests in the six program areas.
- Keep developing lessons that are increasingly keyed to what CTE instructors need.
- Work on articulation of science concepts addressed during the junior versus the senior year.
- Think about how to increase the literacy development piece of the science lessons—this would help improve learning and assessment. Use of quick writes, coding when reading, note taking graphic organizers, vocabulary strategies, and anticipation/reaction guides may fit well.
- Work on sending school reciprocity, agreements, and credits.
- Make sure all CTE program areas have at least two different trade journals; enough for a class set. Use these to reinforce or augment the science lessons.

For more information, contact Lynn McNeal, Director, or Alan Dearborn, Caribou High School Science Teacher.

Promising Practice in Action: *Academic/Literacy Integration*

Presque Isle Regional Career and Technical Center (PIRTC)¹⁰

Presque Isle, ME

Melissa Vance, former Director (recently retired)

Larry Fox, Director

- **Location:** Adjacent to Presque Isle High School
- **Student population:** 285 (almost all are from Presque Isle High School)
- **Sending schools/districts:** 7
 - ▶ **Program focus:** Integration of literacy and academic rigor into the Agri-Science program.

There has been an agricultural science program at PIRTC since 1991 but the academic side of it has not been emphasized. However, the district's Educational Farm and related businesses (nursery, cidery, orchards, farm stand, wholesale fruit) have received much attention. In response to enrollment trends and discussions about academic requirements resulting from the Maine Learning Results, it was decided that the academic side of the program needed to be substantively revised.

Getting Started

Under the direction of the former CTE director, a new program lead teacher was hired in the summer of 2005 and her first task was to redesign the core science courses into a two-year *Applied Science* course sequence that would:

- Meet all four life science content standards of the Maine Learning Results
- Add needed academic rigor to the curriculum
- Integrate literacy development into the program

Students who take the two-year sequence of *Applied Science* courses are assessed using the same assessments as Presque Isle High School biology students and receive a Life Science credit. In addition, they get substantive hands-on experience through real-life agricultural experience in the laboratory, greenhouse, or school farm. Additional courses in the program include agricultural application courses (aquaculture, agricultural production, and natural resources conservation). Leadership and work experience classes complete the curriculum.

The 2005–06 academic year was the first year the new curriculum was implemented.

Literacy Integration

Literacy development was integrated into the *Applied Science* classes in several ways during the 2005–06 school year. The classroom environment where instruction took place was literacy-rich. In the two connected rooms, the shelves were full of textbooks, trade journals, and reference books. On the walls there were posters, pictures of the farm and the science fair, and signs. One room had a bank of computers. A "quote of the day" was displayed on a flip chart. Magnetic poetry was on the white board. A lab safety word/phrase wall was in the back corner of one room. An events calendar and newspaper clippings were on a side wall. One of the instructors remarked, "I don't understand how you can teach anything without teaching literacy." Approaches to literacy integration included:

¹⁰ This mini-case study is based on conversations with PIRTC staff, document and student work review, and data collected during an onsite visit in June, 2006.

- *A focus on vocabulary.* Students received assigned vocabulary at the beginning of the chapter. Students also obtained a comprehensive list of scientific suffixes and prefixes with meanings and examples which they added to throughout the year.
- *Web-based Scavenger Hunts.* Students were asked to complete several web-based scavenger hunts that required skimming, reading for information, analyzing, and synthesizing. Topics for 2005–06 included *herbs*, *biotechnology*, and *the human genome project*.
- *Note taking*
- *Reading aloud*
- *Use of leveled lab manuals.* The lab manuals that accompanied the biology textbook used in the course came in two ability levels and helped the instructor address the high percentage of identified students in *Applied Science I* (50%) and *Applied Science II* (10%). The textbook was a standard biology text published by Prentice Hall.
- *Additional reading beyond the text.* Reading and responding to trade journals, Internet articles, and readings in other texts was expected during the year.
- *The Science Fair Project*

All *Applied Science* students participated in an Agri-Science Fair Project, held for the first time during the 2005–06 academic year. This new program component, described in the Program of Studies, required students to investigate an issue in agricultural science and design an experiment using the scientific method. Students completed written papers documenting their methods, findings, and conclusions, and each created a display of results on posterboard trifolds. Projects were judged “according to how well the students followed the scientific method and were able to display and explain their months of work” (Program of Studies, 2006–07). What was unique about this long-term assignment was the scaffolding provided—even students with weaker reading, organizational, and writing skills were able to be successful. Students received feedback on each component all along the way. Clear guidelines with eleven steps described what students were to do between mid-October and the fair in mid-March. State and national FFA science fair standards were incorporated into the project criteria. The expectations were high and the teacher reflected that many students needed to recreate several pieces more than once.

Projects were completed in the scientific areas of botany, zoology, micro-biology, engineering, natural resources, biology, and agriculture and included exploration of such topics as deer feeding, cooking sprays, potato storage, and plant fertilizer effects. While it was clear some of the students had more difficulty with expressing themselves in writing, and some experiments were much simpler than others, an examination of posters, pictures documenting the process and the fair, and discussions with the instructors made it evident this project had supported students to develop general academic literacy skills—*reading, writing, presentation, and critical thinking skills*—as well as to develop scientific literacy skills—*an improved understanding of the scientific method, scientific texts, and formats*.

Improved Academic Rigor

In several ways, the *Applied Science* classes were more academically rigorous than the Agri-Science classes they replaced. First, an *applied science* textbook was used instead of the earlier agriculture textbook. The course design was more rigorous because of the need to address the life science standards and included more hands-on scientific applications as part of the curriculum. The increased assessment requirements, note taking requirements, science fair requirements, and general reading and writing requirements also added rigor to the course expectations. In addition, the class periods at the farm were limited and those that occurred included *applied science* lessons as well as work experience.

Next Steps

- Establish a career portfolio requirement for Agri-Science students.
- Ensure that all Agri-Science students complete at least two science fair projects.
- Incorporate more literacy development strategies into instruction, such as the use of triple-entry vocabulary journals; notetaking strategies other than copying of notes; paired or rehearsed reading; and use of editing checklists.
- Discuss the appropriate population for the program, course articulation, and credits with sending schools.
- Review other CTE program areas to determine if they might benefit from greater academic and/or literacy integration.

For more information, contact Larry Fox, Director, or Shelly Gross, Agri-Science Program Leader.

Career and Technical Education
Promising Practices Initiative

Sponsored by the Maine Department of Education,
Division of Career and Technical Education,
and the Maine Association of Career and Technical Educators

Featured Promising Practice:
Career Academies

Maine CTE Center
working with this *Promising Practice:*
Lewiston Regional Technical Center

October 2006

Promising Practices descriptions and mini-case studies developed by
Julie Meltzer, Director of Literacy Research and Development for
Public Consulting Group's Center for Resource Management, Portsmouth, NH.

PROMISING PRACTICE: CAREER ACADEMIES

Description

Students select an integrated program of academic and CTE courses that focuses on preparation for a specific career area. Coursework includes community-based learning experiences, alignment of academic learning standards, and expectations to achieve rigor and relevance in student learning.

Why Is This a *Promising Practice*?

There is a growing consensus in the business community that today's employers want workers to use initiative and solve problems, skills previously associated with employees who had been to college and had a good academic foundation in subjects like statistics. Plank (2001)¹¹ suggested that an integrated curriculum provides students with a strong academic program and a foundation in work applications so they can pursue a variety of levels and combinations of work and college. Zinser and Poledink (2005)¹² claim that "such a program may also offer other motivational benefits like greater relevance of academics, working harder in academics, and more commitment to school in general."

According to Edling and Loring (1996)¹³, a major objective of education should be to keep open a range of options for students, not to force a false choice between skills for work or academics for college. Zinser and Poledink make a strong case for the idea of integrated pre-professional *programs* (i.e., courses of study) beyond the insertion of academics into specific applied courses. "Even though there is a well-developed body of knowledge for core academic subjects—and it seems to make sense to teach them in isolation—the reality of modern life emphasizes context, relationships, and wholes, which is best exemplified by occupations. So teaching academics in the context of a profession such as engineering provides a framework for higher, reflective learning which includes analysis, synthesis, and systems thinking; and teaching engineering using a foundation of academics and process skills helps students grasp and apply the concepts from both areas" (Zinser & Poledink, 2005)¹⁴.

Establishing a career academy allows educators to take the best of academic and CTE programming and develop a thoughtful, high quality sequence of experiences that will truly prepare students for a wide range of career and educational options related to a field of interest.

What Does It Look Like in Maine?

The mini-case study below describes how one Maine CTE center has developed two career academy programs in cooperation with its primary sending high school. Students in 10th, 11th, and 12th grade participated in the career academies. The program admitted its third 10th grade cohort and will generate its first graduates in the 2006–07 school year.

¹¹ Plank, S. (2001). *Career and technical education in the balance: An analysis of high school persistence, academic achievement, and postsecondary destinations*. St. Paul, MN: National Research Center for Career and Technical Education, University of Minnesota.

¹² Zinser, R., & Poledink, P. (2005). The Ford Partnership for Advanced Studies: A New Case for Curriculum Integration in Technology Education, *Journal of Technology Education*, Vol. 17, No. 1. Accessed July 26, 2006 at <http://scholar.lib.vt.edu/ejournals/JTE/v17n1/zinser.html#plank#plank>.

¹³ Edling, W. H., & Loring, R. M. (1996). *Education and work: Designing integrated curricula. Strategies for integrating academic, occupational, and employability standards*. Waco, TX: Center for Occupational Research and Development.

¹⁴ Zinser, R., & Poledink, P. (2005). The Ford Partnership for Advanced Studies: A New Case for Curriculum Integration in Technology Education, *Journal of Technology Education*, Vol. 17, No. 1. Accessed July 26, 2006 at <http://scholar.lib.vt.edu/ejournals/JTE/v17n1/zinser.html#plank#plank>.

Promising Practice in Action: *Career Academies*

Lewiston Regional Technical Center (LRTC)¹⁵

Lewiston, ME

Dr. Don Canaan, Director

- **Location:** Attached to Lewiston High School
- **Student population:** 800+
- **Sending schools/districts:** 6
 - ▶ **Program focus:** Two career academies—the School of Engineering Technology and the School of Health Sciences—staffed collaboratively with Lewiston High School and located at LRTC.

LRTC's mission statement reads, in part, that the staff "is committed to preparing students to be lifelong learners and providing them with educational opportunities and choices. Guided by Maine's Learning Results, we hold high performance expectations for ALL students." The description of each program area in the course catalog includes a list of the vocational aptitudes and competencies, academic pre-requisites, and literacy and math skills students will need to be successful. The program descriptions also provide the lexile score of the average materials students will be reading in each program. A high level of engagement and *application* of skills is just as important. "Working in partnership with our local businesses and industries, LRTC provides an excellent array of opportunities for internships, apprenticeships, cooperative education venues, and community-based training sites. This active engagement, together with a challenging academic program, is critical to the educational success for the 21st century" (LRTC Web site). Having high collective expectations, providing 27 program options, and focusing on achieving a common vision seems to have paid off: according to the school's five-year follow-up data, over 50% of graduates earned their college degrees and more than 70% were working in an area related to their LRTC program.

Dr. Don Canaan, LRTC director, is enthusiastic about everything the school has to offer. But when he discussed LRTC's newest program offerings—two career academies—the School of Engineering Technology and the School of Health Sciences—his eyes lit up. Designed to fuse rigor and relevance, the curriculum for each was carefully planned to prepare students for the college and workplace demands of the technology, engineering, and health sciences fields. Launched during the 2004–05 school year, both schools will produce their first graduates in 2007.

Common Design Elements of Both Career Academies

"Best practice" design elements common to both schools include:

- Groups of students work together with the same team of teachers for three years in a highly supportive, high achieving environment.
- The curriculum design organizes instruction around health and science themes or engineering topics.
- Programs support the requirements for college entrance while allowing students to acquiring practical, work-related knowledge and skills.
- There is a collaborative effort in partnership with post-secondary education, local industry, and with community programs.

¹⁵ The mini-case study is based on multiple conversations with LRTC staff and students, an onsite visit in May 2006, and extensive document review.

- Programs aim to be comprehensive learning experiences that will have “rigor, relevance, and relationships to learning” (Tony Wagner).
- Instruction is based on research of “best practices”.
- Advanced Placement courses are offered free of charge.

The School of Engineering Technology

The School of Engineering Technology, in partnership with the National Alliance for Pre-Engineering Programs, offers a rigorous curriculum modeled after “Project Lead the Way” (PLTW), a national pre-engineering curriculum. “The curriculum uses project-based, hands-on experiences to teach students the key elements and skills of engineering and technology-based careers by immersing them in real-world engineering problems” (PLTW brochure). The purpose of the school is to prepare students for “engineering and engineering technology careers requiring post-secondary education at a college, university, community college, or technical school.” LRTC’s program design included input from engineering consultants and advisors from both industry and higher education.

Students in the three-year sequence of courses take a full academic load at Lewiston High School with an emphasis on science and core CTE courses at LRTC: introduction to principles of technology; pre-engineering courses, such as digital electronics and DC power; computer-integrated manufacturing, automation, and materials handling; and complete an internship. Admission is by application and there is competition for the 30 slots available for each entering sophomore cohort.

The School of Health Sciences

The purpose of the School of Health Sciences is to prepare students for health careers requiring post-secondary education at a college, university, community college, or technical school. “Advantages of the School of Health Sciences include rigorous preparation for college, relating core academics to health care/science topics and integrated ‘hands-on’ learning experiences that enable students to preview their chosen career” (program brochure).

Promotional materials for the school note the present and anticipated shortages in the health care field and emphasize the variety of career paths available including internal medicine, physical therapy, nursing, dental medicine, radiology, and veterinary medicine. As in the engineering school, students take a rigorous set of prescribed academic courses with a science emphasis and core CTE courses including: an introduction to anatomy and physiology; a sequence of applied health sciences courses; and complete a practicum. Admission is by application and there is competition for the 21 slots available for each entering sophomore cohort.

What It Looks Like

One day in May 2006 in the School of Engineering Technology

- Six students sat behind computers in the CAD classroom working on individual design projects. One student was designing a play structure with a waffle design and a castle, another was working on an IPOD holder for the dashboard of a car. The instructor explained that everyone already completed the assignment to design a desktop organizer using a full design protocol—research of existing designs, drafting of three or four ideas, completion of matrix to decide on which design to choose, commitment to a design, reflection on the design process.
- Four students were working together on a manufacturing project on the programmable CMC milling machine. There was a problem with the quality control on the embossing of a stamping block. The pneumatic vise closed and the drill began to emboss the block. The problem was that the students wanted to automate the process but they had no way to open

the door. A second problem was the size of the block. The four-student team had two first-year and two second-year students. One student lifted the cover and checked the block. “Should we use a smaller block? Or should we use a regular block and just not use the helper? That’s what I did last time.” “Okay, you want to download that for me?”

- Fifteen students were working on computers in one-half of the large hydraulics lab. Motorized cars were running around the concrete floor. All of the computers were hooked up so the students could control motors, pistons, lights, and buzzers. Students talked with one another about the projects. The instructor shared her thoughts on teaching and learning: “If I tell them, they won’t remember. If it is really hard and they figure it out, they’ll remember. They learn from each other all the time. One kid figures something out and shows it to others. I learn things from them all the time...I spend less than a fifth of my time lecturing—the rest of the time I am reinforcing, providing resources and feedback.” The Honor Society inducted new members that day, so many students were dressed formally. When the announcement was made to come to the meeting room, about a third of the students in the room left.
- In the second year pre-engineering design class, nine students worked on more sophisticated projects using Inventor, a software program that allows them to draw each view of their 3-D design. Two students worked on a toy train set, another pair on a bowling game and pins. One senior worked on the design for a skateboard park. Another designed a ratchet set. The atmosphere in the room was casual but focused. The instructor knew each student and his/her work.

What Students Said

Students in the School of Engineering Technology:

“I want to be an engineer so this gets me into it. It’s not just lecture/talking but there’s lots of hands-on.” ... “Civil engineering was my favorite because we got to make a model and got to talk to real engineers who actually make stuff like that.”... “Once you build it, you can get it to work using the computer”... “I’ll stay in the program if it fits my schedule. I hope it does. My goal is to be some kind of engineer.”... “Next time I am going to figure it out first before I start designing!”

Students in the School of Health Sciences:

“I think the program gives you a foot in the door, gives you an upper hand when you apply to college or for whatever career you want”... “I had an idea that I would like this but now I have a set plan for the future. I am going to UNE and I’ll get my master’s and then become a PA [physician’s assistant]”... “I think it’s a good idea. Maybe you find out what you don’t want to do. I switched from PA to pharmacist.” ... “[This class] is easier than most classes because I am interested in it. It’s more hands-on—I like it better than most of my classes.”... “It’s great to have the same teacher. You can develop a really good relationship.”... “You have to want to be here. You have to be ready to work and to focus. You have to be able to get along with people and you have to be able to work independently and use free time to do the work and learn on your own.”

Literacy Integration

Students at the School of Health Sciences talked at length about the difficulty they were having with some of the academic literacy demands of the program—and these were top students! They spoke about the difficulty of writing the “systems pape,” a 5–15 page paper on a body system. As part of their coursework, students were expected to read the textbook, articles related to current events and health, and non-fiction books on relevant topics, for example, *Death and Dying*. When asked how the program could better prepare them, the comments were not about content or opportunities to do hands-on—according to the students, those aspects of the program are in good shape. Instead, several of the challenges mentioned by the students were literacy related. Students spoke about the need “to be able to learn things on your own

because the college professors won't 'spoon feed;'" and expressed concern about college writing—"grammar, quotations, integrating other people's views into your own writing." Students listed other concerns related to reading, and note taking: "being able to read more quickly and to stay focused when reading; how to take better notes"—"I write too much or too little; I need to know how to pick out the important details."

Don Canaan held that the literacy piece is critical. He noted the large number of high school students who enter 9th grade but do not graduate, and he believes weak literacy skills play a big role. He acknowledged that many teachers do not have many strategies to help students develop their literacy skills—on the academic or the CTE side.

Other Supports

LRTC has published the lexile scores of the reading materials in each program area. Beginning in the 2006–07 school year, students in the Health Sciences and Engineering Technology programs will largely share the same English and science teachers, and the classes in these academic areas will be more closely aligned with the CTE side of the curriculum. Students in the two schools have the same guidance counselor for all three years—the student services coordinator is also certified in guidance and provides coherence and communication among all parties—parents, Lewiston High School, students, and LRTC. Teachers in the two schools are highly knowledgeable, both in their content areas and in instruction, and have participated in professional development and additional coursework.

Next Steps

- Find more ways to increase the coherence between the CTE and academic sides of the program.
- Provide professional development to teachers on literacy strategies they can use to support literacy development within the two schools.
- Increase opportunities to work on reading, writing, and presenting within the context of each CTE program area.
- Improve access to the schools for students from other high schools besides Lewiston.
- Develop a systemic set of criteria to measure program progress and success.
- Improve credit articulation agreements with sending districts/schools.

For more information, contact Dr. Don Canaan, LRTC Director.

Career and Technical Education
Promising Practices Initiative

Sponsored by the Maine Department of Education,
Division of Career and Technical Education,
and the Maine Association of Career and Technical Educators

Featured Promising Practice:
**Literacy Teacher
Professional Development**

Maine CTE Center
working with this *Promising Practice*:
Mid-Maine Technical Center

October 2006

Promising Practices descriptions and mini-case studies developed by
Julie Meltzer, Director of Literacy Research and Development for
Public Consulting Group's Center for Resource Management, Portsmouth, NH.

PROMISING PRACTICE: *SCHOOL-WIDE LITERACY TEACHER PROFESSIONAL DEVELOPMENT*

Description

All CTE teachers at the same center participate in one or more forms of teacher professional development to build their capacity to improve students' reading, writing, speaking/presenting, and thinking skills within the context of their CTE program area. CTE directors support teachers to learn and gain confidence in using literacy support strategies as part of classroom instruction.

Why Is This a *Promising Practice*?

The teacher is the single most important factor in determining student performance (Alliance for Excellent Education, 2005).¹⁶ School leaders face the challenge of motivating, guiding, and supporting teachers to reach higher levels of performance. Good teacher professional development is essential to meeting this challenge.

The NSDC standards (2001)¹⁷ stress that quality teacher professional development should:

- Be focused on student learning and achievement.
- Be research-based with relevant content-area examples and applications, and opportunities to practice.
- Support the development of a professional learning community.
- Include a variety of formats designed to meet adult learning needs and help teachers meet school and district goals.
- Be adequately supported by school leaders and resources.
- Use multiple forms of data to guide and monitor improvement.
- Occur over time as part of a systemic plan for educational improvement.

Effective literacy professional development occurs over time and includes an introduction to literacy support strategies, modeling, practice, content-area examples, and planning for and discussion of applications in the classroom (Putnam and Borko, 2000).¹⁸ With adequate high quality professional development, CTE teachers can become adept at selecting strategies to use based on student needs; the demands of the curriculum; program competencies; or certification requirements. The impact of teacher professional development is likely to be greater if teachers participate in teams, cohorts, or pairs. Wide-spread teacher professional development contributes to the emergence of a professional learning community focused on literacy improvement (Irvin, Meltzer, & Dukes, in press).¹⁹

What Literacy Strategies Do CTE Teachers Need to Know?

CTE teachers need a toolkit of strategies that helps students to do the types of *reading, writing, speaking/presenting, and thinking* needed to be successful in their career choices:

¹⁶Alliance for Excellent Education. (2005). *Tapping the potential: Retaining and developing high quality new teachers*. Accessed July 26, 2006 at <http://www.all4ed.org/publications/TappingThePotential/TappingThePotential.pdf>

¹⁷The National Staff Development Council Standards can be found at <http://www.nsd.org/standards/index.cfm>.

¹⁸Putnam, R. T., & Borko, H. (2000). What do new views of knowledge and thinking have to say about research on teacher learning? *Educational Researcher*, Vol. 29, No. 1, pp. 4-15. Accessed July 26, 2006 at <http://edtech.connect.msu.edu/aera/pubs/er/arts/29-01/putnam01.htm>

¹⁹Irvin, J., Meltzer, J., & Dukes, M. (in press). *A leadership model for improving adolescent literacy*. Alexandria, VA: Association of Supervision and Curriculum Development.

- Strategies to improve reading skills so students can be independent learners (e.g., reading technical manuals and textbooks well enough to find information and apply the concepts; reading trade journals and articles on the Internet to keep up in their field; reading and applying information in documents pertinent to safety, procedures, and regulations).
- *Strategies to gain comfort and skill when communicating verbally and in writing* (e.g., writing medical records, resumes, customer service records, work orders, descriptions of services, proposals for work, letters; types of verbal communication might include team communication, appropriate and precise use of technical vocabulary, customer service, public presentations, mentoring of others, and demonstrations).
- *Strategies to develop analytical, reflective, and problem-solving skills* (e.g., diagnostic skills and protocols are required across most CTE fields; these and other critical thinking skills can be developed through hands-on instruction *in conjunction* with content-area reading and to deepen and broaden conceptual understandings and improve the quality of work).

Learning the Literacy Support Strategies

For CTE teachers, literacy support strategies must first be learned and then adapted to the subject matter at hand. Teachers—and then students—need to understand the purpose of each strategy and effective ways to use each with reading and writing. Some teachers need peer coaching, repeated exposure to the strategies, and/or opportunities to see content-specific examples. Others may be able to see how a general strategy can be productively adapted and applied to their program area.

Supporting Teachers to Use the Strategies

Supporting teachers as they learn new strategies for literacy teaching and learning is the responsibility of the CTE director. Directors can:

- Provide release time for professional development.
- Structure time for teachers to work together and provide opportunities for peer support.
- Communicate that literacy development is a focus at staff meetings, through newsletters or the school Web site, and through email.
- Clarify the expectation that teachers implement the strategies in their classrooms; otherwise, some students will practice reading, writing, speaking, and thinking and others will not.
- Support the development of a professional learning community focused on literacy improvement.

CTE directors who know the literacy strategies can recognize if and how they are being used. They can connect the use of the strategies to the school's vision of teaching and learning and preparing students for the 21st century, stressing that this preparation is a collective responsibility.

What Does It Look Like in Maine?

One Maine CTE center embarked on a staff-wide literacy professional development effort during the 2005–06 school year. The mini-case study describes the initial progress that has been made and plans for the 2006–07 school year. The mini-case study is followed by a description of professional development options and formats.

Promising Practice in Action: *Literacy Teacher Professional Development*

Mid-Maine Technical Center (MMTC)²⁰
Waterville, ME
Mark Powers, Director

- **Location:** Independent building adjacent to Waterville High School
- **Student population:** 400
- **Number of sending schools/districts:** 5
 - ▶ **Program focus:** Provide CTE teachers with adequate professional development so they can integrate literacy development into all MMTC program areas.

MMTC is NEASC accredited, offering 26 career and technical courses in its well-equipped 14 lab areas. Each technical program at MMTC has achieved National Program Certification for National Skills Standards or using State Licensing Standards. The director feels good about the numbers—comparatively a high percentage of students (about two-thirds) passed national or state certification tests, went on to post-secondary programs, and scored well on the school's assessment, the College Board's Accuplacer Exam.

Mark Powers and his staff recognized that meeting the 21st century demands of the career paths for which these students are preparing requires high-level reading, writing, and thinking skills. Therefore, they aimed to provide more “value-added related academics” in those areas. MMTC teachers, with the leadership and support of the director, began to explore ways to enhance teachers' capacities to improve students' reading and writing skills *as part of* CTE classes. Below is a summary of what MMTC has done and how they plan to build on this during the 2006–07 school year.

Multiple opportunities and expectations to attend literacy professional development during 2006. All MMTC staff, including administrators, participated in at least one workshop focused on literacy support strategies between January and April 2006. Many attended several. The director publicized literacy opportunities offered throughout the state and encouraged teachers to attend. All of MMTC teachers participated in one or more half-day workshops focused on content-area literacy strategies, including vocabulary development, note taking, reading comprehension, writing, or motivating students to read their textbooks offered through one of the sending school districts. Sixteen of the 20 MMTC instructional staff, including educational technicians, attended the summer literacy strategies sessions. Several of the summer workshops were facilitated by CTE teacher literacy mentors from throughout the state, including four MMTC teachers (see below).

Training of onsite mentors during the spring of 2006. The director submitted nominations for four CTE literacy mentors in the fields of auto repair, precision machining, computer technology, and culinary arts to be trained as mentors through the state-wide CTE literacy mentor initiative. During the spring of 2006, these teachers attended four full-day workshops and were responsible for trying out strategies in their classroom and developing content-specific applications of the strategies to support student learning in their program area. More training was planned for the fall of 2006.

²⁰ This mini-case study is based on multiple in-person meetings with Mid-Maine TECH staff, facilitation of workshop sessions attended by MMTC staff, document review, and two onsite visits between February and June of 2006.

Building on Existing Structures

MMTC had several structures in place, which helped the literacy professional development initiative to “take root” and become incorporated into the culture of the school. Every CTE program area requires students to complete a career portfolio that includes a resume, letter of application, and work samples. The handbook contains curriculum objectives for each program; many have literacy components. Student Daily Logs are required in each program area.

MMTC program areas are organized into four tech teams: construction, service, technology, and mechanical. In the CTE Literacy Plan for 2006–07, an increased focus on literacy will be infused into all of these. Two examples:

1. There will be a renewed focus on daily logs—the purpose of the logs will be to get students to reflect on what was learned that day in ways that require making connections; analyzing; comparing and contrasting; and so on. This could be done through exit slips or quick writes using Bloom’s prompts.
2. There will be an addition to the Career Portfolio—each quarter students will reflect upon a problem they came up against during their lab time and describe how they addressed it. Problems/solutions can be presented through pictures with captions, use of a PowerPoint presentation, or in writing. One of the four will be a presentation to the class.

Use of Data

MMTC was concerned that the data it had on students’ literacy skills was inadequate to plan for student needs and track the progress of the literacy initiative. MMTC director, Mark Powers, and some teachers initiated a regional dialogue about reading assessment with the region’s sending districts. As a result, MMTC will be using the Scholastic Reading Inventory to assess reading comprehension for all students that attend the technical school. Therefore, MMTC can look forward to getting a lexile score for every incoming student. This will enable MMTC teachers to meet with students and talk about using the more motivating contexts of the CTE center to work on their reading and writing skills if necessary. Computerized weekly student reports already alert students to missing work, so teachers are used to tracking student progress and providing feedback. MMTC has been administering and gathering data from student performance on certification tests and the Accuplacer Test for several years. As they have done in the past, MMTC staff will analyze 2005–06 student performance data and identify strategies to improve student achievement. Teachers will receive these recommendations at the beginning of the 2006–07 school year.

Clear Expectations

During the 2005–06 school year, there were expectations to attend professional development and try out some of the literacy support strategies. Next year, the expectations outlined in the CTE Literacy Plan for 2006–07 include:

- A focus on technical terminology in each program area. Each area will identify approximately 200 key terms and will actively work with 7–10 of those terms using vocabulary development strategies at least once per week. Three primary strategies may be used—triple-entry vocabulary journal, knowledge rating guide, and interactive word walls.
- A minimum of 30 opportunities throughout the year will be provided by each program area to read chapters or articles and work with them actively using the literacy support strategies introduced during professional development sessions. Teachers can obtain assistance finding articles and/or co-teaching. Two educational technicians on staff, Debbie Duncan and Ed Maroon, were asked to attend multiple professional development opportunities during the 2005–06 school year so they could provide on-site support to teachers.

Providing Support and Getting Staff Buy-in

The CTE Literacy Plan for 2006–07 lists a number of support measures:

- Develop a common language and strategies about literacy—16 staff members attended the CTE Summer Literacy Workshop.
- Assess all students to obtain reading lexile scores.
- Debbie and Ed will be available to assist/co-teach literacy strategies with instructors.
- At faculty meetings throughout the year, literacy strategies will be shared. Debbie and Ed will prepare follow-up on these strategies to share what staff is doing and keep the focus on literacy through emails or a newsletter.
- The literacy initiatives will be reinforced during teacher in-service days (on the Instructor and Ed Tech In-service Plan, time for CTE literacy is noted as a focus for October 5 and January 22).
- Teachers will be able to visit other centers that are using the literacy strategies.

The 2006–07 CTE Literacy Plan was collaboratively developed by the literacy team consisting of MMTC administrators, literacy mentors, and the two educational technicians who will be providing support. These staff members presented the plan to colleagues at the end of the year retreat. Ongoing support and encouragement to attend professional development opportunities has also helped as teachers have come back with practical strategies they can readily use in the classroom. Lastly, the goals and focus of the literacy initiative is connected to program area goals and concerns which helps staff see that this is not an “extra,” but a part of classroom instruction.

Evidence of Literacy Integration in the CTE Classroom

There was evidence that teachers who participated in professional development have changed their practice. During a casual visit to MMTC on one day in May, the following was observed, despite the teachers’ protestations that the students were not really “motivated” because it was the end of the year and that next year, with expectations starting from “day one,” it will be “a lot easier to get students on board with this literacy stuff.”

- An article, *Don’t Be a Copycat*, with an accompanying anticipation guide, was used in the graphic communications class. The teacher said students read an article about once a week. Regarding the anticipation guide: “Kids had seen it before at the sending schools. I wasn’t sure if the kids would know how to fill it out, but they had no problem.”
- In the construction classroom, an entire rack at the front of the room was filled with issues of *American Woodworking*, *Woodworkers Journal*, *Wood Projects*, and other trade journals. Outside the room, a sign said: “Building minds and bodies so they will build the houses of the future.”
- Two teachers reported they had done literacy strategies that morning in the classroom. The precision machining and computer technology teachers, both CTE literacy mentors, described two different literacy support strategies that assist students to read more thoughtfully and respond to what they read. One teacher said in mock dismay: “You missed my Think-Pair-Share! It went surprisingly well.”
- The culinary arts teacher, another mentor, talked about a strategy sequence students had recently completed that included watching a video, reading an article, responding to a problematic situation, presenting their solutions, and then reading the textbook chapter in pairs. The topic was salad preparation and E.coli.

Other indications include the following:

- All four MMTC mentors piloted and wrote descriptions of how they used a set of literacy support strategies for the upcoming summer institute.

- MMTC teachers who came to more than one workshop at one of the sending high schools provided clear examples of how they had used a semantic feature analysis, a word sort, and other strategies to build vocabulary, enhance content understanding, and improve reading comprehension.
- MMTC educational technicians commented at the end-of-the-year meeting how they had observed more and more use of strategies “even in the classrooms of some of the teachers who are not mentors.”

Next Steps

- Stay the course. Use the CTE Literacy Plan for 2006–07 to guide action during the school year. Revisit and revise at the end of the year as necessary.
- Be explicit with students, sending schools, and parents about the importance of this literacy initiative. Outline what each can do to help.
- Continue to work with sending schools to outline what supports are needed in 9th and 10th grade to best prepare students for CTE programs.
- Obtain technical assistance in three areas: complete an evaluation of the literacy demands of the certification tests; one-page lists of ideas of how to meet the expectations of the CTE Literacy Plan; and meetings with the literacy team once per semester to assess progress, troubleshoot, and problem-solve.
- Continue to offer professional development opportunities for new teachers and teachers just getting “on board.”
- Create a professional library for teachers to use.

For more information, contact Mark Powers, Director, or any of the MMTC Literacy Mentors: Reggie Grenier (Computer Technology), Becky Johnston (Automotive Technology), Mark Rancourt (Precision Machining), or Bill Robertson (Culinary Arts).

Options and Formats for CTE Literacy Professional Development

CTE directors have a variety of options to assist CTE teachers to improve their capacity to advance literacy development within the context of their CTE programs. The following approaches have all been successfully used and are recommended. Using a combination of two or more will enhance teacher success and shorten the time period before improvements in student performance can be noted.

The goal is to have teachers use literacy support strategies during at least 50% of their classroom sessions. This will ensure students receive adequate practice and instruction to develop skills. Use of literacy support strategies should not be an add-on or extra, but always planned to enhance understanding and application of content.

Onsite or Offsite Workshops, Institutes, or Conferences

- Make sure workshops are applicable to high school students, provide relevant examples or time to apply strategies to CTE contexts, and are not just “one shot deals.”
- One or two days of training are simply not enough to make a difference in classroom practice. Workshops tend to be most effective if offered as a series.
- If only some staff attend a workshop or conference, make sure there is time to report back to the rest of the staff.

Train-the-Trainer or Peer Coaching Models

- Certain teachers should get more training and then serve as peer coaches or mentors for colleagues.
- By working with the strategies and gaining a repertoire of personal experience with how to use and adapt them, mentors can provide examples of how they used and adapted strategies to colleagues.
- Peer coaching models use a protocol where teachers observe and support one another with the implementation of new strategies. Teachers co-plan, observe, and/or debrief with one another several times a year.

Use of an Onsite Literacy Coach

- This person might be on staff or possibly an outside consultant who provides a combination of workshops and working with teachers in their classrooms.
- Typically coaches work with teachers to:
 - ▶ Co-plan how to increase the literacy development in a unit or lesson.
 - ▶ Model use of a strategy in the classroom.
 - ▶ Co-teach the lesson or unit with the teacher.
 - ▶ Observe and provide feedback to the teacher when he or she tries out a literacy support strategy in the classroom.

Study Groups, Critical Friends Groups, Professional Learning Communities

- In-house ways to support further improvement of teaching practice through approaches such as:
 - ▶ Reading and discussing articles or books on literacy.
 - ▶ Collaboratively scoring and examining student work to determine instructional needs.
 - ▶ Sharing with one another how teachers are using the strategies.
 - ▶ Reviewing together assessment results to determine where extra focus on literacy is needed.

Keeping the Literacy Focus Front and Center

- Communicate a continued focus on the literacy improvement goal when talking and writing to parents, students, and teachers.
- Decide on a set of school-wide strategies that everyone uses; this helps to provide a common language and focus.
- Devote 10–15 minutes at each staff meeting to the description and sharing of the use of a literacy strategy.
- Report back to teachers the results of literacy walkthroughs.
- Assemble successful strategy lessons in a collaborative notebook or on a Web page.
- Identify what literacy habits and skills will be focused on across the school and in each CTE program area.

Professional Learning Communities

Teacher professional development needs to be structured to support the emergence of a professional learning community focused on literacy improvement. Such a learning community has:

- A common literacy vision.
- Common strategies.
- Common agreements about how and when strategies will be used.
- A collective process for supporting, reviewing, and revising the work.

The use of specific strategies and types of reading, writing, and speaking/presenting that teachers use are matched to student needs, the literacy demands of the curriculum, and/or the requirements of the assessment (certification test, state test).

Leadership Support

Many CTE directors can also benefit from professional development to enhance their ability to support the initiative. Topics leaders may wish to learn about include:

- An overview of the literacy support strategies so the director knows what to look for in classrooms.
- How to do a literacy walkthrough.
- Effective ways to use data to support literacy development.
- Program-wide agreements and structures that make a difference.
- Getting reluctant teachers on board.
- Identifying the literacy demands of certification tests.
- How to coach teachers.
- How to connect program competencies and industry standards to literacy development.

Career and Technical Education
Promising Practices Initiative

Sponsored by the Maine Department of Education,
Division of Career and Technical Education,
and the Maine Association of Career and Technical Educators

Featured Promising Practice:
Literacy Integration
Across the Curriculum

Maine CTE Centers
working with this *Promising Practice*:
United Technologies Center, Region 4
Mid-Coast School of Technology, Region 8

October 2006

Promising Practices descriptions and mini-case studies developed by
Julie Meltzer, Director of Literacy Research and Development for
Public Consulting Group's Center for Resource Management, Portsmouth, NH.

PROMISING PRACTICE: *LITERACY INTEGRATION ACROSS THE CURRICULUM*

Description

CTE teachers provide reading and writing instruction and opportunities/expectations to read and write in every course. CTE classes provide authentic contexts for literacy learning. Each CTE program area provides students with the opportunity to read a variety of types of text—articles, textbooks, Internet sites, manuals, etc. Academic rigor is promoted through asking students to read, write, speak/present, and think about projects they complete and the topics of study they address in their CTE program.

There are common literacy expectations for all program areas (e.g., common portfolio requirements; specified amounts and types of expected reading and writing; speaking/presenting requirements scored using a common rubric; use of common vocabulary development strategies) and specific supports to meet the types of literacy demands of each area (e.g., a focus on diagnostics and analysis; a focus on math literacy; a focus on reading; applying information from complicated tables and graphs). Metacognition, critical thinking, and problem solving are expected in conjunction with all reading, writing, speaking/presenting, and learning.

Why Is This a *Promising Practice*?

“Adolescents entering the adult world in the 21st century will read and write more than at any other time in human history. They will need advanced levels of literacy to perform their jobs, run their households, act as citizens, and conduct their personal lives. They will need literacy to cope with the flood of information they will find everywhere they turn. They will need literacy to feed their imaginations so they can create the world of the future. In a complex and sometimes even dangerous world, their ability to read will be crucial. Continual instruction beyond the early grades is needed” (Moore, Bean, Birdyshaw, & Rycik, 1999)²¹.

In the last few years, several policy reports in education, business, and government have drawn direct connections between literacy development and academic, career, and life success.²² Responding to the challenge of supporting all students to develop the literacy habits and skills necessary to meet the demands of the 21st century will require that schools think *systemically*. Leaving literacy development up to chance is not a good option. What is needed? Intensive interventions for struggling readers and writers coupled with deliberate ongoing literacy support in all classrooms and program areas are needed.

CTE centers face an additional challenge and responsibility to develop literacy habits and skills within the context of CTE classes. Many of the students who come to CTE centers are not strong readers, writers, and thinkers; in fact, they are referred to career and vocational education as an alternative hands-on learning environment. But, CTE centers also have an advantage—they can tie the need to develop literacy skills to career demands and they are a motivating context for learning for the students who attend. CTE centers have the ability to connect purpose, teach academic and literacy skills in context, and promote rigor and relevance simultaneously. This means that CTE centers have the potential to launch successful school-

²¹ Moore, D. W., Bean, T., Birdyshaw, D., & Rycik, J. A. (1999). *Adolescent Literacy: A position statement for the Commission on Adolescent Literacy of the International Reading Association*. Newark, DE: International Reading Association.

²² See, for example, the ACT Report (2006). *Reading for college and reading for work: Same or different?*; College Board (2004). *Writing: A ticket to work or a ticket out*; National Governor's Association (2006). *Reading to Achieve: A governor's guide to adolescent literacy*; Alliance for Excellent Education (2002). *Every child a graduate*; Partnership for 21st Century Skills (2004) *Learning for the 21st century*.

wide efforts that improve students' reading, writing, presenting, and thinking skills while preparing them for specific career paths.

Setting up a successful school-wide program requires simultaneous attention to many fronts. Irvin, Meltzer, and Dukes (in press)²³ say that leaders need to set up structures and policies to support both strategic interventions for struggling readers and writers, along with literacy development across all classrooms/program areas. They describe five actions that school leaders of a successful literacy initiative need to take:

- Have a good literacy action plan
- Support teachers
- Use data
- Build leadership capacity
- Allocate resources

Biancarosa and Snow (2004)²⁴ outline instructional and infrastructural elements key to effective school-wide efforts at improving adolescents' literacy skills. These include:

- | Instructional Improvements | Infrastructure Improvements |
|--|---|
| <ul style="list-style-type: none">• Direct, explicit comprehension instruction• Effective instructional principles embedded in content• Motivation and self-directed learning• Text-based collaborative learning• Strategic tutoring• Diverse texts• Intensive writing• A technology component• Ongoing formative assessment of students | <ul style="list-style-type: none">• Extended time for literacy• Professional development• Ongoing summative assessment of students and programs• Teacher teams• Leadership• A comprehensive and coordinated literacy program |

In the case of literacy integration, providing teacher professional development and on-site support for teachers and students will be essential. In the case of improving academic rigor, time, structures, expectations, and teacher knowledge will be key. Both involve new ways of thinking on the part of teachers, leaders, and students. Fullan (2000)²⁵ and others discuss the structures, policies, and resource supports that need to be in place to support cultural shifts from “doing business as usual.” Strong leadership is critical to build collaborative energy around the work and ensure that adequate and appropriate resources are there to support the effort.

What Does It Look Like in Maine?

In Maine, two CTE centers are putting this school-wide approach in place. The first of the two mini-case studies describes an initiative launched this past year. The second represents work that has been underway for several years. What differentiates this promising practice from others is the *systemic nature of the implementation from the beginning of the initiative*. That is, the work began with putting expectations and structures in place *across the school*.

²³Irvin, J., Meltzer, J., & Dukes, M. (in press). *A Leadership Model for Improving Adolescent Literacy*. Alexandria, VA: Association of Supervision and Curriculum Development (ASCD).

²⁴ Biancarosa, C., & Snow, C. E. (2004). *Reading next—A vision for action and research in middle and high school literacy: A report to Carnegie Corporation of New York*. Washington, DC:Alliance for Excellent Education. Accessed July 26, 2006 at <http://www.all4ed.org/publications/ReadingNext/ReadingNext.pdf>

²⁵ Fullan, M. (2000). *Leading in a culture of change*. San Francisco: Jossey-Bass.

Note: Implementation of this promising practice in each of the two centers involved elements of three of the other approaches described in the Promising Practices project (use of an on-site academic/literacy specialist, teacher professional development, academic/literacy integration). For both centers, the goals of increasing academic rigor and ensuring literacy development are highly intertwined.

Promising Practice in Action: *Literacy Integration Across the Curriculum*

United Technologies Center (UTC)²⁶
Vocational Region 4
Bangor, ME
Greg Miller, Director

- **Location:** North-central Maine on an independent campus
- **Student population:** varies between 450 and 550 students
- **Sending schools/districts:** 7 public and 2 private high schools
- ▶ **Program focus:** Increasing literacy development and academic rigor in every program area.

Greg Miller, UTC's director, was enthusiastic about what has been put in place school-wide to support increased academic rigor and literacy development. During the 2005–06 school year, a new expectation for students to spend 50% of their time on hands-on projects in the shop and 50% of their time on academics was put into place with a new speaking/presentation requirement, inclusion of some type of research/inquiry in all programs, and an explicit focus on critical thinking and problem solving. Although several instructors were already doing some or all of these, making implementation a school-wide effort changed the culture of the school. According to Miller, the changes were necessitated by the fact that students need to be prepared for the 21st century workplace. He explained that the curriculum is driven by industry and that the school listened carefully to the advisory board for each program, which is made up of local employers in that field. There was an emphasis on professionalism and on the ability to work independently. Most of the 17 programs focused on industry standards and certification requirements. "This led to some school-wide decisions. It's not that many of the teachers weren't already doing it, but that we now say we are doing it and making it more important to do. The 50–50 academic/hands-on split seems to be about right. If we go over 50% on the academic side, we'll lose them. If we do less, we're shortchanging them. They tolerate the 50–50 without choking on it."

What It Looks Like in Action

One day in May 2006...

- Teachers were happy to discuss what students have worked on and how they have tried to help students improve the quality of their work. Several described what they have planned to do next year to build on what occurred during 2006. A focus on critical thinking and problem solving was evident. A five-student team came in after break and continued, without teacher prompting or direction, to work together to solve a robotics problem. A student in the auto repair program asked a question and the instructor turned it right back to the student: "So what does that tell you? What are your options?" Students discussed how to frame the window in the super energy-efficient house project they were working on. This interdisciplinary project required research on insulation, mechanical systems, and heating systems. Blueprints were created on the computer. Two students discussed how to solve an animation problem. "I think you could try it in FLASH MX because when I did it, it worked and it gave me the flexibility to make the other motions I wanted [the character] to make." Three students were critiquing a music video that one had just produced. Their comments were specific and respectful and the student producer thanked them and worked on making some suggested changes at the editing board.

²⁶ This mini case study is based on information gathered from conversations with UTC staff, document review, and data collected during on-site visits in May 2006.

- That year all program areas at UTC required students to do presentations. Presentations needed to be keyed to the Maine Learning Results and a common rubric was used for assessment. In auto repair, for example, students were asked to select the topic in the 2nd quarter, do a rough draft in the 3rd quarter, and do the presentation and pass in a written report on what they did and what they learned in the 4th quarter. In a nearby darkened room, a student presented a PowerPoint presentation on hybrid cars. When the student asked if there were questions, other students asked several and a lively peer-to-peer discussion ensued. In culinary arts, the instructor described the one week, end-of-year presentation project: students select a product, research it, make a sample, develop a poster or a PowerPoint, and present the food to the class. Practice at public speaking came earlier during the year through serving customers in the restaurant.
- Posters relevant to each program area were on the walls. Some of the classrooms had word walls. Some teachers asked students to read articles from trade journals, although most saw this as “an extra.” Many teachers assigned chapters in the text and asked students to answer the questions. Vocabulary development, expectations about the presentation, and use of strategies were all decided by each individual teacher. There was enthusiasm for working on literacy development among many of the teachers. But teachers needed to expand their repertoires of strategies so they would have more tools to support students’ growth as readers and writers within the context of each program area. In the words of the student services coordinator: “People see the need, but they don’t yet have the strategies.”

There were suggested pre-requisites for all program areas listed in the 2006–07 courses of study. The director explained that these are to help students to understand that “this is what you need to know to succeed.” UTC worked with local community colleges to get some course credits for some of their certification courses, and students can be dual enrolled in some cases. There is no doubt expectations were high—and getting higher. Three instructors described, without prompting, how they planned to “up” their expectations next year—in one class, students will be expected to read more; in another, they will be expected to do more presentations; in a third, they will be expected to design to a higher level of criteria.

Supports for Struggling Students

There were special education students in all programs. The student services coordinator monitored all IEP’s of special education students from sending schools and assisted teachers to know the needs of the students. According to the director and the coordinator, there were successful special education students in all programs. The NWEA MAP test results provided information to help staff determine where additional literacy and math support was needed.

During the 2005–06 school year there was a pilot Literacy Volunteers of America (LVA) program. Three students, all in the welding program, met once per week with an LVA tutor during class time. It is planned that the program will expand to ten students sometime in the fall of 2006. Training for volunteers included information about adult learning theory, learning disabilities, strategies, resources, and the reading process, as well as an overview of materials and how to set up and plan the tutoring sessions.

Academic Resource Center

About 90 of the school’s 500 students use the Academic Resource Center, designed for credit recovery or to help students who missed essential credits at their own school. The center ran like an independent study lab with support. There were reading and writing assignments and templates on the computer. Students scheduled time out of their shops to work on these other courses; if they completed the work, they received the credit.

Use of Data

Last fall, UTC gave the NWEA reading survey test for the first time to all of its students and teachers received their students' lexile scores. Next fall all of the math, reading, and language use subtests will be given at the beginning and end of the year.

Next Steps

- Establish clear expectations for the amount, scoring, and use of scaffolding strategies for reading, writing, vocabulary development, and presenting in all program areas.
- Provide professional development for all staff to expand teachers' understandings about literacy and showcase additional strategies they can use.
- Continue having outside consultants come in and work with the staff on a regular basis.
- Continue to build the literacy expertise of on-site staff and find ways to make them available as resources to teachers.
- Use data to inform instruction and to monitor progress.
- As the NWEA is put in place in the spring and fall
 - ▶ Distribute the information to the teachers.
 - ▶ Provide training to teachers on the NWEA, lexile scores, and use of data.
 - ▶ Establish a plan for discussing students' reading levels with them and "creating the need" for them to improve their reading.
- Ensure there is at least one set of trade journals available in each program area.
- Share literacy strategies at every Wednesday faculty meeting during the 2006–07 school year.
- Establish a professional library on-site for teachers to use.
- Establish common reading and writing components across programs to be included in career portfolios.

For more information, contact Greg Miller, Director, or Sandy Gemmel, Student Services Coordinator.

Promising Practice in Action: *Literacy Integration Across the Curriculum*

Mid-Coast School of Technology (MCST)²⁷
Vocational Region 8
Rockland, ME
Tim Hathorne, Director

- **Location:** Independent building on the seacoast
 - **Student population:** 300 students on-site; another 150 are served off site
 - **Sending schools/districts:** 7 (3 are island districts)
- ▶ **Program focus:** Literacy integration across the curriculum

Under the leadership of director Tim Hathorne, MCST has been working on integrating literacy development into all CTE program areas for several years. Literacy, at MCST, is defined as “reading, writing, math, and critical thinking.” The benefits are clear. “Quite simply,” says Hathorne, “students are doing higher quality work.”

Getting Started

The path to a program that fully integrated literacy into all CTE program areas did not happen overnight—nor was it straightforward.

Some milestones of the process:

- 1999–00 The School-Based Learning Team (SBLT) at MCST was established and met monthly. During the first two years there was a focus on instructional planning and design and portfolio development.
- 2001–02 An all-school portfolio requirement was implemented by vote of the faculty. Assessment tools (rubrics, checklists), a mission statement, vision statement, and code of conduct were also developed that year.
- 2002–03 Jean Lawrence (SBLT chair) was hired as Staff Development Coordinator and the SBLT began to look at the lack of math and reading skills some students brought to MCST. Monthly meetings continued with up to 85% of the staff voluntarily attending. There were also twice monthly staff development workshops and faculty meetings once per month. Staff met frequently—this was a big shift. The SBLT “recognized a literacy problem and decided to study it” by reading a variety of texts together. Based on this study, a common definition of literacy was adopted (Meltzer, 2001, p. 6). The team also decided that baseline testing should be done using the WRAT to assess students’ skill levels in math, reading, and spelling, and that trade magazines should be ordered for all programs.
- 2003–04 The SBLT lexiled all texts and recommended the use of Bloom’s Taxonomy in the classrooms. Jean Lawrence and Tim Hathorne worked with literacy consultant, Dr. Candice Bray, to get input on specific literacy strategies that teachers could use and direction for how to continue to deepen the literacy improvement focus.
- 2004–05 MCST was selected to be part of the Model Schools Program. The school implemented the Scholastic Reading Inventory (SRI) at the beginning and end of the year, which provided all students with a lexile score. Teachers in each program area adapted the idea of bellwork from Dr. Harry Wong. Lawrence created and shared literacy model lessons with staff. The Lexile Framework was hung up in every classroom. Exhibitions and presentations began in the English and medical science classrooms and grew to several other program areas. Lawrence conducted a

²⁷ This mini case study is based on information gathered from multiple conversations with MCST staff, document review, review of student work, and data collected during a site visit in April 2006.

Literacy in the Content Areas workshop for BRVC educators in February 2005. Lawrence and Hathorne played a leadership role for academic instructors at CTE centers in the state Maine Association of Vocational Education Administrators (MAVEA) organization.

2005–06 Literacy assessment in reading and math was increased to fall, mid-year, and end of year. Re-emphasis of the literacy focus, the focus on the use of Bloom’s Taxonomy, and the teachings of Harry Wong’s *Effective Teacher* series occurred. Twenty-five common strategies the faculty had researched and been using were put together into a booklet in March 2006 and “refresher” training on the strategies was done to promote renewed emphasis. Teachers were asked to reflect on SRI results mid-year and to continue or alter the use of strategies based on the results of student performance compared with scores at the beginning of the year. Teacher professional development and support from the professional development coordinator was ongoing.

Components of Literacy Integration

At MCST, a strong set of 12 common practices was embedded within all program areas:

1. Common set of literacy support strategies—25 common reading comprehension and vocabulary development strategies have been identified and are known and used by teachers and students. This includes Word Walls in every classroom. Many of the strategies include an emphasis on critical thinking and use of the upper levels of Bloom’s Taxonomy.
2. All work projects have a writing component.
3. Career portfolios completed in every program area have common required written elements— personal essay, resume, letter of application, list of references, written reflections on work completed.
4. Career portfolios completed in every program area have common required reading elements, for example, a career explorations section for articles that the student read that contributed to career selection and planning.
5. Scaffolding of writing assignments—special education and students with weak reading and writing skills use worksheets that guide reflective reading and writing from which more independent writing can be developed. Many assignments are “chunked.”
6. Bellwork—instructors use the first few minutes of classroom time to have students focus on a reading, writing, or math assignment related to the topic at hand.
7. Focus on vocabulary—vocabulary discussions, use of Word Walls, and expectations that students use technical vocabulary in the shops and the classroom all assist vocabulary development in each program area and support content-area reading comprehension.
8. Article responses—all areas have trade magazines and use articles from the Internet for students to respond to and make connections with. Instructors develop short guided reading assignments for various articles that everyone in the class reads, or students choose articles to respond to and discuss/present to the class.
9. Presentations—students in most program areas are expected to do presentations and demonstrations. This occurs informally as students present articles they have read to their peers using a specific protocol. More formal presentations and demonstrations are scored using rubrics and the feedback is provided to the students. For example, four-point rubric provided to students in the Tech I and II classes included the following categories: *organization, content knowledge, visuals, and preparation.*
10. Common use of rubrics—common rubrics have helped both instructors and students focus on clarifying expectations and recognizing levels of quality. They are used to evaluate common portfolio elements and support school-wide development of student habits of reflection and metacognition (“thinking about your thinking”—a critical habit for a quality worker, reader, or writer).

11. Lexiling of all texts—MCST has lexiled all texts and is developing an online library of lexiled articles so they can match students with texts at their lexile level and/or know when scaffolding or use of strategies will be needed to help students understand what they read.
12. Reading assessment three times per year—recognizing that just knowing where students begin or end is not enough, MCST has instituted a mid-year assessment to allow instructors to respond appropriately to growth patterns through continued support or changes in instruction.

What It Looks Like in Action

At MCST there were bookmarks with the school's logo and motto: "Education through **applied learning**—where academic literacy finds meaning." For MCST, the definition of literacy included reading, writing, and math literacy. To know what was talked about, one only had to visit the maze of classrooms and shops that make up MCST. Students were *busy* at MCST—creating, fixing, designing, reading, writing, discussing, problem solving—amidst the whirl of machinery and the echoes of hammering. Most were quite articulate when asked to describe what they were working on. There was a clear belief in the importance of student choice—students work on different projects or project components, read various articles, research different topics—depending on interest and, perhaps as a result, student engagement was high. Words and expectations for high quality work in the classroom and in the shop were everywhere.

- In the carpentry classroom, the words on the white board included: *miter joints, tenons, tang, oilstones*. There was a reading assignment in the NCCER textbook—Section 3, p, 52–53. Students recently completed a research project to develop and price out a tool list. The bellwork assignment was portfolio related.
- In the precision machinery classroom, the word wall included: *traverse, rate of feed, arbor cutters, shank cutters, facing cutters, side cutters*. Students self-assessed their work against criteria and added to their portfolios. Required portfolio contents and some math problems were on the board. The instructor said: "No matter what they do in here, it's all math-based." Every week or two he has students: 1) pick an article (copies of trade journals were scattered around on the tables and the shelves); 2) identify their own key words and answer questions; and 3) figure out the procedure or actually make the part or describe how it is done. "Once they get started, they love the magazines and are always looking at them." A glance at the portfolio requirements revealed that for each project, students were to include a procedure sheet, a blueprint, sketch or drawing, a photo and comparison sheet, a photo with a written description, a work sample summary, and a project feedback form.
- In the auto collision classroom, the words on the word wall included: *isocyanates, viscometer, Zahn cup, mill thickness*. The instructor explained about a three-part project that students completed that quarter in which they 1) selected an article which was connected to what they were working on and current; 2) filled out a reading guide as they read the article; and 3) presented an oral presentation to the other students about the article. The goal was to stress the importance of "reading the literature so they keep current." Students received a packet with a planning worksheet, a speaker's checklist, a self-evaluation sheet, and a rubric for the oral article presentation. Presentations were evaluated using a rubric which showed how well they met the criteria. "It worked well, it really, really did. I would do it again. I wasn't too sure about it but they did a great job."

What Teachers Said

"Kids in this class have to do a lot of reading—they have to know how to get it, where to find it, and how to apply it. I make them read before we even start doing a project...They don't give me much trouble about the reading. Just keep it in the content area and you're fine."

“Students have to be able to read the tables and the diagrams, know how to interpret the information and where to find the relevant information.”

“I don’t accept ‘do you have a thingy?’—I don’t even acknowledge that... Make-up work is always reading. They choose. I say “make it something that will excite me,” not the latest model of Yamaha, but something about a diesel motorcycle. I ask them to read and highlight the information that is interesting and going to make it different. Then I check what they highlight.”

What Students Said

Students seem mostly unfazed by the reading, writing, and math focus at MCST. One student said: “There’s a lot more reading and writing and math. I knew math was involved but I didn’t know it would be that extreme.” The following quotes are from students who were in classes during the April 28, 2006 site visit.

About reading at MCST:

“The reading here is much more beneficial than reading Shakespeare. It’s interesting. I can understand it.” ... “It’s very straightforward, tells you the facts. It’s written in ‘English’ and I’m just more interested in it.” ... “Here I read and it’s about construction. At the high school it’s like literature and stuff. I like reading here better than at the high school. I don’t really like to read. You need to pay attention to everything but [in the reading we do here] there are pictures and diagrams.”

About writing at MCST:

“Writing is different here because we actually use it. I used my portfolio to get a job. I just started there. They do the same stuff we do here. I know exactly what they’re talking about.”

About achievement:

“I do better academically here than at the high school—by far.”... “Coming here got me out of trouble, it really did.” ... “Wish I’d come here sooner.”

Academic Classes

MCST offers technical English classes for credit, utilizing a range of literacy support strategies and the PLATO system to provide instruction. The literature anthologies contain pieces related to work and career settings, and ethical dilemmas and the projects are connected to the student’s CTE program area. Research skills, presentation skills, close reading, writing, and other academic literacy skills are the focus of the curriculum. Math classes are also taught at MCST for students who cannot take them at their sending high school.

Use of Data

“Data-driven decision-making is key” says Hathorne. MCST tests all students using the SRI to get a lexile score for each student. Teachers have taken the test themselves and they talked to the students about the importance of the test so they won’t “blow it off.” Students were retested at mid-year and again at the end of the year to track growth in reading. Teachers were asked at mid-year to look at how many of their students have grown as readers since the beginning of the year and what types of instruction they think contributed to this growth. Then they were asked to look at the students making little or no progress and to determine how instruction should change to better support the growth of these students as readers. MCST provides close and personal accountability and parallels the types of self-assessing programs students are asked to do. MCST also used the WRAT math test to track student progress.

Improving Academic Rigor

The reading, writing, presenting, and self-assessing demanded in all program areas increases the rigor of whatever is being taught. Every program has the Maine Learning Results (MLRs)

that are integrated into it posted as part of the course description. For example, there was a scope and sequence overview of the teaching plan by quarter for program competencies that outlines the learning tasks, MLRs taught and assessed, and the types of reading and math activities that support the instruction of each area. When students do a work sample for their portfolio, they are required to list the relevant MLRs they have addressed during the project.

Additional Supports in Place

There were on-site technical English classes, an integrated Medical Science/English program where students received credit for both subjects, ongoing professional development, and participation by the majority of teachers in the school-based learning community (SBLT). Both Lawrence and Hathorne placed articles in teachers' mail boxes relative to the importance of academic and literacy integration to prepare students for the 21st century workplace; emphasized the importance of data-driven decision-making; and found resources for professional development, trade magazines, assessments, and other key supports.

Evidence that It Makes a Difference

Evidence of teacher buy-in to the notion of academic and literacy integration into all program areas was readily seen on a quick tour, as was evidence of student engagement and the common literacy integration components. All scope and sequence documents included literacy supports. But is it making a difference for student achievement? Hathorne and Lawrence claimed that SRI and WRAT end-of-year trend data showed a steady increase in reading and math scores over the past three years. MCST is in the process of looking at additional ways to use the data it has collected to support individual student progress. The center wants to document and track how well it serves students across the board, and which types of learners meet with success, given program supports. Preliminary data from last year showed that the majority of students made gains as readers based on SRI data. More planning and analysis are needed for current data to serve adequately for progress monitoring.

Next Steps

Continue to:

- Develop a more comprehensive data analysis and progress monitoring system.
- Use the Successful Schools Network membership to support emphasis on literacy integration.
- Review schedules for island students and students from sending schools, and utilize technology to ensure that the academic and literacy integration is not inadvertently left out of their program of study.
- Review, on a rotational basis, the common practices, requirements, and strategies to ensure ongoing effectiveness.
- Provide teachers with professional development.
- Ensure that new teachers are introduced to, and supported to use, common practices and skills.
- Strengthen communication with the sending schools/districts and develop, where possible, more understanding of MCST offerings, goals, and expectations.

For more information, contact Tim Hathorne, Director, or Jean Lawrence, Staff Development Coordinator.

Career and Technical Education
Promising Practices Initiative

Sponsored by the Maine Department of Education,
Division of Career and Technical Education,
and the Maine Association of Career and Technical Educators

Featured Promising Practice:
***Use of an Onsite Academic/Literacy
Specialist***

Maine CTE Centers
working with this *Promising Practice*:
**Capital Area Technical Center
Northern Penobscot Technical Center, Region 3**

October 2006

Promising Practices descriptions and mini-case studies developed by
Julie Meltzer, Director of Literacy Research and Development for
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PROMISING PRACTICE: *USE OF AN ONSITE ACADEMIC/LITERACY SPECIALIST*

Description

The school has an onsite academic/literacy specialist who splits his/her time between 1) providing strategic literacy interventions and academic support to struggling learners, and 2) working with CTE teachers to provide professional development, modeling, coaching, resources, and other supports to help teachers embed literacy development within CTE classes.

Why Is This a *Promising Practice*?

Maine's CTE Centers faced two pressing needs when working to improve students' literacy skills:

1. Strengthening the weak academic and literacy skills some students bring to their work in the CTE center.
2. Helping all teachers to be able to support students' literacy development given the high literacy demands of the 21st century workplace.

Some centers have explored the possibility of using onsite support through a staff position to address both of these needs. An academic/literacy specialist provides direct services to students part of the time and support services to teachers the rest of the time. For small schools in particular, this staffing pattern, coupled with additional teacher professional development and supported with technology, can enable CTE centers to meet both needs.

Supporting Students

There is much in the literature about the importance—and the effectiveness—of providing strategic interventions to develop students' weak reading, writing, and math skills at the high school level. Such interventions must be designed to *accelerate*, not merely remediate, because students need to make up for lost time. Many successful approaches incorporate the use of technology to customize instruction, provide a motivating self-paced format for student learning, and allow teachers to track student progress and respond to student needs (Biancarosa & Snow, 2004).²⁸ The use of technology can also support greater collaboration between the CTE center and the sending school, and enable students to work on skill development and credit recovery in both settings. Providing these services at the CTE center makes sense for logistical reasons. In addition, students may be more motivated to work on their literacy skills when these are directly connected to the competencies students need in order to succeed in their CTE program area.

Supporting Teachers

There are indications, throughout the literature, of the positive impact an on-site literacy coach has in encouraging teachers to provide literacy development as a regular part of their classroom instruction (Sturtevant, 2003).²⁹ The literacy integration goal is that all instruction will be more academically rigorous and will help students develop key reading, writing, speaking, and thinking skills.

²⁸ Biancarosa, C., & Snow, C. E. (2004). Reading next—A vision for action and research in middle and high school literacy: A report to Carnegie Corporation of New York. Washington, DC: Alliance for Excellent Education. Accessed July 26, 2006 at <http://www.all4ed.org/publications/ReadingNext/ReadingNext.pdf>

²⁹ Sturtevant, E. (2003). The literacy coach: A key to improving teaching and learning in secondary schools: A report of the Alliance for Excellent Education. Accessed July 26, 2006 at <http://www.all4ed.org/publications/LiteracyCoach.pdf>

To be successful, literacy coaches must understand the literacy demands of the program areas; have a good rapport with teachers; have a clearly defined role of which everyone is aware; be supported by the director; and have adequate *time* to spend co-teaching, co-planning, modeling, and coaching teachers.³⁰ Coaches *should not* have an evaluative role.

Keys to Success

- Percent of Time
 - ▶ It is easy for a dual role such as this to have too many expectations upon it or for one half of the role to subsume the other. Define percentages of time to be spent in each. Clarify how the academic/literacy specialist will work with students (1:1, small groups, in classes) and teachers (1:1, small groups, workshop settings). Set up and publicize a regular schedule so students and teachers will know when and how they can access the academic/literacy specialist.
- Full-time Coach
 - ▶ A full-time literacy coach has time to fulfill additional academic and administrative responsibilities; a half-time coach does not. Similarly, a full-time academic/literacy specialist has time to set up and oversee an assessment system and be the liaison with all of the sending schools regarding student needs; a half-time academic/literacy specialist does not. If the roles are combined, it is important to be realistic in defining what the focus and scope of the combined role needs to be.
- On-site Coach
 - ▶ It is important that teachers develop a knowledge base about literacy strategies through participation in other professional development opportunities. A half-time literacy coach cannot provide all of the professional development that teachers need. An onsite literacy coach can deepen and help teachers apply what they learn and can facilitate the emergence of a professional learning community focused on literacy. But an onsite coach cannot and should not be expected to be the sole source of expertise, especially in cases where he or she is still learning about literacy.
- CTE Director
 - ▶ An academic/literacy specialist cannot be the one primarily responsible for the leadership of a literacy initiative. The CTE director is the one who needs to set the expectation about literacy integration and communicate the roles and responsibilities of the academic/literacy specialist to the staff. Working closely together, the academic/literacy specialist and the director can review student and teacher needs and make adjustments as needed for how the specialist's time should be used to address priorities.

What Does It Look Like in Maine?

Two CTE centers in Maine initiated this approach in their schools during the 2005–06 school year. Although both are in the early stages of implementation, a review of their efforts is useful for others who are considering this approach. The following mini-case studies describe how and why they implemented this promising practice, what occurred, and next steps for each center.

³⁰ For more information about recommended roles and responsibilities of literacy coaches, see the International Reading Association's Standards for Middle and High School Literacy Coaches at http://www.reading.org/downloads/resources/597coaching_standards.pdf

Promising Practice in Action: *Use of an Onsite Academic/Literacy Specialist*

Capital Area Technical Center³¹
Augusta, ME
Scott Phair, Director

- **Location:** As of 2006–07, will be adjacent to the new Cony High School
- **Student population:** Around 400
- **Number of sending schools/districts:** 8
 - ▶ **Program Focus:** Academic specialist supports students literacy development and assists teachers as they implement literacy strategies in all CTE program areas.

Scott Phair talked about how the teachers at CATC are very focused on students and that there is a shared commitment to supporting critical thinking and ways to improve students literacy habits. He also stressed that teachers need concrete strategies they can use and understands the benefit in establishing school-wide expectations.

Phair estimated the ratio between shop and academic time is “80% applied, 20% theory/short lecture.” He noted that the Center draws a high percentage of students who are not academically successful at their sending schools because of weak literacy skills, issues with compliance, or the mismatch between students’ learning styles and traditional high school classes. He talked about how collaborative the climate is at CATC and how teachers often see ways to provide interdisciplinary experiences. For example, the week before the site visit, the biotechnology and law enforcement programs collaborated on a crime scene project.

Martha Pelletier, one of the teachers in the school’s Learning Center, volunteered to participate in literacy professional development during the 2005–06 school year and to bring what she learned to students and teachers. Phair recognized that Pelletier’s presentations to staff and work with students was beginning to “open the discussion.” He scheduled a two-day end-of-year retreat to focus the entire staff on the importance of literacy development. He also encouraged several teachers to attend the summer institute presented by CTE literacy mentors from throughout the state.

Strategic Interventions

CATC offers credit-bearing academic courses for students with disabilities. These are highly scaffolded reading, writing, math, science, and history classes for which students receive credits from their sending high school. Teachers use multiple levels of texts and a lot of reading aloud. Students do PowerPoint presentations in science and timelines in history.

Students are offered self-paced individual courses for credit recovery or get help with their academic work through the Learning Center. One of the two learning center teachers, Martha Pelletier, participated in the Adult Education STAR training and worked this past year with three students who met the criteria of reading at a 4th to 8th grade reading level as measured by a diagnostic assessment. Pelletier met with the students once or twice per week using the reading strategies she learned through that program, which focused on fluency, vocabulary, and reading comprehension.

Some of the CTE programs had as many as 25% of identified special needs students. Many of these students attended CATC daily for the whole day—they were in the auto reconditioning or

³¹ This mini case study is based upon information gathered through conversations with CATC staff, document review, facilitation of a two-day literacy retreat with CATC staff, and data collected during an onsite visit in May 2006.

building trades classes for half of the day, and math, science, English, and history classes during the other half.

Helping Teachers Help Struggling Learners

The director supported Pelletier to attend the STAR training and other professional development around the state, including a workshop by Jean Lawrence in Region 8. Pelletier sometimes used 10 minutes to present what she had learned from different workshops during the faculty meetings held twice per month. She also facilitated a workshop on how to use the www.lexiles.com site. If teachers were interested in templates or specific strategies, Pelletier would meet with them one-on-one to provide more information.

Planning for Next Year

Several teachers, on a teacher-by-teacher basis, at CATC already integrate reading and writing expectations into their CTE program area classes. Teachers believe that with many or most of their students being reluctant or weak readers and writers, they have an obligation to work on these issues collectively. That way, all students will get the opportunity and instruction they need to develop these skills within the learning context of the CTE center.

CATC educators have just begun to make literacy a collective focus. During a two-day retreat in June, CATC teachers identified strategies they planned to use, made agreements, and strengthened their collective focus on literacy development. There were plans in place to use early release days and staff meetings during 2006–07 to continue the literacy work by sharing strategies and revisiting agreements. The goal was to make sure supports would be in place to help students meet the varying reading, writing, presenting, and thinking demands of each of the CTE program areas.

The academic/literacy specialist's time will be divided between working with students and working with teachers. This will help ensure students are getting the help they need in pull-out high support settings and within CTE program area classes.

Next Steps

- Regarding Sending Schools:
 - ▶ Receive students' reading level data and communicate it to teachers.
 - ▶ Discuss what types of literacy habits and skills would be helpful for students to bring to CATC to be successful.
 - ▶ Work to determine how those skills will be developed in 9th and 10th grade classes.
- Keep the literacy focus front and center by ensuring there is time for sharing and for solidifying agreements in the fall during early release days and faculty meetings.
- Establish an expectation that teachers use literacy strategies with 50% of their classroom instruction.
- Provide staff with additional literacy professional development. Establish a professional library onsite for teachers to reference.
- Articulate the literacy habits and skills that will be focused upon for each program area.
- Develop common portfolio reading and writing requirements across programs.
- Have the academic/literacy specialist work with teachers to determine additional strategies they can use to build students' literacy skills.

For more information, contact Scott Phair, Director, or Martha Pelletier, Academic/Literacy Specialist.

Promising Practice in Action: *Use of an Onsite Academic/Literacy Specialist*

Northern Penobscot Technical Center³²
Region 3
Lincoln, ME
Al Dickey, Director

- **Location:** Region 3's CTE center is in four physical locations throughout the region, with the main facility in Lincoln
- **Student population:** 250 (125 at Lincoln)
- **Sending schools/districts:** 5
 - ▶ **Program focus:** Use of the position of an onsite academic/literacy specialist to provide support to students and teachers.

Al Dickey faced major challenges—students who liked their CTE classes but were unmotivated academically; the reality of a changing and more demanding 21st century workplace; teachers who were unsure about how to do academic or literacy integration; and four locations in which to get it all done. Sending schools were uncertain why the CTE director was suddenly talking about literacy and academic rigor, insisting that they needed to work more closely together to support student success, and providing CTE teachers with literacy teacher professional development. Dickey responded to the challenge of changing expectations by adding a new staff position “to help move things in the right direction.”

At the beginning of the 2005–06 school year, Dickey hired Bethany Hatt to work 60% time as a team teacher in four CTE program areas: automotive, health occupations, building trades, and culinary arts. The other 40% of Hatt's time is spent supporting students through use of the PLATO learning system.

Supporting Students

Hatt set up a PLATO lab with four computers at the Lincoln CTE facility. The program is web-based so students can access it from their sending schools. Eight students came to the lab for one-half to one hour daily during the 2005–06 school year. Hatt said she was pleased with the progress students made and liked the way they could learn in a self-paced environment while she provided “just in time” instruction. She hopes to expand the program next year to serve more students.

Supporting Teachers

Hatt attended several professional development sessions offered throughout the state to increase her own knowledge about literacy. She worked on developing relationships with teachers and looked at ways that reading, writing, and math could be integrated into each of the four program areas. The teachers who worked with Hatt met monthly as a group to discuss what they were doing in the classroom and to support one another. Hatt also went into classes on a regular schedule on a once/week basis. She was able to facilitate a variety of English and math activities connected to what was being worked on in each program area. Sometimes she taught lessons, sometimes she co-taught with the instructor. Both Hatt and the teachers noted the importance of having time to plan together.

³² This mini case study is based on information gathered through multiple meetings with Region 3 CTE staff, document review, and data collected during an onsite visit in May 2006.

What Teachers Said

All of the teachers with whom Hatt worked voiced the importance of academic rigor and literacy integration. Teachers noted they were doing some work with reading, writing, math, and critical thinking prior to the 2005–06 school year, but they all described new things they did in 2005–06 because of the encouragement and the support. These teachers also said several other teachers asked about what they were doing and seemed to be trying out some of the literacy support strategies in other program areas. Finally, the participating teachers noted that they need to do academic integration and literacy development “more like once a week instead of two or three times per quarter.”

The four teachers voiced concern that they need to learn to differentiate the use of the strategies in the classroom the way they already do in the shop. Teachers voiced a frustration at the wide range of abilities students brought, especially the lack of critical thinking skills, and they said the literacy strategies are helpful. In the 2006–07 school year, the teachers want to focus on a few common strategies that will really help them support students’ skills in ways that are applicable to the CTE program areas. The teachers also want more strategies they can use.

The participating teachers said they found students much more open to “doing the reading and math” when it was in the CTE environment. “The content area is something that interests them and they’ll say ‘okay, I’ll give it a shot, let’s see’ and that’s the door opening a crack.” Teachers noted that the relationships they have with students gave them credibility. The consensus is that if the CTE teachers told the students they needed to do this, they will “go with it.” For example, in the automotive program the students did an oral presentation based on an inquiry topic of their choice. “I’ve never done an oral presentation but it actually came out quite well...you know, if you as a teacher promote the need, encourage, show some support...the kids believe in what we say. They trust us, they know we as teachers don’t like spinning their wheels.” However, teachers stressed the need to establish expectations up front with sending schools so students will know that they need to read, write, and present as part of their CTE program.

The teachers who worked with Hatt in the 2005–06 school year acknowledged the need for literacy development. They saw the need for themselves—and the students—to have a “toolbox” of strategies. Knowing how to read, write, and think—in the words of one teacher, is “what separates the shingle haulers from the ones running the job.”

Additional Staff Professional Development

Dickey encouraged staff to take advantage of the CTE mentor program and two of his teachers participated, developing applications of the literacy strategies for their program areas and increasing their capacity to develop literacy skills in the CTE classroom. All staff participated in three on-site two-hour workshops, with literacy consultant Tanya Baker, focused on literacy strategies for teaching vocabulary and scaffolding the reading process. This provided staff with concrete strategies they could begin to use.

Use of Data

Accuplacer data was used to determine which students should work with Hatt using the PLATO system. The director will investigate ways to get a lexile score for each student and to track both student and program progress.

Evidence in the Classroom

Despite the adjustment to a new schedule, beginning after the school year started, and facing technology challenges, there was evidence that students were helped directly in the PLATO lab and that instruction was more rigorous and incorporated more literacy in the four program areas where Hatt focused her efforts. Examples included:

- *Automotive*: Students received training in service writing and writing repair orders; oral presentations/demonstrations on a topic of interest; discussion of articles; measurement; and problem solving.
- *Health Occupations*: Students had repeated opportunities to do essay writing; reaction papers; chart reading; summarizing; and reading strategies (KWL).
- *Building Trades*: Students completed textbook survey; learned applications for fractions; and practiced reading strategies (Anticipation/reaction guide, word sort) and reading for information.
- *Culinary Arts*: Students focused on the following: research and inquiry; reading for information; writing; text structures (elements of a restaurant review, formal essay, menus); reading strategies (word sort).

One of the biggest shifts may be as yet invisible. The teachers who worked with Hatt said they were focused on where they needed to help students reach in terms of reading, writing, and math as it pertains to each program area. Teachers were more aware of what students needed—and lacked—in terms of their academic literacy skills. More teachers asked Hatt for assistance. At the end of the year, students began to ask Hatt if they could work with her to get extra help using the PLATO system. Hatt is researching getting more licenses for next year.

Next Steps

- Summarize plans for next year and publicize them to staff and sending schools.
- Publicly discuss the importance of academic integration and literacy development with students, parents, CTE staff, and sending schools verbally and in writing. Clarify the types of literacy skills that students will work on while at the CTE center.
- Continue supporting the current teacher team and find ways to work with additional teachers.
- Establish an expectation that teachers will be using literacy strategies or academic integration with 50% of their classroom instruction.
- Discuss the need for data on student reading and math abilities with the sending schools.
- Provide additional professional development to teachers.
- Develop a common toolkit of literacy strategies with examples that all teachers can use.
- Develop a plan for monitoring student progress and program progress.
- Investigate ways technology can assist with distance issues, both to serve students and to support teachers.
- Maintain a list of successful academic integration and literacy development activities and disseminate to staff.
- Increase the variety and amount of reading students do in each program area and suggest ways teachers can incorporate literacy strategies into reading assignments.
- Review the schedule to ensure students are not missing out on academic rigor/literacy development.

For more information, contact Al Dickey, Director, or Bethany Hatt, Academic/Literacy Specialist.