

By Nichole M. Tews

Integrated Curricula: Implementing English and Math Credit into CTE

INTEGRATING ACADEMICS INTO CAREER AND TECHNICAL EDUCATION (CTE) IS VITAL TO THE SUCCESS OF OUR STUDENTS, STATES AND NATION.



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UNDOUBTEDLY, TODAY'S YOUTH MUST BE equipped with the technical skills necessary to succeed in their trades, and now more than ever, they must also master the essential skills of communication and math within their chosen careers. Integrating academics into career and technical education (CTE) is vital to the success of our students, states and nation. Research has shown that incorporating literacy and numeracy skills within students' areas of interest dramatically increases the retention and understanding of these skills. But is it merely enough to incorporate numeracy and literacy skills into CTE? Do CTE teachers have enough knowledge of English and math competencies and state standards to adequately teach such skills?

As Cass Career Center—a shared-time center in Harrisonville, Missouri—discovered, it is the collaboration of CTE and English and math instructors that provides the opportunity for students to flourish. Yet the school has taken this concept one step further: It is now offering level-four English and math credit integrated into CTE. These integrated curriculums of English IV and Math IV are taught simultaneously within CTE, creating a rich academic and technical learning environment that not only prepares students for college and their careers, it allows students to earn credit in high-level English and math.

What is an Integrated Curriculum?

In its simplest definition, an integrated curriculum is created to operate and be taught within the confines of a CTE

class. Over time, CTE, English and math instructors at Cass Career Center collaborated and developed two senior-level courses, one for English and one for math, to be taught within each of the eight three-hour block programs the center offers.

These integrated curriculum English and math courses are specifically designed to incorporate real-world communication arts and math skills, in preparation for college and career readiness, into classes such as automotive technology, fire science and EMT, health science, welding and others. The possibilities are endless, because integrated English and math curriculums will mold to any CTE program, enhancing core academics in CTE and providing opportunities for students to earn senior-level credit.

Developing these English and math curriculums did not come easy, but the effort is worth the challenges. Cass Career Center hired two full-time certified instructors, one for English and one for math, to work with all students in the center's three-hour block programs as well as to develop, write and implement the curriculums for English IV and Math IV, as the courses became named. These two teachers spent time working with each of the CTE instructors to determine the literacy and numeracy skills vital to college and career readiness for students in each of the CTE programs.

Armed with this knowledge, they began working with the English and math departments of the sending high schools in Cass Career Center's district. Together, essential skills were written

and aligned with senior-level English and math courses at the high school, units and core concepts were developed for integrated English IV and Math IV, and finally, all were aligned to Missouri state content and process standards. Students entering into a three-hour block course at Cass Career Center are now responsible for learning the skills and concepts of three separate yet linked curriculums, taught together, preparing students for not only the demands and rigor of college, but real-world learning experiences where skills are rarely called upon in isolation of others.

Integrating Academics into CTE

As CTE teachers can attest, core academics and soft skills are embedded within CTE by nature, and students who graduate from their high schools and shared-time centers with a firm grasp of not only technical skills but numeracy and literacy skills become the most successful adults. Before the center hired the English and math instructors, CTE teachers evaluated their own curriculums, dissecting the layers for elements of communications, reading, computing, equating, and so on. A lot was found but at a lower academic level, and without certified instructors in English and math, the task of effectively developing rigorous assignments assessing essential skills in literacy and numeracy was not only daunting but lacked credibility.

The expertise and training of certified English and math instructors is the key ingredient for a shared-time center to be able to offer level-four English and math credit to its students. It is they who are responsible for giving assignments and assessing essential literacy and numeracy essential skills and concepts; it is they who develop the rubrics and align skills to state standards; and it is they who collaborate with CTE instructors to develop rigorous English and math skills within technical content and curriculum.



▲ Health science student Hillary Shklar and welding student Jacob White study academics using relevant program-specific applications at Cass Career Center.

How is Credit Earned?

Awarding credit for three different curriculums being taught within one three-hour block class may seem difficult, and at first it was. The center's director, Jim Spencer, worked with the counseling department at the district's high school to develop the system of awarding 0.25 credit for English IV and 0.25 credit for

Math IV per semester. Using this system, students earn 0.5 credit per year in English as well as math while enrolled in a three-hour block course. In these nontraditional courses, it will take students two academic years of English IV and Math IV to complete the course. Therefore, students must be enrolled in the applicable classes for two years at the center to

earn full credit for the senior-level English and math needed to graduate in many states. As English IV and Math IV are nontraditional courses in the sense that they are not taught in isolation but within a CTE curriculum, the integrated nature of English IV and Math IV curriculums requires a longer time period for students to learn the essential skills and core concepts of these senior-level classes. Reactions from all parties—from students to parents to counselors—have been varied, but as awareness increases, enthusiasm increases.

For many students, learning rigorous literacy and numeracy skills within CTE has shown them for the first time how successful they can be in an English or math class. For the first time, many students experience tremendous success in English and math, subjects they struggled with before; because they learn the subjects in the context of their areas of interest, the complexities of English skills such as writing a lab or status report or math concepts such as the Pythagorean Theorem finally make sense.

Students are forced to solve complex, real-world problems using the vital communication and analytical skills needed to be successful in college and their careers. When academic and technical material is taught simultaneously, students are challenged, and they succeed—and not only are students experiencing such successes, they are earning high-level English, math, and technical credit for their efforts.

Assignments: Assigning, Assessing, Scoring

The collaboration between English, math and CTE instructors is crucial to create assignments that are properly assigned and assessed to ensure students are learning essential skills and concepts as dictated by individual states in the respective topic areas. As Cass Career Center CTE instructors have discovered, having their own certified English and math

BY OFFERING STUDENTS MORE ROOM IN THEIR SCHEDULES AT THEIR HOME SCHOOL AND THE ABILITY TO TACKLE RIGOROUS REAL-WORLD LITERACY AND NUMERACY PROBLEMS WITHIN THEIR AREAS OF INTEREST, INTEGRATED CURRICULUMS SUCH AS ENGLISH IV AND MATH IV NOT ONLY PROVIDE TREMENDOUS OPPORTUNITIES FOR STUDENTS, THEY ALSO ALLOW FOR MORE STUDENT SUCCESS.

instructors to teach and assess rigorous literacy and numeracy skills allows CTE instructors to focus on technical content, all the while stressing the importance of their combined efforts, as it is in the real world. If someone can weld but can't communicate, how employable is that person? If someone has tremendous ideas for designing buildings or landscaping but has no spatial awareness, how employable is that person? How successful will either of these two people be in college? Indeed, as academic and CTE teachers teach their classes together, students experience remarkable success.

The institution's instructors have developed assignments and rubrics that simultaneously assess skills in English and/or math and a CTE course. For example, students in the health science class were assigned a research paper and PowerPoint presentation where students researched different cultures and religions and the impact on healthcare workers. Students completed an APA-formatted paper and presented their findings in a PowerPoint presentation to their health science instructor, Melanie Ryan, and English IV instructor, Nichole Tews. Each teacher evaluated the projects to meet state standards for their respective courses, but each student only completed one research project.

One of the criteria Ryan evaluated was Health Science Cluster Skill and Knowledge statement HLC 08.02.03: "Discuss the impact of religions and cultures on those giving and receiving health care with an understanding of past and pres-

ent events." One of the criteria Tews evaluated was Missouri's Department of Elementary and Secondary Education (DESE) Course Level Expectation for English IV, W2C: "Student composes text with an effective beginning, middle and end, logical order, effective paragraphing, and cohesive devices."

Each teacher had her own rubric assessing several criteria such as the aforementioned; therefore, students earned separate grades on the same assignment for English IV and health science. This same process is applicable for math, and just last year, Cass Career Center instructors worked on developing assignments that combine and assess technical, English and math skills in one collective project.

For example, students in automotive technology will compose business proposals where they must research the automotive businesses they would like to open; research the demographics of target clientele; propose budgets complete with income and expenses and data and chart analysis; and complete their projects with a formally written business proposal. In projects such as this, students can demonstrate high-level skills in academics and technical content, learn vital real-world skills, and earn credit in automotive technology, English IV and Math IV.

Getting Everyone on Board

One challenge shared-time centers will face is getting all sending high schools on board. In Missouri, it was the diligence of shared-time center directors, the Mis-

souri State School Board of Education, and Missouri's DESE Career Education Director who developed and allowed for this credit to occur in Missouri's *Graduation Requirement for Students in Missouri Public Schools*. As stated in the handbook, "School districts may choose to embed competencies from one subject into another class and award credit to students for both the embedded content and the other subject" (DESE, 2007, p. 9). This amendment paved the way for schools such as ours to begin offering senior-level credit in English and math.

At the local level, communication among all schools is essential. Spencer first brought together English and math teachers from sending schools to voice opinions about requirements for level-four English and math classes. Secondly, principals and counselors were brought to the center so they could see not only the expectations and rigors of the courses by evaluating curriculum and actual student work, but understand the 0.25 per semester credit system. Finally, school superintendents were brought together to give the final approval to implement and accept level-four English and math credit from a shared-time center. Because of the diligence of Cass Career Center's director, the quality of the integrated curriculums and the student results, sending schools were willing to provide this opportunity to their students.

Why This Works

Shared-time centers across the nation are facing hurdles such as budget cuts, increased graduation requirements and individual state concerns. By offering students more room in their schedules at their home schools and the ability to tackle rigorous real-world literacy and numeracy problems within their areas of interest, integrated curriculums such as English IV and Math IV not only provide tremendous opportunities for students, they also allow for more student success.

As health science senior Whitney Darnell notes, "This English class has to do with what I want to do with my future, for my future." To provide academically and technically rich learning environments in shared-time centers should be the goal of all CTE educators; when students earn credit in CTE as well as English and math and graduate equipped with the

academic and technical tools needed to succeed in postsecondary education and their careers, educators can feel proud. **I**

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