



INNOVATION ABSTRACTS

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INTEGRATING INDUSTRY CERTIFICATION INTO AN OCCUPATIONAL PROGRAM

It is quite clear these days that federal and state governments expect our nation's mix of higher education institutions to get better at fulfilling the promises and hopes heard at their commencements or in their competitive marketing appeals. Government and taxpayers expect colleges to provide a closer match-up between what they offer and what specialized, high-skill jobs are out there in the American market now and in the future. One community college's intensive program review demonstrates how a fresh look at curriculum, combined with close analysis of alignment and gap issues, can lead to the match-ups the public, especially our students expect, including:

- program certification with industry-ready skills
- knowledge and skill standards with international recognition
- student learning outcomes with useful feedback loops to curriculum
- incremental student incentives resulting in positive retention and completion rates

During the 2010 spring semester, the Computing Information Technology (CIT) Program at Northwestern Michigan College (NMC) undertook a "Program of Study" grant project to see what needed to be changed so that secondary programs, the college's own CIT Developer curriculum, and the information technology job market would be aligned effectively. The study also aimed at improving retention and completion rates by discovering and bridging gaps between incoming students' skills, developmental courses, sequenced prerequisites, and general education requirements supportive of the program.

With a small team (two IT instructors, an instructional support specialist, and a communications instructor with assessment experience), the NMC project documented findings specific to the CIT Developer Program, its curriculum, and its students. These findings included what secondary IT curriculum existed in the region (and

what skills such high school programs were teaching), entrance test scores for prospective CIT students, grades earned in CIT courses and related mathematics courses, the reading level of textbooks used in each course, and the patterns evident in how and when students selected courses. The team reached revealing conclusions about gaps and misalignments in the journey from secondary education (and programs for adults returning to education) through the two-year college program and into the job market. Very few area high schools offered college-prep programming courses, so there was not so much a problem of curriculum alignment as a gap. While many students arrived at NMC with computer experience in their academic backgrounds, it became evident that students who had taken basic programming courses at the secondary level often combined these introductory skills with their own computing activities, particularly gaming.

The result was that many of the younger entering CIT students—though enthusiastic about "learning to program" (i.e., develop games)—had unrealistic expectations of the rigor they would meet at the college level. Students often postponed courses recommended as helpful preparation for the CIT core curriculum (such as college-level algebra or developmental courses leading to it) in order to get right into programming or data management courses. The study's data showed a tight correlation between success/failure rates in both the recommended math courses and the core CIT courses. So it became obvious that when students postponed recommended or required courses, it decreased their chances of success.

These findings led directly to changes within the program—replacing the "recommended" designation with "required" courses now linked closely to success in CIT courses (such as college-level math and reading courses or their equivalent placement test scores) and designating required courses as prerequisites for key CIT courses—fine-tuning the sequence of CIT core courses to match where students were with their skill acquisition. The result was a far more integrated pathway through the program.



The level of scrutiny required of the Program of Study, therefore, drove a restructuring of the program's model schedule, including explicit, firm prerequisites, and course-by-course reappraisal of assignments and in-course testing.

Though these changes to the program's structure and requirements made good sense and held obvious promise, the Program of Study analysis identified an even larger gap—a gap of uncertainty: Were course syllabi (as content maps), the assigned exercises and course projects, and skill levels demanded of exams, and ultimately the program certificates, truly aligned with industry standards? In fact, what were the standards, who defined them, and who shared them? Was it possible that even the most scrupulous overhaul of the CIT programmer and data management curriculum might be limited by assumptions within academia or by course design based on quickly outpaced texts and instructors' own training?

Unlike licensing or certifications in nursing, engineering or automotive mechanics, IT has no state board, professional board, or federal regulators who define standards and provide assessment tools for determining that standards have been met. The most crucial gap identified in this particular program review, therefore, was found to be a gap in knowledge: Were the skills being provided by the curriculum those expected by employers in the industry? What standards other than course grades existed to verify and measure students' skills?

This gap—of potential shortfalls in necessary skills and knowledge, but most obviously in assurance that the skills are there—led to a sort of academic-and-industry epiphany. When the Program of Study lead investigator made contact with the software industry leader, Microsoft, to inquire about the skills most essential for entry-level developers, data managers, and other IT specialists, a breakthrough convergence, a shared recognition, took place. It was then that he was introduced to the newly developed Microsoft Technical Associate (MTA) certification program and recognized how well it fit the college's needs to align its CIT Developer curriculum with the industry and have clear standards. Microsoft managers and marketers of the MTA program gained a new insight as well. They realized that their product could help meet community colleges' needs to review and improve curriculum in this occupational program and meet the Perkins requirement for Technical Skill Attainment.

This industry-community college convergence has added one more innovation to the NMC CIT Program as reconstructed following the grant study—an innovation that filled the remaining assurance gap.

Because the MTA certificates are industry certificates, they are congruent with industry needs, based on the right skills and appropriate standards. And because the MTA certificates, in turn, are based on a series of examinations, administered on campus but scored by an impartial third party, the results of the exams not only provide passing students with skill-specific certificates (which can be great motivators for persistence), they provide performance data that cycle back into program improvement. Instructors can look at each round of exam scores, aggregated and then broken down by learning objectives, to shape curriculum revisions. In brief, the MTA certification process provides curriculum standards, not instructional content and delivery, which remain the province of the classroom and the college. But the results of the examinations, analyzed each time and over multiple cohorts, can provide pre-post measures to design and evaluate curriculum adjustments.

Although this example is specific to information technology education, its essentials can serve as a model for other occupational programs: undertaking a close review of the program itself; checking for alignment with existing secondary school programs; analyzing program courses, their sequence, prerequisites, and certificate standards for gaps or misalignments; and exploring industry standards and partnership opportunities.

The pay-offs have already been evident in the NMC's CIT Program and among its recent graduates.

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