

What Was Learned - Outcomes Assessment Under Criteria 2000 At WPI

William W. Durgin
Lance E. Schachterle
John F. Carney III
Worcester Polytechnic Institute
Worcester, MA 01609

Abstract - Six WPI engineering programs were evaluated under Criteria 2000 during a pilot accreditation visit in 1996. The WPI PLAN consists of degree requirements focused on the achievement of outcomes related to those of Criteria 2000. The mapping of degree requirement outcomes to the elements of the Criteria hinged on the translation of student performance metrics and their interpretation. Not surprisingly, substantial effort was necessary to ensure the identification of all elements of Criteria 2000, including the applicable Program Criteria in the academic program outcomes.

Preparation

WPI decided to be a candidate site under the Criteria 2000 by presenting its existing degree requirements and existing methods of assessing outcomes. WPI's PLAN degree requirements date back to the 1970's and are outcome oriented in the sense that all students must complete three projects (disciplinary, interdisciplinary and humanities) that stress outcomes similar to Criteria 2000, section 3. However, WPI recognized that its project system, including its peer review of completed projects, correlated with much of the language of Criteria 2000 but did not always precisely fit with the new ABET system in every aspect. For example, the institutional mission and goals statements were prepared a decade before Criteria 2000, primarily for regional accreditation, and were not well attuned to a detailed assessment by defined metrics. Departments were at various stages in interpreting how the university-wide mission statement applied to their programs. And while WPI had for specific occasions gathered data on graduate accomplishments resulting from the PLAN, the university did not have in place by department a systematic assessment of graduate success correlated with the results of WPI PLAN education.

Communication

The ABET visiting team and WPI agreed early to establish communications to ensure both fully understood the process of preparing for the visit to the maximum possible extent. Early discussions regarding format for preparation of written materials resulted in full preparation of traditional Volumes I

and II, accompanied by appendices specifically focused on outcomes assessment for each program. These appendices attempted to "repackage" much of the Volume II department - specific materials into the format anticipated for a Criteria 2000 visit. It became apparent during the visit that much of the prepared materials was unnecessary, although it would not have been possible to identify what to exclude prior to the visit. The appendices did not entirely successfully present WPI's methods of outcomes assessment to outsiders, in terms of meeting all the expectations for detailed metrics and assessment for all the outcomes WPI attempted.

Other preparations for the visit included development of a Web Site to assist members of the visiting team in mapping WPI's assessment metrics to the EC 2000. Several visitors remarked that it was useful in gaining understanding of WPI's programs. Finally, meetings of the WPI Team were used to develop the presentations and logistics needed for the visit. Scheduling for the activities during the visit was developed by both WPI and the Team Chair and revised several times during the visit.

Assessment Documentation

Assessment activities at WPI had developed over many years and are intertwined with the PLAN degree requirements. The documentation for the assessment activities is largely produced by faculty peer review of completed student projects. As such, specific documentation pertaining to the EC2000 was unavailable and translation from WPI's assessment measures was required. The differences in languages - that used by WPI and that used by ABET - proved to be a hurdle which was very difficult to overcome. Much of the time during the visit was spent resolving misunderstandings of both parties regarding the expected accomplishments relative to EC 2000.

For example, WPI relies upon the Major Qualifying Project (a nine-credit-hour project) as the instrument by which all engineering students (except in Chemical Engineering) have a capstone experience including design. However, in the absence of any faculty advisor notation on the completed project of exactly how the design expectation was completed in the specific report, it proved more difficult than expected for visitors, given time limitations, to discern the design outcomes by examining samples of completed projects.

Planning for Visits

It is not entirely clear how the requisite information can be communicated most effectively via the written materials. Clearly, the goals must include full understanding of the academic programs and careful explanation of assessment processes. The limited time available during the visit is not well spent on information transfer of the sort at the core of previous visits. The organization of materials relative to outcomes assessment must be presented to facilitate the visiting team's understanding from their perspective - EC 2000. It is probably unreasonable, and certainly not practical within the time constraints of the visit, to assume that all visiting team members will see program and assessment methodologies from the institution's perspective.

Visit Format

We found, in many instances, that it was necessary to review subjects during the visit we hoped had been effectively communicated prior to the visit. The result was that some elements of WPI's outcomes assessment processes were considered late in the visit. A much clearer understanding of the visit, especially its objectives, which campus personnel should be involved, and what issues are of central importance should be developed as early as possible. Our approach of producing all traditional materials and addenda specific to outcomes assessment was probably far too much for visitors to digest, to say nothing of the efforts expended in preparation. A more serious concern arises from the need to separate EC 2000 from traditional practices. By submitting traditional Volumes I and II, we sent the wrong message and invited a mapping of EC 2000 back to established practice.

With the benefit of hindsight, our visit would have been more effective if we had immediately begun with a discussion of our view of assessment and continuous feedback. Instead, we sought to bring the visiting team "up to speed" regarding our academic program and our educational philosophy, leaving them the task of relating these positions specifically to the Criteria 2000 attributes they were most interested in exploring. Crucial group time should go instead to discussing the specifics of how student outcomes are measured, and how these metrics are interpreted to provide continuous program improvement. In various ways, each WPI program had begun designing such procedures effectively, but we failed to appreciate that visitors would naturally see these efforts as less cohesive than we did from the inside.

New Viewpoint

The most significant outcome resulting from our pilot visit was the engagement of our faculty in the assessment of the

engineering programs. Discussion of the nature of outcomes assessment and the establishment of defensible measurements were initiated and is now an on-going activity. The visit resulted in a critical evaluation of feedback mechanisms for continuous quality improvement. Even though WPI had been thinking along the lines of outcomes assessment for two decades, the shift in thinking to outcomes assessment, metrics, and feedback required a cultural shift much larger than was anticipated. Our faculty are considering means by which we can more effectively quantify the outcomes of our mission. The visiting team certainly helped raise our consciousness in this regard with its probing questions.

Some immediate outcomes included increasing biennial peer reviews of project activity to annual reviews. In addition, the results of those reviews (which had been available on request to the project advisor) are now routinely forwarded to them. We are examining the merits of a student-driven portfolio assessment system. Two departments have undertaken curriculum reviews and all six are drafting improved mission statements with closely associated metrics.

In general, we found that the pilot visit caused faculty to look anew at our curriculum. On one hand, the application of EC 2000 validated many of the expected outcomes of the WPI PLAN while, on the other, it caused a critical evaluation of assumptions which had not been questioned for a long time.