Using an Outcome-based Approach to Assess Computing Programs

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ABSTRACT
In this poster, the author provides a pictorial demonstration of the elements associated with assessment and its relationship to the newly developed requirements by accrediting agencies in various countries. The presentation will provide insights on the meaning of accreditation and describes some of the new dynamics in worldwide accreditation. Assurance of educational quality encompasses assessment, often measured against established criteria. The poster describes forms of assessment and the difference between formal and informal assessment. It also provides definitions and examples of program mission, program goals, and program outcomes. It shows the difference between direct and indirect assessment and provides examples of embedded assessment, performance indicators, and the use of rubrics. The poster highlights the interaction of all these assessment characteristics.

Categories and Subject Descriptors
K.3.2 [**Computing Milieux**]: Computer and Information Science Education – *accreditation, computer science education*, *curriculum*, *information systems education*

General Terms
Management, Documentation, Performance, Human Factors, Standardization.

Keywords
Assessment, accreditation, computer science, computer engineering

1. INTRODUCTION
The U.S. Department of Education defines accreditation as a process by which a third party accrediting agency examines a facility's services and operations. Program accreditation assures that a program meets quality standards established by a profession. The movement to accredit institutions, colleges, and programs has generated a recent drive toward assessment. Most faculty members are not familiar with assessment or its methods and as a result, they are reluctant to engage in the process. Presentations such as this one, provide an avenue by which faculty members can engage actively in the assessment of a program, college, or university.

2. ASSESSMENT TYPES
Assessment can be formative or summative, objective or subjective, criteria- or norm-based, and formal or informal. Formative assessment implies a strategy for continuous assessment. Objective assessment consists of definitive responses to queries rather than multiple responses. Criteria-based assessment conforms to specific standards rather than accepted norms. Formal assessment is a response to quantitative and qualitative responses rather than casual accepted beliefs.

3. ASSESSING GOALS AND OUTCOMES
Before a program can establish program goals and outcomes, it should create a program or department mission, which is a general and encompassing statement that describes the program. Program goals describe the long-term achievements of the program's alumni. Program outcomes describe the attributes that all students should have by the time of graduation. The best approach to assess outcomes and even goals is through direct assessment, which is a first-hand analysis of student work. Embedded assessment is a key feature of direct assessment because it analyzes the student work such as written assignments, portfolios, or a senior design project. The quantification of program indicators using rubrics provides a useful way to measure student performance and ultimately program effectiveness. For example, the poster shows how one can assess a program outcome such as computer ethics by partitioning it into three performance indicators and then evaluate each indicator using a rubric. The amalgamation of the assessment for each indicator shows how one might assess a range of program outcomes associated with a program.

4. CONCLUSION
This poster graphically displays some of the salient features required for an effective assessment process. The display highlights the salient elements in a graphical way to serve as a guide, a roadmap, for faculty members to engage in the assessment of their computing programs.

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