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Transforming Teaching Evaluations One Department at a Time

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Abstract

The process for assessing teaching effectiveness within an engineering department has been thoroughly overhauled based on the Teaching Quality Framework (TQF) initiative from the University of Colorado Boulder. The TQF initiative, along with subsequent projects like TEval.net, aims to enhance educational practices by employing effective evaluation and assessment techniques. Departmental guidelines have been established to assist faculty in self-assessing their teaching effectiveness (self-voice), gathering and analyzing constructive feedback from student evaluations (student voice), and collaborating with colleagues to assess teaching through a multi-dimensional observational approach (peer voice). Additionally, templates are provided to compile assessment data and feedback for both formative uses, such as enhancing course delivery or curriculum revision, and summative uses, including annual faculty evaluations, as well as tenure and promotion decisions. This initiative is a work in progress, with further discussions of implementation strategies to come.

Introduction

Teaching is at its core the transfer of knowledge (i.e., information) from teacher to learner [1]. Thus, success in the engineering classroom only occurs when students learn. The effectiveness of learning depends on many things, including learner-based, teacher-based, and environment-based factors. As engineering faculty, if we want to improve learning in the engineering classroom, we must accept that effective teaching is only one part of the equation. Nevertheless, it is the part we have the most control over, and thus, we should strive to make our teaching as effective as possible. To make our teaching more effective, we must be able to accurately assess teaching effectiveness in the engineering classroom.

Most university faculty are familiar with teaching effectiveness evaluations or assessments at some level. Student opinion surveys (i.e. student satisfaction surveys, student evaluations of teaching, course surveys, or *simply* teaching evaluations) have been used for assessing teachers' effectiveness in one form or another since the 1920's. In many cases, though, modern assessment has relied far too heavily on student opinions as though it were a comprehensive assessment of teaching effectiveness and student learning [2], when in fact, there are numerous approaches to evaluate teaching more holistically. Other common strategies for teaching evaluation include peer observation (by fellow faculty members), external review (often by experienced teaching and learning professionals), and self-evaluation. In each case, modern approaches center on evidence-based evaluation practices [3], and several examples are discussed herein.

The objective of this paper is to lay out the process for transformation of teaching effectiveness evaluation in an individual engineering academic department. An assessment of the current state of teaching evaluation among faculty in the department will be presented, and the way forward to a more holistic evaluation strategy will be discussed

Brief Literature Review

The methods and practices used to evaluate effective teaching have been met with scrutiny over the last several years. Practices traditionally used to evaluate teaching effectiveness are commonly viewed as flawed with no direct impact or incentive related to improving teaching in higher education. These traditional methods rely heavily on student course evaluation methods [4]. While it has been accepted that faculty research should be evaluated with more thorough means by using a broader range of sources including research portfolios, peer reviewers, etc. [5], many still attempt to assess teaching effectiveness via this single metric. Certainly, various dimensions of teaching and sources of information should be considered [4].

In recent years, frameworks have been provided in efforts to enhance the process of achieving and documenting effective teaching. Most frameworks provided have roots in viewing teaching as a scholarship activity similar to research [6][7][8]. The Transforming Higher Education-Multidimensional Evaluation of Teaching project has a goal to improve educational practices for evaluating effective teaching [5]. This is a multi-institutional project with collaboration of several universities.

For instance, the "Teaching Quality Framework" initiative adopted at the University of Colorado Boulder conceptualizes teaching based on seven scholarly components including "goals, content, and alignment; preparation for teaching; methods and teaching practices; presentation and student interaction; student outcomes; mentorship and advising; and reflection, development, and teaching service/scholarship" [9]. To recognize scholarship in these seven areas, the framework considers three "voices" for assessing effective teaching including student, peer, and self [9]. The University of Kansas is also collaborating in the TEval initiative. The Center for Teaching Excellence at the University of Kansas has presented a "Benchmarks" approach to evaluating teaching effectiveness and excellence [10]. This approach also considers seven dimensions of teaching activities closely aligned with those discussed in the TQF initiative at the University of Colorado Boulder [10]. These initiatives have resulted in frameworks, tools, and guidance to take a more comprehensive approach to evaluation of effective teaching.

There is little literature related to approaches for evaluating teaching effectiveness specifically in engineering education. However, Villanueva et al. conducted surveys and interviews of educators in engineering programs and found that student evaluation of teaching is the most widely used method for assessing teaching effectiveness in engineering [11]. A more comprehensive, holistic approach was suggested [11].

Acknowledging the Current State

Considering these efforts to incorporate more holistic teaching evaluation strategies, the first step in the department's transformation process was to determine what teaching evaluation strategies department faculty are aware of, how much they value them, and what the frequency of use is for each available strategy. University policies provided guidance on how teachers' performance should be evaluated in the classroom and on evidence sources for faculty members' annual evaluations of their teaching responsibilities. Additional guidance was provided from the engineering Dean's Office on the types of evidence to support evaluation of teaching

performance by department heads. While similar, these two guidance documents were not found to be identical. Moreover, in both cases, the "guidance" in each policy document amounted to no more than a list of types of teaching evaluation evidence with no link to additional resources or procedures for using those strategies. Thus, it was evident that there might be significant variation in how faculty in the department made use of these sources of evidence (or did not use them at all) when evaluating their teaching. A survey to assess the usage of these sources was conducted within the department during an annual faculty retreat.

The teaching evaluation usage survey asked the following questions of departmental faculty:

1. How often do you use each of the following sources of evidence for teaching effectiveness evaluation?
    a. Peer evaluations (internal or external)
    b. Self-evaluation
    c. Classroom observation
    d. Student learning outcomes
    e. Student course surveys
    f. Faculty response to summative student course surveys
    g. Faculty response to mid-term student course surveys
    h. Scholarly research, publications & presentations related to teaching
    i. Course material examples and analysis
    j. Teaching grants and awards
    k. External communication from students and faculty regarding teaching
    l. Curriculum innovation
    m. Professional development in teaching
2. In your opinion, how effective are each of the sources listed above in evaluating teaching effectiveness?

Table 1 - Teaching Evaluation Usage Survey results for 13 sources of teaching effectiveness Evidence, sorted from highest perceived effectiveness to lowest. Highlighted sources show a gap in usage compared to effectiveness perception.

	Usage		Perception	
Source	Not Used	Used	Ineffective	Effective
Add'l External Feedback	33.33%	67.67%	16.67%	83.33%
Professional Deveopment	16.67%	83.33%	16.67%	83.33%
Faculty Peer Observation	16.67%	83.33%	16.67%	83.33%
Self Evaluation	25.00%	75.00%	16.67%	83.33%
Teaching & Learning Scholarship	50.00%	50.00%	25.00%	75.00%
T&L Center Staff Observation	58.33%	41.67%	33.33%	66.67%
Curriculum Innovation	16.67%	83.33%	33.33%	66.67%
Instructional Material Assessment	16.67%	83.33%	33.33%	66.67%
Student Course Surveys	0.00%	100.00%	33.33%	66.67%
Learning Outcomes Revision	33.33%	66.67%	33.33%	66.67%
Teaching Awards and Grants	66.67%	33.33%	41.67%	58.33%
Faculty Response to Mid-term Surveys	50.00%	50.00%	50.00%	50.00%
Faculty Response to End-course Surveys	41.67%	58.33%	50.00%	50.00%

Table 1 reveals that department faculty are aware of a wide range of teaching effectiveness evaluation strategies, with a majority of faculty using 10 out of 13 of these sources as evidence of their teaching effectiveness at least once in a five-year period. However, in many cases, a higher percentage of the faculty perceived the sources as good evaluation strategies for teaching than actually used them for that purpose. This suggests that there may be an implementation gap for several of these strategies due to a lack of guidance on how to incorporate these sources into teaching effectiveness assessment. In addition, it is encouraging to see so many of these strategies used by a majority of faculty. But without direct guidelines on how to use them from the university or college, it is likely that their implementation will vary widely from faculty member to faculty member, further demonstrating for the need of standardized procedures to use these sources of evidence appropriately.

As a follow-up to the survey, faculty engaged in an open-ended discussion of each of the sources of evidence above to determine which ones might be misunderstood, to hear positive and negative experiences, and to solidify which sources should be prioritized in a holistic teaching evaluation plan for the department. Of interest from the survey results are evaluation strategies for which faculty have high opinions of their value but low use in practice. This points to the need for guidance on how to implement those strategies. In addition, evaluation strategies that had consistently high utilization would be ideal candidates for the development of standardized templates and procedures so that any faculty member can incorporate those strategies into their teaching evaluation plan in a way that yields assessment information that matches to what is expected for course continuous improvement, accreditation documentation, and faculty performance assessment purposes.

Preparing the Future State

Based on survey results and departmental faculty feedback, the following teaching evaluation strategies were prioritized for the department's holistic teaching effectiveness pilot program.

1. Student Evaluations
2. Peer Assessment
3. Department Head Review
4. External Recognition of Outstanding Teaching
5. Professional Development Activities
6. Self-Evaluations
7. Instructional Material Assessment

These seven sources of evidence include each of the primary TQF voices of evaluation: self, student, and peer. Self-voice sources are self-evaluations and instructional material assessment. Self-evaluations include a critical review conducted by the instructor which may take the form of course-specific reflections assessing one's own successes and needs for improvement in teaching, as well as responses to student course survey and mid-term survey feedback. Instructional material assessment involves a critical look at the relevancy of and student engagement with course materials in relation to student performance. This may lead to evaluation of course objectives, assessments and content delivery strategies.

The student voice is traditionally most associated with student course surveys, of course. However, there are numerous approaches to assessing student opinions of the teaching effectiveness in a course beyond just the end-of-the-term summative surveys used in most courses. Mid-term survey strategies may be employed which grant opportunity for immediate course correction. Structured small-group instructional feedback sessions, which require trained facilitators, may yield more nuanced student feedback. Aggregated exit surveys or interviews with students near the end of their curricula permit a holistic evaluation of teaching strategies which may provide additional context not always available in a standard course survey.

Finally, the peer voice potentially provides the most diverse set of evidence sources. Classroom observation by fellow faculty members has long been used to provide an "external" perspective on teaching effectiveness. Most universities also have professional teaching and learning support staff who offer external observation opportunities, as well, which may be even more objective since the observer does not reside within the department or college. However, peer review of engineering education-related grant submissions provide insight into innovation strategies and other teaching-related efforts, as do scholarly publications and presentations. Furthermore, most teaching awards are reviewed by other faculty and therefore represent a high bar of peer-assessed excellence to which faculty can aspire. Finally, professional development activities usually involve learning about teaching innovation or credentialing around a particular teaching style, and these are often guided by other faculty members.

Ongoing Work and Conclusions

The transformation process is currently underway within the department with its goal to provide a holistic framework for assessing teaching effectiveness for all department faculty. Specifically, department faculty will be given i) a broad selection of evidence-based teaching effectiveness evaluation strategies chosen based on faculty feedback and covering all three voices, ii) procedures on how to use each of the evaluation strategies for assessing teaching effectiveness for faculty performance evaluation, accreditation, and course/curriculum improvement, and iii) templates for each type of use to lower the barrier to implementation and standardize the type of results that are generated by each form of evaluation.

Once procedures and templates for each application of the seven pilot program strategies have been developed, the next phase of the project will be to make them available for department faculty on a trial basis for one year. Faculty will be encouraged to expand their current use of teaching effectiveness evaluation by incorporating many of these sources of evidence. After a year of doing so, an additional survey will be administered to gauge the utilization of these new protocols and to learn how they may be improved or expanded. After this one-year pilot phase, the department will adopt the finalized protocols and templates into the faculty performance procedure as well as its ABET accreditation strategies. In this way, a holistic teaching effectiveness system which uses robust sources of evidence from student, peer and self-voices will become a normal part of how our department teaches its courses.

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