

## Responses to Guiding Questions for Administrators

### Workshop on Education Research Positions in STEM Disciplinary Departments

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#### Introduction:

The Center for Engineering Learning and Teaching (CELT) at the University of Washington (UW) is a successful campus-based center that has had a positive impact on improving engineering teaching and learning at the UW. It also provides a national model for transforming engineering education. CELT is a national pioneer in the effort to combine research on engineering education and the integration of research findings to improve learning in engineering classrooms. CELT is continuing its national leadership role as the lead institution in the NSF-funded Center for the Advancement of Engineering Education (CAEE), a collaboration of the University of Washington, Colorado School of Mines, Howard University, Stanford University and the University of Minnesota. Additional information can be found at <http://depts.washington.edu/celtweb/>.

The questions for the workshops are geared toward faculty positions in disciplinary departments. The Center for Engineering Learning and Teaching (CELT) structure includes only half of a faculty line for the director of the center. There is also one affiliate faculty member whose research area is in engineering education, but her line is in a disciplinary department. The other CELT staff members are professional staff (not faculty). The questions below are answered with respect to the success of CELT as a whole, and the need for resources to fund several professional staff positions. These positions provide the faculty development and core administrative functions. All research funding comes from soft money.

***(1) For what purpose(s) did departments within your university/school create these positions?***

- a – meet UW engineering student needs to learn more effectively
- b – meet UW engineering faculty needs to teach more effectively
- c – meet engineering education needs at the national level to provide an empirical basis to guide reform in the field
- d – be a national leader in this area by providing a model for outstanding scholarship and transformation in engineering education

***(2) What was your "theory of action" about how to achieve these purposes by creating educational research positions or by supporting departments that created such positions?***

We are recasting the question from “theory of action” to “enabling elements”. Enabling elements for the success of CELT are listed below.

*a - Combination of Bottom-Up/Top-Down Support*

Bottom-up support from faculty – CELT meets the needs of faculty who want to improve their teaching and proposal writing (on the education portion). Consultations with CELT a) answer questions faculty members have about how to improve their teaching and about engineering education in general, b) are kept confidential and, c) come at no financial cost to users of the service.

Top-down support from department chairs – CELT meets faculty needs to improve teaching. This helps department chairs as they provide support for faculty in their teaching mission.

Top-down support from the dean - The director of CELT (Cindy Atman) was recruited to UW to found CELT by the dean at the time (Denice Denton). The dean provided critical support and resources, some of which are listed here:

- Securing resources for CELT was made a top priority (see (b) below)
- CELT was part of the dean’s strategic plan for excellence in engineering education on campus and on the national scene
- CELT was part of the dean’s strategic plan to provide resources to support faculty and students from underrepresented populations in engineering
- CELT’s director was a member of the College “Executive Plus” Committee (made up of chairs and directors of academic centers). This gave CELT a place at the leadership table on an ongoing basis.

*b – Securing resources*

The dean made securing resources for CELT a top priority, including:

- allocation of half a faculty line for the director position
- start-up funds from the College and University
- making CELT a priority for the development team to secure an endowment and funding from corporate partners
- note: funding for research is secured via soft money grants

*c – People*

- A nationally known leader in engineering education was recruited to direct the center.
- There were already leaders on campus, many of whom had worked with the NSF-funded EXCEL coalition

*d – Promotion and Tenure Criteria*

- Excellence in scholarship on the teaching and learning of engineering was added as an eligible area for scholarship in the promotion and tenure guidelines in the College of Engineering.

***(3) What challenges have you encountered in establishing and supporting these faculty positions, both institutionally and culturally?***

- Locating an endowment has been challenging. Many people and organizations see the value in CELT, but few are willing to allocate significant resources for support.
- Not all engineering faculty see value in research on teaching and learning in engineering.
- There was initial confusion by some faculty on the differences between faculty development services provided by CELT and the services offered by the University-level Center for Instructional Development and Research (CIDR – a center that provides faculty development services to all parts of the university).
- There are not sufficient resources to expand CELT services to other populations (e.g., graduate students).
- CELT was the lead organization (Atman is PI and Director) of one of two NSF-funded Centers for Teaching and Learning in higher education. This is a \$10 million grant awarded to a collaboration of five institutions (Colorado School of Mines, Howard University, Stanford University, University of Minnesota, University of Washington – both colleges of engineering and education). This award, in combination with the award of several other grants led to a growth in faculty, staff and graduate students from 2 in 1998 to 16 in 2005. This growth rate creates challenges in training, support, budget administration, etc.
- This growth rate also creates challenges finding space for staff.

***(4) What lessons have you learned about these new positions? How have you addressed or do you plan to address the unique challenges associated with these positions?***

As a pioneer in engineering education we have learned many things as we have developed the CELT model. We are working on issues to enhance the effectiveness of our work on an ongoing basis, a few of which are identified here.

- It is important for CELT personnel to work closely with other units on campus. For example, on an ongoing basis CELT personnel work with colleagues from the Center for Instructional Development and Research, the Office of Educational and Assessment, and the College of Education.
- It is important to CELT personnel to work closely with other units in the college. For example, on an ongoing basis CELT personnel work with colleagues from diversity programs, faculty committees (e.g., ABET preparation committee), associate deans (e.g., preparing workshop for new faculty), to name a few.
- Longevity of service providers is important in that effectiveness of consultations and other targeted services (e.g. workshops, seminars, participation on committees) increases as relationships are built and strengthened, as institutional knowledge is developed, and COE needs are identified.

***(5) Do you plan any steps to increase/decrease such positions or to provide less/more support for departments that have such positions?***

The college is currently in leadership transition, with Denice Denton, the dean who helped found CELT having left the college in February, 2005. CELT is a strong, viable program in the interim period between deans – and anticipates continued support with the arrival of a new dean.