

Effective Faculty Development – More than Time in the Seat

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A common format used for faculty development is to hold workshops at national conferences or “one of” meetings. Often faculty come to the event absorb information and return home and anecdotally speaking, some hang onto what they learned many do not. This paper experimented with a new type of faculty development. The work brought young faculty from minority serving institutions into a one-time workshop then used personal follow up with the attendees. The objective was to keep the workshop materials fresh in their minds.

The development materials were selected to be useful for the workload expectation of faculty at predominately undergraduate institutions. These included, teaching, evaluating students, handling accreditation, student advising, undergraduate research experiences, student discipline and curriculum development. Often a new faculty member at a small university, like many undergraduate institutions, must do all these things from the moment they step on campus. This diverse set of expectations can be overwhelming.

The development program used evidence based best practice components. During the face-to-face workshop, participants were surveyed to identify what aspect of their work was most important to them. Some participants felt the need to learn to create new courses, others wanted to learn to write educational proposals. Once they identified their priority, they were asked to commit to follow through and deliver a product. Five of the attendees did not make a commitment to follow through. After the face-to-face, the participants who committed to delivering product were contacted several times during a 12 month period after the training.

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Problem statement

Many engineering graduates in the US matriculate from smaller predominately undergraduate universities (UG). These universities typically have a modest research program and place emphasis on undergraduate instruction. They also employ a significant number of PhD graduates from similar institutions. The faculty sizes are typically small and teaching loads can be formidable. Without proper training new faculty can struggle for years before (if ever) they develop the skills needed to manage expectations.

The typical job description of a tenure track faculty at a UG university is very broad and includes, teaching, evaluating students, handling accreditation, student advising, undergraduate research experiences and sometimes student discipline and curriculum development. Because the number of faculty at a UG university is often correspondingly small it is difficult for new faculty to find mentors and adequate training.

For example, the University of Texas at El Paso (UTEP) has a modest PhD program graduating several engineering PhDs yearly. Virtually all these graduates complete a technical dissertation and most have some experience as “instructor of record”. These graduates quickly find employment and many of them take tenure track positions at a UG university. UTEP also employs a number of non-tenure track PhD holders as instructors and/or researchers. Since state allocated tenure track positions are difficult to obtain these faculty help level the teaching and

research loads of the Tenured/Tenure Track research active faculty. As a result, UTEP has a sizable number of young inexperienced new PhD graduates who need training in teaching.

There are a number of excellent faculty development programs that focus on a limited set of job responsibilities. For example, teaching workshops, educational research workshops, and ABET accreditation workshops. These programs provide excellent in depth coverage of specific areas but expecting a new faculty member to attend all this training is unrealistic. What this project focused on is providing a holistic, cohesive approach to multiple areas of faculty development. By providing the basics in these areas, it is expected that new faculty will be able to better understand how to balance the demands of a position at a UG university and be more amenable to taking on curriculum innovations.

Background

Many faculty development programs focus on an individual faculty responsibility such as handling ABET Accreditation, Mentoring, Undergraduate Research or Effective Teaching. Research has demonstrated that faculty success is correlated to a reasonable balance between the faculty member's job expectations and their personal goals. The objective of this work was to produce a new faculty member that has a realistic vision of what the faculty role is and has the basic skills to begin developing in these areas.

Nelson and Hjalmarson [1] show positive results in their faculty development work when they spread the faculty development out over a period of 3 years. They show that faculty development is not a "point in time" event but a continuous growth that takes time to develop. Their work focused predominately on encouraging faculty to move from lecture mode to a student centered active learning approach. Their work included a criterion for faculty participation which included information about the person's desire to change.

The work reported here is similar in that participants were screened in an attempt to work with faculty who may feel overwhelmed or believe they could be performing more optimally. The work was also similar in that the PI followed up with participants over the term of the project to help participants keep the training in mind.

McKenna, Johnson, Yoder, Guerra and Pimmel [2] evaluated the efficacy of virtual faculty development. Their work also assumed that faculty development works best when it is time distributed and since travel to a meeting is prohibitive in terms of time and money they implemented a virtual format for faculty development. The development focus was on creating and maintaining communities of practice for the adoption of research based teaching practices. The work being reported here, was similar in that the PI followed up with the participants during the project.

The work by Stupnisky, Weaver-Hightower and Kartoshkina [3] studied a series of factors that contributed to new faculty success. They pointed out that a strong correlation existed between the faculty member's sense of balance between their professional and personal expectations. They pointed out that this was more pronounced in the case of female faculty.

This finding inspired the hypothesis for the work being reported. The idea is that faculty at UG universities can easily feel overwhelmed by the diversity of their jobs and this feeling destroys

job satisfaction which ultimately can lead to recalcitrant faculty. By providing support in several areas of a faculty member's job, it is expected that there will exist a higher probability for an enhanced sense of balance and accomplishment leading to job satisfaction and a desire to improve oneself.

One of the common faculty development areas for engineering faculty is in knowing about and implementing student centered educational pedagogies. One of the more famous development programs is the "National Effective Teaching Institute" [4], the goal of which is to improve teaching effectiveness, to promote the scholarship of teaching and to motivate faculty to engage in curriculum development on their campus. The work being reported used ideas in many of these workshops to help the participants better understand the role of instructor.

In Garet, Porter, Desimone, Birman, and Yoon, [5] studied empirical data to identify characteristics of "good" professional development. Their findings suggest that the development should focus on content knowledge (teach them facts), include active exercises (they learn what they do) and show connections to previous experience (connect to what they already know works). The work being reported integrated these positive features into the participant training.

Finally, from personal experience, new faculty often get caught up in academic discipline issues. The first few classes handled by new instructors is often the first time they see "funny" things on exam papers, or hear faint whispers during exams. New faculty often see this behavior as an insult and can let emotion take over causing them to overreact to the situation creating a larger problem than is justified. Berger and Berger [6] discuss some of the due process that students have come to enjoy. These issues were also discussed in the training events.

Methodology

The objectives were met by organizing and delivering a summer workshop for new, or soon to be, faculty and a series of follow up meetings/telephone calls to keep the ideas fresh in the mind of the attendees.

The training began with a multiday face to face program at UTEP. The face to face workshop was run in an active format and collected feedback and homework from the participants. The final assignment had the participants document what they intended to implement from the training over the next year.

The Content

The proposed face to face faculty development component contained the following information:

1. Levels of Learning
2. Course Design.
3. Course Management.
4. Good Teaching.
5. New Teacher Forum.
6. Mini Learning Workshop.
7. Basics of educational research:
 - a. Finding your hypothesis.

- b. Designing your experiment.
 - c. Selecting your evaluation process.
 - d. IRB and protection of subjects.
 - e. Carrying out your plans.
 - f. Homework: Identify an educational research topic.
8. Activity: Discussion of Homework. Think Pair and Share to tune hypothesis, Large Group Discussion to identify potential next steps.
9. How to engage students.
10. Basics of accreditation.
- a. Accreditation requirements contrasted with student evaluation.
 - b. The professional skills:
 - i. Defining them – Characteristics that define them.
 - ii. Evaluating them – Looking for the characteristics.
 - iii. Integrating them into “regular” classes – Giving opportunities to observe them
 - c. Activity: Small group discussion over 3.b.iii, Large group reporting.
11. Basics of advising.
- a. Academic, career, and life advice: Can you be too young?
 - b. Rules and regulations, the importance of common treatment.
 - c. Exceptions and love for the students. When to be tough.
 - d. Activity: Scholastic probation, what to do. Small group discussion, Large group report out.
12. Wrap up. Do one of the following.
- a. Individuals will identify a course they will teach within one year of the event and will:
 - i. Create a syllabus for the class,
 - ii. Identify an educational hypothesis that they can test while teaching the course,
 - iii. Outline a next step process for accomplishing the study of their hypothesis, such as:
 - 1. Literature review
 - 2. Review assessment literature
 - 3. Look for funding sources
 - b. Individuals will identify an Undergraduate research project they will supervise within the next year and will:
 - i. Indicate what prior knowledge students must have for the project,
 - ii. Identify the educational outcomes they want to achieve,
 - iii. Outline a next step process for implementing their activity that includes important details such as:
 - 1. How to recruit students,
 - 2. How to fund the work,
 - 3. How to find time to ensure students receive proper mentoring,
 - 4. Identify the expected results.

Discussion of results

Table 1 gives a subset of questions asked of the participants. Question 1 shows that the participants had a good understanding that they were expected to use information from the workshop in their daily routine. When the participants were polled throughout the following year, they were asked how many of the concepts were being used. Results showed a steep drop off of activity after the first semester. The participants employed at UTEP (the same University as the workshop leader) maintained activity, others dropped significantly.

Questions 2 and 3 indicate that the participants viewed the concept of levels of learning as a new concept and they felt an introduction to the concept would enable them to apply the ideas in their classrooms. The level of learning concept discussed is the idea of trying to assess how deeply students comprehend a subject. Bloom's taxonomy is one method of quantifying this idea.

Question 4 indicates that the participants feel confident in being able to create classroom management rules and regulations.

Questions 5, 6 and 7 indicate that the participants feel comfortable being able to describe good teaching. They also feel that they know how to use student feedback to help evaluate their skill and can find help when needed. Unfortunately, there was not a feedback question asking about how they felt BEFORE the training on good teaching styles so there is no hard evidence to indicate how the workshop impacted a change in the participants.

Questions 8, 9 and 10 show that the participants increased their knowledge and appreciation for the need for student team training. Participants also indicate they have confidence in their ability to use teams effectively.

Questions 11, 12 and 13 show that participants have a better appreciation for discussion activities in an Engineering classroom. This activity was one of the liveliest periods in the entire workshop. Participants were engaged significantly.

Questions 14, 15 and 16 demonstrated that the participants feel confident in being able to create educational research projects and most indicate a desire to write a proposal. Unfortunately during follow-up with the participants only one person reported that a proposal was actually submitted.

Recommendations

In hindsight it is not surprising, that the UTEP employees demonstrated significantly more follow through than others. Having the workshop leader at your worksite is similar to having a mentor to lean on. This speaks to the importance of having a face-to-face mentor.

If a future workshop is offered it is recommended to continue to include levels of learning since the feedback indicated it was a novel idea to most of the participants. Classroom management proved to be a minor issue and will be dropped from follow on workshops.

Results about faculty confidence knowing what constitutes good teaching is inconclusive. Although the participants felt confident, observations made by the leader listening to the dialog it

is not clear if the participants were confident at the beginning or if their confidence was bolstered by the workshop. The next event will include this subject and do a pre/post analysis.

Any future event should continue to include the concepts of team training and student discussion activities (how to design them and how to conduct them).

Finally, future work should place more emphasis on the creation of an educational research proposal. The next event will put educational research earlier in the event. Each learning event will then ask the participants to draw connections from the event to possible research topics. The last learning event in the workshop will have a group discussion about possible research questions. The workshop will conclude with individuals presenting a research hypothesis to the group. This will ensure that participants have at least one research area that they can expand on their own later.

Table 1 – Results from the workshop feedback.

Question No.		Strongly Disagree	Disagree	Agree	Strongly Agree
1	I understand the goals of this workshop and what is expected from me.	0	0	8	8
2	The levels of learning is a new concept for me.	0	4	5	7
3	I can easily imagine how to apply the concept of levels of learning to my classroom design.	0	1	12	3
4	I can quickly find information about creating syllabi, classroom management processes and other day to day teaching materials.	0	1	8	7
5	I believe I can write a paragraph describing the habits of good teaching.	0	0	6	5
6	I believe I can find help to identify problems I may have in my teaching.	0	0	8	3
7	I believe I can, with the help of student feedback, self-identify teaching strengths and weakness.	0	0	7	4
8	This session gave me new insights about teaming.	0	1	7	7
9	I have a better appreciation of the need for training students to work in teams.	0	2	5	8
10	I believe I have an ability to implement teams in my classroom.	0	0	13	2

11	I have a better understanding of how to use discussion in an engineering classroom.	0	1	9	5
12	I can see how Socratic reasoning can help enhance learning and/or retention of knowledge.	0	0	12	3
13	I feel comfortable that I could conduct a discussion in my class.	0	1	9	5
14	I believe I can indentify significant education problems.	0	0	10	5
15	I am interested in writing an education proposal.	0	3	6	6
16	I understand the similarities and differences in an educational and a research proposal.	0	1	9	4

References

- [1] J. K. Nelson and M. Hjalmarson, "Faculty Development Groups for Interactive Teaching," *age*, vol. 26, p. 1, 2015.
- [2] A. F. Mckenna, A. M. Johnson, B. Yoder, R. C. Chavela Guerra, and R. Pimmel, "Evaluating Virtual Communities of Practice for Faculty Development," Jan-2016. [Online]. Available:
<http://www.ingentaconnect.com/content/nfp/jfd/2016/00000030/00000001/art00005>.
[Accessed: 13-Jun-2016].
- [3] R. H. Stupnisky, M. B. Weaver-Hightower, and Y. Kartoshkina, "Exploring and testing the predictors of new faculty success: a mixed methods study," *Stud. High. Educ.*, vol. 40, no. 2, pp. 368–390, Feb. 2015.
- [4] R. M. Felder and R. Brent, "The National Effective Teaching Institute: Assessment of Impact and Implications for Faculty Development," *J. Eng. Educ.*, vol. 99, no. 2, pp. 121–134, Apr. 2010.
- [5] M. S. Garet, A. C. Porter, L. Desimone, B. F. Birman, and K. S. Yoon, "What Makes Professional Development Effective? Results From a National Sample of Teachers," *Am. Educ. Res. J.*, vol. 38, no. 4, pp. 915–945, Dec. 2001.
- [6] C. J. Berger and V. Berger, "Academic Discipline: A Guide to Fair Process for the University Student," *Columbia Law Rev.*, vol. 99, no. 2, pp. 289–364, 1999.