Year-Long Faculty Development Program for New Engineering Instructors: Description and Evaluation

Chris Migotsky, University of Illinois

Chris Migotsky is the Coordinator of Faculty Teaching Programs within the College of Engineering at the University of Illinois. He also has college-level academic advising duties with undergraduate students from all departments. He focuses on faculty development, curriculum change, and assessment and evaluation related to teaching and learning.

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Abstract

This evidence-based practice paper reports on a year-long faculty development program for new engineering faculty members at the University of Illinois: its structure, its rationale, and its impact. Participants in the program are new faculty of any rank, and include tenure-track and teaching-track individuals. The program has existed for more than 20 years, but it went through a major revision and restructuring several years ago when it expanded to a year-long format with weekly meetings, classroom observations of the new faculty, visits to excellent teachers, and collection and review of student feedback. In addition to a full description of the program, evaluative data are reported from the participants' end-of-year survey results and an analysis of the faculty members student ratings of instruction compared to non-program participants.

Background

Faculty development in higher education has seen great growth over the last 30 years [1]. It makes sense, why hire new faculty if you are not going to train them to be successful? Since 1998, first-year faculty members in the Grainger College of Engineering at the University of Illinois have participated in a multifaceted program designed to help them succeed in their instructional responsibilities. We call this program the "Collins Scholars" in honor of W. Leighton Collins, a former executive director of ASEE and long-time faculty member at the University of Illinois. All new faculty are invited, and encouraged by the Dean, to participate in the program. Approximately 75% do so. They are a mix of tenure-track and "specialized" faculty (teaching-focused instructors, lecturers, and teaching assistant professors), but the majority are tenure-track assistant professors.

These participants attend weekly seminars, for the entire academic year, on topics such as learning objectives, active learning, and grading. Actual topics covered in the 2018-2019 year are listed in Appendix A. An additional core part of the program is a classroom observation to receive formative feedback on their teaching. As part of the classroom observation process, instructors also gather informal early feedback from their students. The observation and early feedback results are discussed at a post-observation meeting. New faculty also observe, in small groups lead by a faculty development specialist, an excellent teacher in engineering. Details of these four components are provided below. While this is a large overall time commitment for new faculty, the program is spread over an entire year and the weekly seminars provide free lunch so the additional daily and weekly commitments are fairly minimal. Whether in the program or not, faculty need to eat lunch, right? Why not connect and learn while sampling free food.

It should be noted that all of the assessment aspects of the program are kept between the program staff and the individual instructor. They are not shared with department or college administrators. This is part of the philosophy of the Collins Scholar program centered on the Latin root of assessment, *assidere*, which means "to sit beside." As Braskamp and Ory [2] point out, this philosophy of formative assessment and collegial development is crucial for success. We consider the program and its activities as opportunities for coaching and working alongside a new faculty member in the spirit of support, not as summative evaluation. The new faculty appreciate this confidentiality and it fosters openness and trust without undue anxiety.

Weekly Topical Lunch Seminars

As seen in Appendix A, the weekly seminars cover a variety of topics, but are focused on teaching. Most new faculty come directly out of a doctoral program or post-doc and have little teaching experience. Their research skills are fairly strong and tend to be nurtured and mentored within their respective departments. Unfortunately, teaching development is a process that tends to be ignored by departments and left to the university or college. Our university has a required training program for new teaching assistants, but only an optional series of teaching-related workshops for new faculty. In engineering, our faculty do not participate at a high rate in the university teaching center sessions, so the college program is key to their success as instructors. The weekly lunch sessions also provide a relaxed atmosphere to connect with other new instructors and build a community of like-minded faculty who are struggling with similar concerns.

Observation of an Excellent Teacher

While the weekly sessions provide exposure to teaching theory, pedagogy, and research, it is always beneficial to see good teaching practices implemented in a real classroom. We recruit excellent teachers to open up their classrooms to the new instructors. Every year, we schedule visits to about 15 engineering instructors who have been identified as excellent by their students and peers. The new faculty sign up, in small groups, to visit these role models. An instructional development specialist accompanies them on the visits to help guide the observation and debrief afterward. Every semester, we also reserve time in the weekly seminar to further discuss the excellent teacher visits and highlight themes that emerge across the visits. The excellent teacher visits are then compared and contrasted with the actual observations of the new faculty.

Classroom Observation of New Instructor

Every new instructor in the program is observed at least once during the academic year. Some request a second observation. The observation process is driven by the new faculty member—they pick observation dates that are appropriate and they set the focus for the visit. Our approach is grounded in principles and practices based on the work of Buskit, Ismail and Groccia [3]. After a classroom visit date is confirmed, a pre-observation meeting is conducted with the new instructor and the two observers. We always have two observers, one from the development program and one trained volunteer. By having two observers, multiple perspectives are captured and the post-observation discussion is more robust. During the pre-observation meeting, the new instructor goes over the course syllabus, lesson plan for the day they are to be observed, and presents an overview of student feedback collected so far. They also inform the observers what aspects of their teaching they most want feedback on to help guide the actual observation. Once observed, the two observers share notes and write up a one-page summary of their observation. The instructor completes a self-reflection sheet before the post-observation meeting is conducted. At the debriefing, the conversation always begins with the instructor’s self-reflection, then observers share their thoughts and summary report. During the post-observation discussion, observers also attempt to make connections to the weekly seminars and the excellent teacher

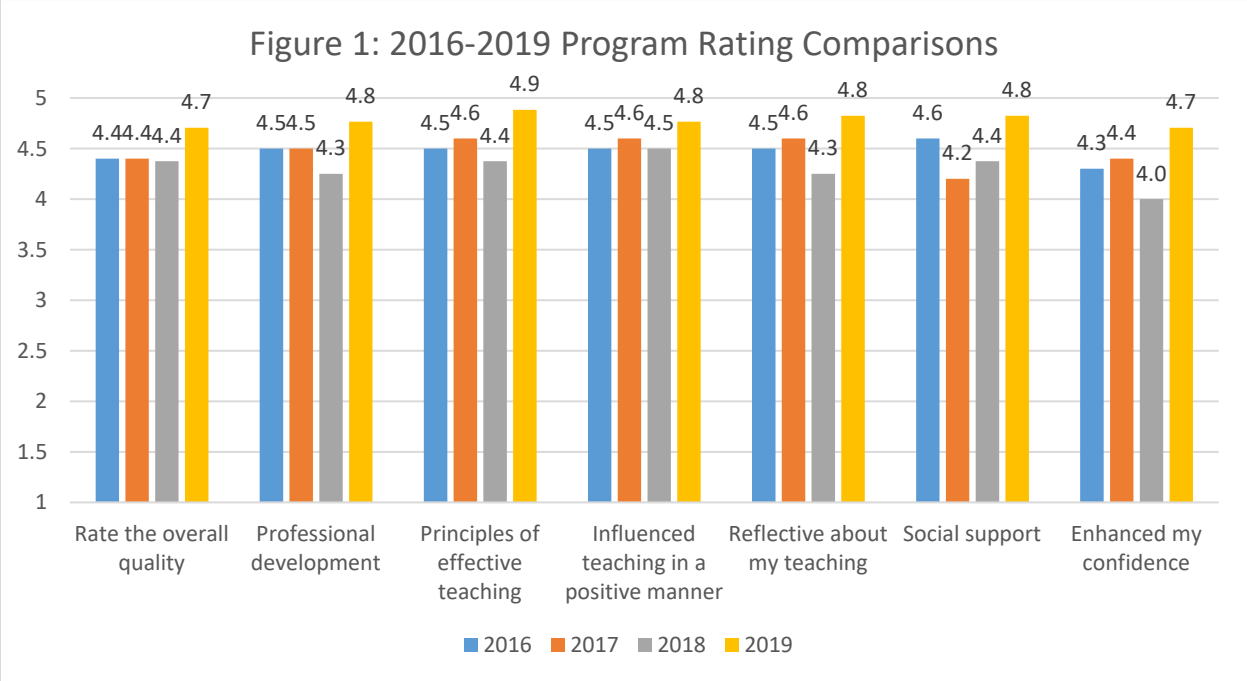
visits. The observation form and self-reflection sheet used are available in Appendix B and Appendix C respectively.

Collection of Early Student Feedback

Program participants collect informal early feedback from their students as a way to improve their instruction before the semester is over. The early feedback is reviewed with program staff during the observation process. New faculty are not provided a single form to utilize for early feedback, but the rationale and example feedback forms are covered in one of the weekly seminars. Faculty then create their own form based on their unique course and desire for specific feedback. By collecting early feedback, discussing that feedback with a consultant, and planning instructional changes, it is hoped that their end-of-term ratings will be higher [4]. The whole process reinforces the importance of a continual feedback cycle with students.

Participants' Ratings of the Program

The faculty development program lasts an entire academic year and feedback is collected during the winter break to make changes for the next semester. More comprehensive feedback is collected at the end of the program to judge effectiveness and plan for the following year's activities. The end of the year participants' ratings (Figure 1) and feedback are presented to highlight the quality of the program and features that faculty most value. The most recent 4 years of data are included. The participant feedback form is in Appendix D.



As seen in Figure 1, overall ratings are consistently high across all categories. The most recent year (2019) does show higher ratings in all categories. There were no structural changes to the program itself that year, but there was an increased involvement in the program by one extra staff member. With extra resources and feedback, it makes sense that participants rated the program higher. The last category, "Enhanced my confidence in meeting my instructional

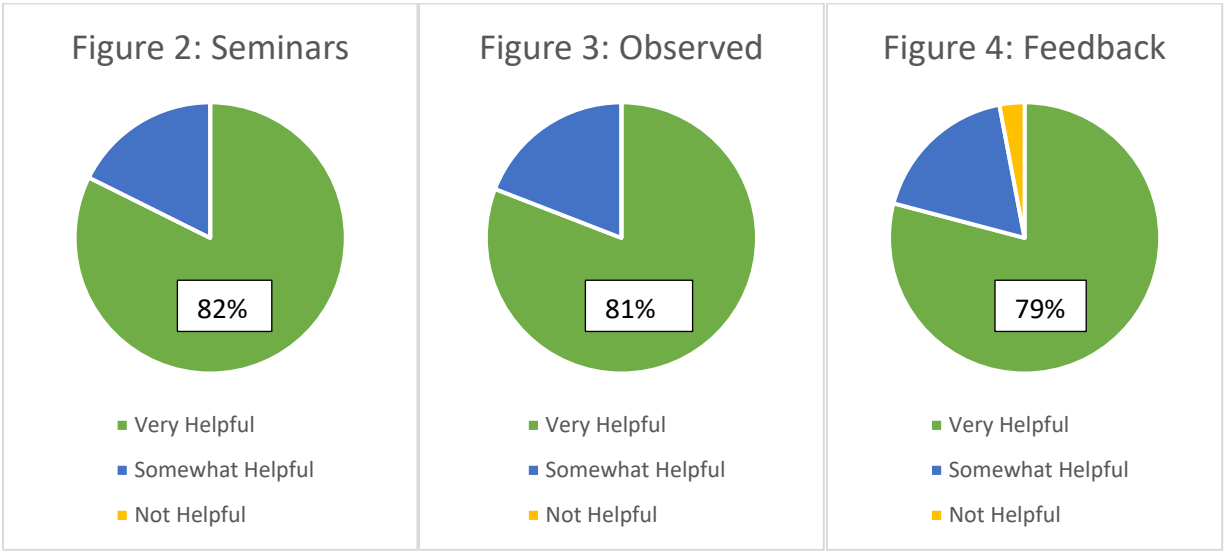
duties," tends to be slightly lower rated. Faculty often have new course assignments, thus new preparations, and lower confidence in meeting those needs going forward. With more teaching experience and feedback, that confidence likely would rise. In the future, program staff would like to supplement the survey with a faculty focus group to delve deeper into reasoning behind the ratings. It would be beneficial to also survey past graduates after they have taught for another year to get their impressions on the same outcomes list in Figure 1.

The high ratings in Figure 1 are reinforced with positive comments from the survey that emphasize the community-building aspect of the program:

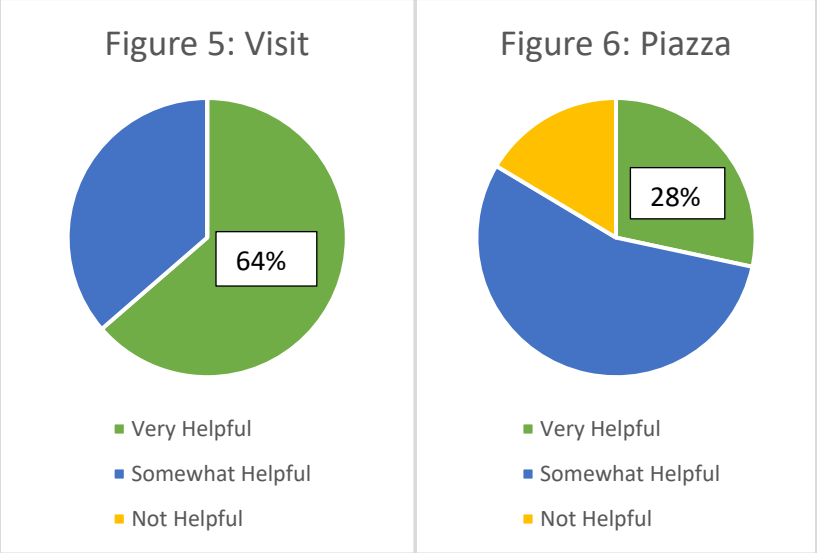
> "The opportunity to start building a network with colleagues at the same career stage was invaluable, as well as receiving feedback and interacting with more experience teachers and educators."
>
> "I think the best part is the community and connections that the program helps create. I know know 20+ other 'first timers' that I can bounce ideas and questions off of."
>
> "My favorite thing about it is the supportive environment. Starting out in a professorial job can be very stressful and you can feel isolated sometimes. Program staff do an amazing job in making things feel ok."

Continued contact over time with a community-building emphasis is as an effective strategy for engineering instructional development [5]. Our Collins Scholar program seems to deliver on this best practice.

In addition to ratings of the program, faculty also reported how helpful key components of the program were for them. This information is typically used to add or drop components in the future, or revise the implementation of a certain component that seems important but was not well received. For instance, in the past, a teaching-related book was given to all participants. The book was always rated as least helpful compared to other aspects of the program. We no longer provide a book, but instead add extra articles and book chapters to our resource list and online archive in Piazza. Here are the helpfulness ratings of five aspects of the program:



As displayed in Figures 2-4, the weekly seminars, being observed in their classroom, and collecting early student feedback are all highly rated every year. These three components are original to the program and seem integral to improvement. The lunch seminars provide knowledge, but the peer observation and student feedback are just-in-time opportunities to practice and improve. Visiting an excellent teacher and the Piazza online archive are newer components of the program and generally receive slightly lower "helpfulness" scores.



As seen above in Figure 5, there is a slight drop-off in perceived helpfulness of visiting an excellent teacher. In some cases, new faculty do not see how they can take what they observed and apply it directly to their own classrooms. The program has tried to discuss these excellent teacher visits in the weekly seminars in an attempt to further connect the role models to their teaching, but there is room for improvement. Likewise, faculty prefer to observe faculty teaching courses similar to their own. This preference is not easily accommodated, but we have added a greater variety of classes to select from: small vs. large, required vs. elective, and undergraduate vs. graduate.

The Piazza online resource continues to be rated as least helpful (Figure 6). It is primarily utilized to make announcements, archive presentation handouts, slides, and web resources. Many faculty simply do not want or need those resources. However, other faculty do use the resources and have requested to maintain access to them after the year is over. While not perfect, Piazza is easy to set-up and provides an extra way to connect faculty to teaching-related resources.

Student Ratings of Instructors

Based on the feedback from participants, the program does seem to be well received and beneficial. Would student ratings of instruction show a similar impact? Would faculty who completed the full program be higher rated by their students than those that did not finish the program? End of semester student ratings of instruction were analyzed to compare program "graduates" with those that did not start or complete the program. As with the ratings of the program itself, the last 4 years of student ratings of instruction data were analyzed. The global item "Rate the instructor's overall teaching effectiveness" was used to compare means. Only

courses where at least 5 students evaluated the instructor were included in the analysis. The sample sizes, means, and standard deviations are reported in Table 1.

Table 1			
Program Graduate	Number of Sections	Mean	Std Dev
Yes	476	4.26*	.51
No	147	4.08	.61

* significant at the .002 level

While the mean of the program participants was statistically higher than non-participants, results need to be interpreted with caution. No sub-analysis was computed for class size or required nature of the course. As student ratings literature will confirm [6], those are important variables. For this basic analysis, it is assumed that over several years and many course sections, those variables are likely to be randomly distributed between the two groups. Plus, the courses are all engineering ones, not general education type courses, so students are taking them for similar reasons (fulfill college or department requirements for graduation).

A more interesting variable might shed light on the results. The author divided the program participants into two categories (graduate vs non-graduate of the program). In reality, there are three categories: (1) full graduate, (2) participant, but not graduate, and (3) non-participant. Every year there are faculty that simply do not participate in any aspects of the program. Similarly, there are faculty that participate, but do not complete the full program (for example, attend several weekly sessions, collect student feedback, but are not observed). These partial completers are likely to gain knowledge and skills that would benefit their teaching and might affect their student ratings of instruction in a positive manner. If the analysis included three groups, I believe the differences between full program graduates and non-starters would be even more pronounced, with the partial participants falling somewhere in-between.

Conclusions

The year-long faculty development program for new engineers has been in place for over 20 years. The program has evolved over time and currently has four key components: weekly seminars, being observed, collecting student feedback, and observing an excellent teacher. All aspects of the program seem to be appreciated and highly rated. It would be valuable to add a faculty focus group with participants to delve into the reasons they are assigning different ratings to parts of the program. If possible, it would be insightful to gather information from those that did not complete the program to determine what elements we might add or subtract that would encourage greater participation.

Additionally, it appears that full participation in the program may lead to higher student ratings of instruction. More data is needed to have confidence in this assertion. An additional year or two of student ratings data, combined with three categories (graduates, participants, non-participants) would help confirm these initial findings. Similarly, if the data were sliced according to course variables like class size and required nature of the course, it would be interesting to see the resulting outcomes.

References

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[2] L. A. Braskamp and J. C. Ory, *Assessing faculty work: Enhancing individual and institutional performance.* San Francisco: Jossey-Bass, 1994.

[3] W. Buskit, E. Ismail, and J. Groccia, “A practical model for conducting helpful peer review of teaching,” in *Peer review of learning and teaching in higher education: International perspectives*, J. Sachs and M. Parsell, Eds. New York: Springer. 33 – 52, 2014.

[4] P. A. Cohen, “Effectiveness of student-rating feedback for improving college instruction: A meta-analysis of findings.” *Research in Higher Education* 13, 321–341, 1980.

[5] R. Brent and R. M. Felder, “A model for engineering faculty development.” *International Journal of Engineering Education*, 19(2), 234-240, 2003.

[6] W. E. Cashin, “Student ratings of teaching: A summary of research and literature.” *IDEA Paper No. 50.* Manhattan, KS: Kansas State University, Center for Faculty Evaluation and Development, 2011.

Appendix A: Topics of the Weekly Seminar

Fall 2018	
Aug 24	Program Kick-Off Event
Aug 31	Bloom's Taxonomy & Learning Objectives
Sept 7	Active Learning
Sept 14	Questioning Strategies
Sept 21	Assessing Students (faculty panel)
Sept 28	Student Motivation
Oct 5	Informal Early Feedback (IEF) + Engr IT (research and teaching)
Oct 12	Classroom Management
Oct 19	Academic Integrity
Oct 26	"Bring Your Questions" open discussion
Nov 2	Research Resources
Nov 9	Teaching with Tablets
Nov 16	7 Principles for Good Practice in Education
Nov 23	*Thanksgiving break!*
Nov 30	Students Needing Extra Support
Dec 7	Teaching Practices Inventory
Dec 14	*No class--Collect Feedback (online)*
Spring 2019	
Jan 18	Emotions and Learning
Jan 25	Science of Learning
Feb 1	Evaluation of Teaching
Feb 8	Grading Rubrics
Feb 15	IEF and Open Discussion
Feb 22	ABET and Learning Outcomes
Mar 1	Diversity: Equity-Minded Approaches in Action
Mar 8	Movies & Teaching
Mar 15	Review Session Jeopardy game
Mar 22	*Spring Break!*
Mar 29	Student UG Panel
Apr 5	Teaching Philosophy Statement
Apr 12	Mentoring Graduate Students
Apr 19	Celebration of Teaching & "Graduation"
April 26	Promotion & Tenure panel
May 3	Feedback and ideas for next year

Appendix B: Classroom Observation Form

Participant: *Observer:* *Date:*

Course rubric/number & location: *Approximate number of students:*

Organization
Effective introduction
Objectives stated
Preview & review
Clear transitions

Presentation
Technology/visuals
Writing on board
Voice volume & clarity
Enthusiasm
Eye contact

Interaction
Question-asking strategies
Answering student Qs
Activity design
Activity facilitation

Inclusive Teaching
Avoid stereotypes
Inclusive language
Inclusive behaviors
Use diverse examples

Content
Clarity of explanation
Use of examples
Showing relevance
Connect to previous content

Appendix C: Faculty Self-Reflection Sheet

Name: Date:

Please complete as soon as possible after your observation.

Major strengths demonstrated during the observation:

Areas for improvement:

Additional comments:

Your plan of action (completed in conjunction with observers):

Appendix D: End of Year Participant Feedback Form

Rate the overall quality of the program. (Poor—Excellent)
Participating in the program: (Strongly Disagree—Strongly Agree)

- Was valuable to my professional development.
- Enhanced my understanding of principles of effective teaching.
- Influenced my teaching in a positive manner.
- Enhanced my ability to be reflective about my teaching.
- Provided social support that made me feel valued as a teacher.
- Enhanced my confidence in meeting instructional duties.

How much did the following activities & resources help you become a better teacher?
(Not helpful—Somewhat Helpful—Very Helpful)

- Visiting excellent teacher in their classroom.
- Being observed in your classroom (with debriefing).
- Collecting informal early feedback.
- Friday lunch seminars.
- Online Piazza posts, resources, announcements.

What was the BEST aspect of the program?

What would you CHANGE to make the program even better?

What can we do next to help you continue your professional development?

Anything else you'd like to tell us about your experience with the program?