International Faculty Teaching Engineering at US Institutions: Challenges and Opportunities

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Abstract

International instructors from all over the world seek temporary or permanent teaching opportunities in engineering or engineering technology programs at United States (US) institutions. Many of them receive US graduate degrees and some have previous overseas teaching experience. This paper discusses the challenges and opportunities for instructors with international backgrounds as they teach at US institutions. The paper attempts to address issues in temporary and permanent positions including diversity, teaching, professional development, mentoring, service, and communication. The authors share their own experiences and that of a small sample of other international instructors who are teaching at US institutions. The majority of international faculty who responded to a survey were tenured, full-time professors. Professional development appears to be the leading reason attracting international faculty pursuing teaching careers in the US. The majority of those who taught in other countries used a language of instruction other than English. Most international faculty surveyed served as teaching assistants during their graduate programs but the majority did not attend teaching workshops. International faculty surveyed indicated that they do share many aspects of their international backgrounds with their students including teaching, research, and especially their culture. They listed class discussions as the primary class activity they use to address diversity in their teaching. Course design was selected to be the most challenging aspect of teaching for international faculty but other challenges identified included included communication, rapport with students, and assessment. The paper provides suggestions and advice for success new international faculty joining either visiting or tenure track positions.

Introduction

International faculty join US institutions to teach in engineering programs among other programs. The positions they pursue could be permanent as in tenure-track positions or temporary as the case in visiting positions or other forms of employment. An international faculty member pursuing a career in academia is usually faced with a decision regarding the kind of position he/she plans to take. Those who love research activities will pursue a career in institutions that also value research activities more than teaching. Others who love teaching and desire to keep it their main focus are likely to pursue a career at teaching institutions that value teaching excellence and without great emphasis on research activities and funded research projects. Some international faculty prefer non-tenure track (lecturer positions) as a career. They are usually satisfied with their choice for reasons including less stress, more flexibility but realizing the cons including lack of job security and lower salaries. The first author is a faculty member with international background who taught in both temporary and permanent settings. The second author mentored international faculty at US institutions and overseas. In the next sections, the authors will address, based on their own experiences and that from the literature, the challenges and opportunities in temporary and permanent positions for international faculty. Some of the teaching issues discussed are specific to international faculty while other issues may apply to all new faculty including internationals.
Next, the paper discusses the results of a survey that was administered to solicit opinions from international faculty who teach in engineering or engineering technology programs in the US. The questionnaire consisted of questions addressing different areas including information on the faculty current positions; their credentials and professional affiliations; their teaching and research experiences in the US and other countries; aspects of their professional and personal lives they share with students; and their teaching challenges and opportunities. Finally, advice to help new international faculty succeed is presented. Some of the points presented may also apply to other new faculty that are not international or teach disciplines other than engineering.

**Temporary Positions**

International faculty may pursue temporary positions as openings do not require prior teaching experience and hiring departments will be willing to consider candidates before completing their graduate programs and earn their graduate degrees. The temporary position gives a faculty member, who has little or no teaching experience, a golden opportunity to use all his/her time experimenting and learning how to teach and developing a teaching career without the pressure of a tenure process that requires the faculty member to find time to do research and service.

In the event an international faculty wants to pursue a permanent teaching position, they can use this time to make the necessary transition from being graduate students or teaching assistants to becoming independent professors in charge of teaching whole courses. An international faculty member may be given the option to attend department meetings and to participate in service committees. These are great opportunities to learn how things get done in a department without being heavily involved in the responsibilities. Taking advantage of provided opportunities in temporary positions can be extremely helpful to faculty members who plan to pursue tenure-track positions later. Another advantage is that the legal system makes it relatively easy to hire international faculty for temporary positions. For example, those who are finishing their graduate studies and are on student visa are given the chance to work for a couple of years before the student visa ends. Other international faculty coming directly from other countries could also join temporary positions under a temporary visiting visa that allows them to work for a limited period of time, usually one or two years.

There are a number of challenges/disadvantages in temporary positions. Perhaps the most obvious one is the fact that temporary positions are short term-employment without long-term job security or a promise of stable career. The lack of requirements for research and service in temporary positions may pose another challenge for those wishing to move to tenure-track positions. On the other hand, the limited freedom available to revise curriculum and develop new courses or electives in temporary positions could also be frustrating for ambitious temporary faculty. Voting on making decisions that will affect department policies and future may not be a privilege for a temporary faculty. The justification may be that the visiting faculty lack experience and knowledge of department history and future plans.\(^1\)

**Permanent (Tenure-Track) Positions**

An international faculty may decide to permanently settle in the US and pursue permanent employment. Reasons behind such a decision may include the opportunity of promotion and
tenure as well as professional development. The faculty member is usually given the opportunity to do research and establish a professional development program. New faculty members are encouraged to participate in service to the college and university in the form of memberships in college and university wide committees. (1)

Another opportunity available to a new faculty member joining a tenure-track position is the involvement in a mentoring program and the opportunity to grow with the help of a mentor. In effective mentoring programs, the mentor takes every opportunity to encourage, assist, cajole, and provide guidance as the new faculty begins the journey to tenure. (3) Mentoring may cover at least three areas: mentoring on effective research and scholarship, mentoring on effective teaching, and mentoring on effective time management. (4) The tenure track environment also allows the new faculty members become themselves leaders and mentors to their students. All teachers are leaders and the only choice is whether to be a good leader or to abdicate the responsibility of leadership. The teacher as mentor has enormous responsibilities that include providing information about careers or majors, providing a place for students to "experience" the professional life that is ahead of them, and to provide a model of professionalism at all times. (5)

International faculty may benefit from peer mentoring that may exist in some programs for untenured faculty to help guide them through the tenure stream. In such programs, collaboration and cooperation between the untenured faculty are emphasized leading to a genuine spirit of mutual trust and respect developing among the faculty. Another outcome of peer mentoring is creating an environment of cooperation rather than competition between the faculty. (6) One major challenge in a tenure-track position is of a time management nature. The new faculty member must perform well in teaching, research and service all at the same time. There is no slack time available and a fast start is needed

Another challenge for an international faculty pursuing tenure-track positions may involve obtaining a working visa if they are on a student or visiting visa. The process demands paper work by the program hiring and it could take a long time to complete. Some hiring programs may see the process as a hassle and may not be willing to go through the process to hire an international faculty member. The program could be concerned that the process may not come to a successful conclusion in time. Therefore, some programs may end up making it a condition in the position advertising that the applying faculty member must be a permanent resident or a US citizen, thereby excluding international faculty who do not possess such a status.

**International Faculty Teaching Opportunities and Challenges**

In primarily teaching institutions, an international faculty member must be an effective teacher in order to survive the promotion and tenure process or even get contract renewal. Traditionally, effective teaching has been linked to the long and lasting positive impact of instructors. Three distinct areas are identified as necessary for being “effective” as a professor “Character”, “Competence” and “Connection.” Character involves the personal traits of the professor. “Competence”, manifested itself in the form of the professor’s ability to convey the technical content of the material in a way easily understood by the students. The “Connection” involves a variety of personal “contact” opportunities, both inside and outside the classroom, which can occur if both the students and professor are open to them. (7)
Overall competence of the faculty has been listed as a key criterion for engineering and engineering technology programs interested in getting their academic programs accredited. The faculty must be capable of providing students an appropriate breadth of perspective and effective instruction in the use of modern technical and nontechnical methodologies in careers appropriate to the program objectives. From a student learning perspective, Lowman's research and other studies identified a "two-dimensional model" of good teaching. The first and the most important is intellectual excitement, which includes organization and clarity of presentation of up-to-date material. The second dimension identified is interpersonal rapport. This includes showing interest in students as individuals, encouraging them to think independently, and being warm, open, predictable, and student-oriented.

For international faculty to become "excellent instructors" who have significant positive impact on their students that lasts well beyond their college years, they need to possess unique qualities at both the professional and personal levels. Specific qualities of an excellent instructor as identified include effective teaching methods, enthusiasm, and instructor’s confidence in his/her knowledge. Other qualities that also characterize an excellent instructor are the way he/she treats students in class, his/her concern for student learning, grading system and fairness, his/her sense of humor, and his/her ethics and professional integrity.

A new international faculty member can learn from other teaching experiences by attending teaching workshops. One such workshop, for example, is “Engineering Engineering Education: A Catalyst for Change”. The workshop helps the faculty member gain an ability to redesign his/her courses such that students become more active, find effective ways to engage students in interacting with each other, develop a better understanding of teamwork and how it works best, and learn about new assessment tools especially assessing team performance. At another teaching workshop "ExCEEd Teaching Workshop" a faculty member can gain skills that allow him/her to improve ways of communicating with students, develop interpersonal relationships with his/her students, learn about new methods that get students to become more active in the class, and find effective ways to prepare and present class lectures. The first author attended both workshops and learned that effective teaching requires a lot of learning and effort but it is also a lot of fun.

Establishing a positive rapport with students is challenging but so important for effective teaching. New international faculty, must take the initiative to find ways to establish trust with their students beginning on the very first day of class. One example is an exercise called "Who is this professor?". The specific exercise begins when the new faculty member gives his/her students an opportunity to know something about him/her by asking him questions while working in groups. The questions could be about anything related to instructor including his/her; professional, cultural, or personal life. The instructor answers the questions he/she is comfortable with. The exercise was developed and applied by the first author who felt the exercise achieved many positive results, especially rapport with students.

Course design is one of the most challenging aspects of teaching. An international faculty member should be in a strong position to address diversity in his/her course design. The design will allow courses to better meet the educational needs of all students, including those who are diverse, with respect to diversity issues including diversity in the work place. Other reasons for
such course design include, but are not limited to, providing more comprehensive, accurate, intellectually honest views of reality; and prepare students to function in a multicultural society. ABET criteria states that programs must demonstrate that graduates have a respect for diversity and a knowledge of contemporary professional, societal and global issues. Transforming a course to be more inclusive in terms of diversity will help achieve this ABET accreditation criteria. A transformed course may increase the ability of students to work in diverse teams and in diverse environments. It should be noted that transforming technical courses in engineering, to make them more inclusive in terms of diversity, is not an easy task but can be done and is worth the try as in the case study presented by the first author.

Last but not least, the international faculty member may also face the challenge of balancing work and personal life so that success at work is not accompanied by loss in personal live. Tenure is the all-encompassing rush to the rest of one’s life; the six-year sprint to the end of the marathon. Tenure-stream professors spend an enormous amount of time "interning" in the teaching profession. The distraction of tenure is its centrality during these six years. It becomes the focus of life, perhaps an obsession for many that overwhelms some new professors.

**International Faculty Survey**

A questionnaire was administered to solicit opinions from international faculty who teach in engineering or engineering technology programs in the United States. The questionnaire consisted of fifteen questions addressing different teaching areas of an international faculty. The questionnaire was posted on the Engineering Technology Server and some international faculty were directly contacted. Only fifteen faculty members with international backgrounds responded to the survey. The small sample size poses a challenge in generalizing the survey results. Therefore, the feedback from this limited survey is not considered conclusive but rather gives general indications on the issues in questions. The authors plan to verify such results in a future study with a large sample size. The survey asked that faculty members answer the questions by placing an X on the line for all options that may apply. The first two questions asked the faculty about their teaching rank and work status. Faculty responded included eight full professors, four associate professors and three assistant professors. Eleven faculty members identified their work status as full-time, tenured. The other four faculty members are full-time, tenure-track.

Question three asked the faculty to state the reason(s) for pursuing a teaching career in the United States. Figure 1 shows that professional development is the leading reason attracting international faculty, especially those coming from countries with limited resources compared to the US. Promotion and the stability of tenure were also identified as reasons for international faculty pursuing teaching careers in the US. Other reasons included benefits and immigration. Faculty can select all that apply and that is why the percentage of maximum possible is used.

When asked if they earned US degrees, the vast majority of faculty stated that they have pursued graduate degrees, especially Ph.D., in the US before pursuing teaching careers as shown in Figure 2. None of those surveyed had a Bachelor degree from a US institution and a few never had any degrees from the US.
Figure 1: Reason(s) for pursuing a teaching career in the United States.

Figure 2: Degree(s) international faculty earn from US institutions.

Figure 3 displays the responses from international faculty with respect to their teaching experiences in years and whether such experiences were gained at US institutions or at institutions in other countries. Most faculty surveyed have significant teaching experience from US institutions and that is expected being mostly tenured faculty. But at the same time, many appear to have taught at institutions in other countries as well. Three out of five who taught in other countries used a language of instruction other than English.
Industrial experiences of international faculty surveyed appear to have an interesting pattern as shown in Figure 4. In general, international faculty surveyed have more teaching than industrial experience. Most faculty surveyed have some limited industrial experience from US companies although many of them (nine out of fifteen) are registered professional engineers. Almost all faculty surveyed indicated being members of US professional societies such as ASCE, ASME etc. Some faculty identified themselves as ABET evaluators as well.

Figure 4: Industrial experience of international faculty
In preparation for their teaching careers, most international faculty surveyed (ten out of fifteen) took advantage of the opportunity to serve as teaching assistants during their graduate programs. Some of them also attended teaching workshops during their graduate programs or during their professional careers. But still the majority did not attend any teaching workshop as indicated in Figure 5. When asked about what aspects of their international background do they share with their students, Figure 6 reveals that international faculty do share many aspects of their international backgrounds including teaching, research, and especially their culture.

Figure 5: International faculty attending teaching workshop(s)

Figure 6: International faculty sharing their backgrounds with students.
International faculty indicated class discussion as the primary class activity they use to address diversity in their teaching as seen in Figure 7. Among the many possible challenges, course design was selected to be the most challenging aspect of teaching for international faculty as shown in Figure 8. Other possible challenges identified included communication, rapport with students, and assessment.

Figure 7: International faculty addressing diversity in their teaching.

Figure 8: Aspects of teaching international faculty find challenging.
Advice for New International Faculty

- Take advantage of the opportunities available in temporary positions including experimenting with teaching methods, analyzing feedback from students, attending and participating in department meetings as well as volunteering to participate in committees.
- If in the tenure stream, establish with the help of a mentor a specific plan for improving teaching, developing research plans, and selecting appropriate service activities.
- Become efficient in teaching, as well as professional development and service.
- Continuously evaluate your teaching by self-reflection and by analyzing students’ course evaluations.
- Seek advice from your mentor and other senior faculty. Visit classrooms of other faculty and ask your mentor and other senior faculty members to attend your classes.
- Attend teaching workshops to learn from other teaching experiences.
- Achieve balance between work and personal life by setting goals and establishing priorities.
- Develop good rapport with students. Try implementing the exercise "who is this professor?" Take the initiative to find ways to establish trust with your students.
- Share with your students aspects of your international background including culture.
- Take the lead in your department in addressing diversity in your course design.

Summary and Conclusions

There are opportunities and challenges, for an international faculty member teaching engineering, in both temporary and permanent positions. Temporary positions provide opportunities for international faculty with little or no teaching experience as they can experiment and learn how to teach and develop teaching careers without the pressure of the tenure process. The legal system makes it relatively easy to hire international faculty for temporary positions. The lack of requirements for research and service in temporary positions may pose a challenge for those wishing to move to tenure-track positions. An international faculty member may pursue permanent employment for opportunities including promotion, tenure, and professional development. The international faculty member has the opportunity to grow with the help of a mentor. One major challenge in a tenure-track position is of a time management nature. The new faculty member must perform well in teaching, research and service all at the same time. Another challenge may involve obtaining a working visa if the faculty member is on a student or visiting visa. An international faculty member can learn from other teaching experiences by attending teaching workshops. Establishing a positive rapport with students is challenging but so important for effective teaching. International faculty coming from a diverse background should be in a strong position to address diversity in their course design.

A small sample of international faculty responded to a survey. The majority of international faculty who responded were tenured, full-time professors. Professional development is the leading reason attracting international faculty pursuing teaching careers in the US. The majority of faculty stated that they have pursued graduate degrees, especially Ph.D. in the US before pursuing teaching careers. Most faculty surveyed have significant teaching experience from US institutions but many appear to have taught at institutions in other countries as well. Most of those who taught in other countries used a language of instruction other than English. In general,
international faculty members have more teaching than industrial experience. Most faculty surveyed have some limited industrial experience from US companies although many of them are registered professional engineers. Almost all faculty surveyed indicated being members of US professional societies. Most international faculty surveyed served as teaching assistants during their graduate programs but the majority did not attend any teaching workshops. International faculty members do share many aspects of their international backgrounds with their students including teaching, research, and especially their culture. They listed class discussions as the primary class activity they use to address diversity in their teaching. Course design was selected to be the most challenging aspect of teaching for international faculty but other challenges identified included communication, rapport with students, and assessment.

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