Building Successful Graduates: Definitions, Admissions, Retention

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Interdisciplinary Programs at UM

- The PhD program in Applied Physics
  - 25 years old
  - graduated ~120 doctoral students
  - has ~80 students
- The Imes-Moore Fellows, a Bridge-to-PhD Program
  - 2 years old
  - has 7 students
  - fully integrated with the doctoral program
How Should a Graduate Program be Evaluated?

(1) Excellence in research

(2) Happiness of students

(3) Successful careers of our graduates
Goals

- Ph.D. level training bridging science and technology
- Preparation for careers in:
  - industry
  - entrepreneurship
  - academia
  - national labs
- Facilitate interdisciplinary collaborations
Holistic Admissions

- Our main goal is to identify students that can succeed in our program.
  - Personal statements
  - Reference letters
  - Course work and GPA
  - Prior research experience
  - GRE scores (we do not require GRE subject)
  - TOEFL and Skype interviews for international applicants

- We are willing to take risks when there is a credible story.
Our Recipe for Success

(1) Flexibility

(2) Meeting the students where they are

(3) Mentorship

(4) Family structure
Flexibility in coursework choices

- Incoming students sometimes not well prepared for beginning graduate studies. May not have covered all the courses the program expects.
  - students from varied backgrounds, including non-traditional students, returning to school after a prolonged period (in industry, armed forces personnel, family commitments, etc.) such students often need a semester or two extra time to get up to speed.
- Flexibility is needed! and (fellowship) funding needs to be available, hard to come by.
- Need to periodically review progress towards fulfilling the course requirements;
- Entry interview to identify any gaps in their undergraduate background and suggest corrective action.
- Oral Qualifying “Exam” as a diagnostic (usually one year after entry in the program). Very effective and efficient means to assess student preparation and identify gaps. Emphasize: diagnostic not “exam”
Need for effective mentoring

Early years of the graduate student experience in any program are very stressful:

- balancing difficult coursework with teaching duties
- transition from passive receptor, to active creator, of knowledge, is particularly difficult.
- demands of graduate studies must be met against the turbulent backdrop of personal relationships and family responsibilities.
- not all students are good at multitasking
- some students are unaware of their lack of preparation for graduate work until they find themselves falling behind in the first-year required courses.

.grad program must therefore be an ACTIVE PARTNER in the graduate education process
In what ways? -the Human Factors

- Build support structure in a large and sometimes uncaring bureaucracy
- Program administration and staff dedicated to well-being and SUCCESS of students. MUST BE GOOD LISTENERS!
- **conduit** for addressing problems before they get to the point of damaging student morale and effectiveness.
- Ensure each student is **plugged into some support network**, through a study group, a research group, making sure there are plenty of opportunities for the students to **get together** regularly.

- welcome receptions for incoming students,
- celebrations of achievements (academic awards, first papers published, best poster awards at conferences, etc.)
- the weekly pizza-lunch seminars
- informal receptions for faculty to meet the students.
- ......
Summary: best practices and lessons learned

- Key elements for success in a diverse graduate program include:
  - careful choice of program staff (dedicated and caring)
  - building a nurturing, supportive environment
  - identifying problems early and taking a proactive approach towards their solution
  - flexibility to allow for additional courses to fill gaps in preparation
  - adequate funding to support the first two years (subsequent years are usually supported by research grants in science and engineering)
  - early association with a study group or research group
  - continuous, ongoing mentorship of students throughout the Ph.D. dissertation process (peer mentors + faculty)