Preparing to write your educational plan for NSF CAREER proposal

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The education component is important; it should not be just what you would do anyway, such as teach classes and advise graduate students. Common ways to extend your reach include innovation in undergraduate education, outreach to high school students, continuing education, and writing a book. (Almost everyone includes a plan to develop new courses or involve undergraduates in research; you could say that too, but it won't be enough.) Routine course development or course redesign is not compelling – that is already your job. You may put your courses on the Web; this won't help much, but it can't hurt.

Read about education, research in education, and the problems of the educational system; do your homework, include citations to educational research, and address the problems noted. You are not expected to do educational research, but be aware of results in the field, where applicable

If you plan to use education data, remember IRB approvals. The UIC IRBs have responsibility for review of human subject research, and yes that includes students participating in educational research.
If working with K-12 students, get a letter from the school(s). Also, consider working with teachers rather than students.

Use the resources at the university to help with outreach. For example, WISE (Veronica Arreola) has many outreach programs for female students K-12, undergrads, and grads.

You can include costs in the budget for education component.

Educational plan

- Propose activities that you are comfortable with.
  - –If your proposal is successful you will have to do them.
- Propose realistic educational components
  - –Time required to initiate more ambitious plans may be prohibitive
- No need to reinvent the wheel
  - –Leverage existing programs on campus
- Summer camp programs identify suitable K-12 students and bring them to campus
  - –find the programs
- Someone has already isolated feeder high schools and has contact with them
  - -find that person
- Mentoring programs already exist
  - -find the programs

- Don’t forget the obvious items (…lest the reviewers find them “missing”)
  - –Web pages and courses
  - –Integration of research into existing classes (as teaching modules)
  - –Seminars and workshops
  - –Industrial visits and invite industry to campus
  - –REUs
  - –…

- Seriously writing about evaluation/assessment will make your educational part stand out

– How will you know you have accomplished your objectives? e.g., tracking students beyond their REU or course experience, distributing questionnaires to participants in presentations, etc.

- Do make sure you 'check all the boxes': diversity (women & minorities), training of graduate students, transfer of research to classroom, undergrads in research, outreach to K-12 and general public.
- As much as possible, try to check several boxes at once (e.g., recruitment of undergrads with a heavy emphasis on women or minorities)

However many "boxes" you may check, and activities you may propose, your education plan **needs to be well integrated with your research agenda – preferably with a unified theme. NSF program officers and reviewers would like to see an educational plan that is something as unique and as innovative as your original research**

Publications such as the following from the National Academy of Sciences/National Research Council (http://www.nap.edu/) may be helpful in developing the educational activities:

1. National Research Council. (2000). *How People Learn: Brain, Mind, Experience, and School*. Committee on Developments in the Science of Learning. Bransford, J.D., Brown, A.L., Cocking, R.R., Editors. https://www.nap.edu/catalog/9853/how-people-learn-brain-mind-experience-and-school-expanded-edition
with additional material from the Committee on Learning Research and Educational Practice. Donovan, M.S., Bransford, J.D., and Pellegrino, J.W., Editors.

2. National Research Council. (2001). *Adding it up: Helping children learn mathematics*. Mathematics Learning Study Committee. Kilpatrick, J., Swafford, J., and Findell, B., Editors. https://www.nap.edu/read/9822/chapter/1

3. National Research Council. (2001). *Knowing what students know: The science and design of educational assessment*. Committee on the Foundations of Assessment. Pellegrino, J., Chudowsky, N., and Glaser, R., Editors https://www.nap.edu/read/10019/chapter/1

4. National Research Council. (2002). *Scientific research in education*. Committee on Scientific Principles for Education Research. Shavelson, R.J., and Towne, L., Editors. https://www.nap.edu/read/10236/chapter/1

5. National Research Council. (2007). *Taking Science to School: Learning and Teaching Science In Grades K-8*. Duschl, R. A,.. Schweingruber, H. A, and Shouse, A. W., Editors. https://www.nap.edu/read/11625/chapter/1

James W. Pellegrino, editor and author of some of these NSF-recommended references is a Professor at UIC since 2001. He is currently a Distinguished Professor in Psychology and Education and Co-Director of the Center for the Study of Learning, Instruction and Teacher Development (otherwise known on campus as The Learning Sciences Research Institute).