

Responses to Guiding Questions for Administrators

Workshop on Education Research Positions in STEM Disciplinary Departments

From Joseph Heppert, Professor and Chair, Department of Chemistry, Kansas State University

1. What was your “theory of action” about how to achieve these purposes by creating educational research positions or by supporting departments that created such positions?

The idea of creating science education research positions within science departments was less a conscious strategy and more of a convergence of history and opportunity. Our department has had a history since the 1970s of hiring science education faculty. Granted, the two cases where such actions had been pursued were part of what I would refer to as a version 1.0 paradigm for science educators in research science departments: The expectation was that these individuals would contribute substantially to the teaching mission of the department and that writing textbooks would compose a major component of their scholarship. When I was considered for full professor, I had already been involved in educational research projects for about 5 years. Consequently, in addition to the portfolio of traditional chemistry research, I submitted a second portfolio of science education scholarship as part of my promotion and tenure packet. The science education portfolio was reviewed by external evaluators in the same manner as my science, and, though I cannot comment on how smoothly the process went through the requisite college and university level committees, I know that the promotion was approved without any questions or concerns directed back to the department. I would characterize the bulk of my science education scholarship at this level as falling within a version 2.0 paradigm for research science educators, focusing mainly the development, implementation and evaluation of inquiry-based curricula for science majors and science education majors. Since I had been successful in obtaining funding for my educational research, many of the faculty in my department were receptive to hiring additional faculty focused on educational research. This initially raised some questions about the expected role of future science education hires. Prior to proceeding with the hire, the department discussed the nature of the position, addressing concerns and misconceptions held by individual faculty, including;

- a. The fact that this individual was not being hired to coordinate a teaching program or series of courses,
- b. The expectations that this individual would establish a research program that would go beyond the Boyer definition of a ‘scholarship of teaching’, and
- c. During the promotion and tenure process, the individual’s teaching, scholarship and service contributions would be evaluated in a similar manner to other faculty in the department.

After these issues were addressed, we proceeded with the search. We hired an individual whose research focused on achieving a fundamental understanding of problem solving in chemistry and on understanding the progression of chemistry

graduate students from novice to expert status in laboratory research. I characterize these research projects as falling into a version 3.0 paradigm for science education research. While the scope and character of these projects surprised many of my colleagues, the formative discussions we had about allowing the new researcher to establish an independent scholarly focus allowed the department to support this individual and objectively evaluate the resulting educational scholarship.

2 What challenges have you encountered in establishing and supporting these faculty positions, both institutionally and culturally?

Expanding discipline-specific educational scholarship beyond our department has proven challenging for two reasons:

First, science education positions have fallen victim to competing priorities in other science departments. Both our Biology and Physics programs have established priorities for hiring science educators for the past five years; however, these positions have never risen high enough on the list of hiring priorities to ever be filled. Hiring priorities in other scientific areas have always superseded the educational research positions.

Second, the administration, which could overcome this barrier by establishing an ‘opportunity fund’ for filling science education positions has been reluctant to intervene in the departmental prioritization of faculty hiring. This reluctance stems, in part, from the administration’s belief that discipline-specific science educators hold appointments in an interfacial area, and that such interfacial appointments inherently pose greater challenges in promotion and tenure for junior faculty. Consequently, they are reluctant to push departments to fill these positions before they are ready.

3 What lessons have you learned about these new positions? How have you addressed or do you plan to address the unique challenges associated with these positions?

The following are general principles I believe apply to discipline-specific educational research positions:

- Departments and, where possible, administrative units must hold detailed discussions about the expectations for faculty hired into such positions prior to developing position descriptions and beginning the interview process.
- Expectations for scholarship and for how that scholarship relates to the research and teaching missions of the department should be well defined.
- Faculty hired into such positions must be engaged in ongoing discussions about expectations for their teaching, research and service activities: This does not mean that the key expectations should shift after these individuals are hired; rather, that communication and mentoring should be ongoing.

- It is natural for scholarly expectations to differ for discipline specific science educators among research intensive universities, smaller state universities and teaching colleges, but the nature of these expectations for a specific position must be well-articulated from the beginning of the appointment.
- Like any junior faculty appointment in today's highly multidisciplinary and collaborative research environment, a discipline-specific educational researcher is going to fit most comfortably into a science department if they naturally complement and support ongoing department research thrusts, and if they have opportunities to collaborate with colleagues in broader educational and research endeavors.
- Discipline-specific science education faculty have a better chance of success if conditions exist that allow them to develop collaborations with educational researchers in other units on campus (including science, mathematics, engineering and education units).

4 Do you plan any steps to increase/decrease such positions or to provide less/more support for departments that have such positions?

We are engaged in ongoing conversations with faculty and chairs of other departments about increasing the number of discipline-specific education researchers. Similar conversations are ongoing with members of the administration who can help to cut through many of the systemic barriers to hiring such individuals.