

Graduate Support Workshop

How to examine a policy process

The approach of James E. Anderson in Public Policy Making

1. Problem identification and agenda setting-How are problems that become the target of public policymaking are identified
Why are only certain problems chosen for attention?
Why do some problems get on the public agenda and others do not?

2. Formulation- the creation, identification or borrowing of proposed courses of action for resolving or addressing public problems.

3. Adoption - deciding whether to take action and if so, what action to take

4. Implementation - what is done to carry out the policy

5. Evaluation - determining whether a policy is achieving its goals and whether it has other, often unintended consequences.

Who has been advantaged or disadvantaged?

Are there demands to change the policy or program or terminate it?

Have new problems been identified?

Thinking about Federal policy-What is our role?

- What is the Federal role in shaping higher education? How does this contrast with the roles of state policymakers or institutional leadership?
- Why are particular policies adopted and what influences how they are then interpreted and implemented?
- What affects the eventual impact of a particular policy or a suite of related policies? Are there both intended and unintended consequences of a policy?
- How do Federal policies and funding priorities affect higher education directly as well as indirectly through influences on the competitive and regulatory environment in which postsecondary institutions operate?

Making Policy is a process of public problem solving and faces all of the challenges of any decision-making process compounded by being done in public.

I had all of this in mind as I listened yesterday and today to the discussions at this workshop. So, what is next?

We have learned a lot at this workshop about the complex interaction of Federal dollars and Federal policies with campus funding, campus strategies and policies and the personal decisions and resources of students who elect to pursue or not to pursue advanced education in STEM.

Questions:

- (1) What is the proper role of the Federal government in supporting graduate study and in encouraging and investing in explorations of innovative approaches to graduate study? What will "the market" take care of and what is so much in the national interest that

Federal agencies must act to secure appropriate attention to the people, ideas and tools needed to advance particular agendas?

As I listened to the discussion, I was struck by the fact that, although we did not really probe this question, I suspect we would not agree on what the Federal role is. A few data points may be helpful here. We learned that only 20% of full time S&E graduate students in 2001 were being supported on Federal funds, that slightly over 40% were supported by institutional funds and most of the rest were self-supporting. The patterns also differ by field with a much stronger Federal investment in the physical sciences and life sciences than in many other fields.

What do we expect from that 20%?

How should the Federal packages compare to institutional support?

Should we (a) set an example by the stipend we provide or simply match the prevailing stipend levels on campuses; (b) use our resources to shape campus policies and priorities or simply "buy" a piece of institutional capacity for national purposes? If we chose to do the latter under (b), how do we define the cost of educating a student?

At NSF, only about 12% of the graduate students we support receive their awards from the three signature programs in DGE. The rest are supported on research grants and contracts. The proportion of postdocs supported on research grants and contracts is even

heavier. We have no direct control or influence over that large number of people, what they are paid, the nature of their experience or whether or not they receive benefits or professional development support.

Our goal in our research portfolio is simply to provide the investigators with the personnel they need to accomplish the research we have agreed to support. If a PI prefers to fund postdocs or technicians instead of graduate students, that is their choice. We have talked some about whether we ought to impose any conditions or expectations on PIs who work with graduate students and postdocs, but we have shied away from doing so, not wishing to interfere with institutional policies and practices.

In our free-standing programs---IGERT, GK-12 and GRFs, we do, it turns out, interfere with institutional policies and practices. How much of that is intentional and how much of it is unintentional? It is some of each.

The designated programs—the three graduate education programs in DGE and specific postdoc programs in some of the directorates---are the only place where we set conditions, define stipends and designate an educational or institutional allowance. Since these students not only have complex financial support packages during the course of their graduate study and mingle with other students on other financial tracks, we do influence expectations about how much any graduate student should be paid and whether we should underwrite all or some of the costs

associated with their education. The conversations at this workshop will help us think more clearly about what we ought to do here and what our policy ought to be. Should we follow the NIH example and set a base (adjusted to ensure that we do not reduce the number of students we support) and then fund some percentage of posted costs above that? Should we change the label we attach to the allowance and simply call it an institutional allowance, to be used as you wish? Should we try to peg our COE to some index of tuition increase and do our best to keep pace, discounting of course since we could not afford to reach parity any time soon? We will run all of these models and more and decide what to do.

- (2) What are the appropriate policy goals for investment in graduate education? What are the agencies that support graduate and postdoctoral study trying to achieve?

The answer is very complex. Among the reasons NSF invests in graduate and postdoctoral education, both within DGE and throughout the Foundation are

- To attract more U.S. citizens and permanent residents to the study of STEM and to increase retention and successful completion of study.
- To broaden participation in STEM fields
- To attract and support "the best and brightest"
- To prepare a new generation of students who will approach their research differently and who will have had experience "crossing boundaries" and integrating their work with broader societal goals and needs.

- To encourage institutions to think differently about the education of graduate students and engage them in a broader range of applications of their scholarship.
- To attract people to government service both in management and in Federal R&D facilities.
- To create the research capacity to address national R&D priorities identified by Congress and by the White House through OSTP.
- To simply support highly meritorious research.

I may have missed a few policy goals, but this list is sufficient to make the point that each fellowship, traineeship and assistantship programs is intended to accomplish different goals and may, as a result, be designed differently. They also may have quite different unintended consequences and may depend upon different mixtures of Federal, state, institutional, individual and employer contributions and responsibilities.

- (3) What are we learning about the effects of Federal stipend levels, institutional tuition levels, and the size of the cost of education allowance or institutional allowance on
 - Campus policies and practices and how institutions support their graduate students
 - The patterns of financial support offered to students in the course of their graduate study
 - The quality of the students who wish to pursue STEM careers and which fields they wish to pursue
 - The subsequent experience of students: how long it takes to complete a degree, whether they do complete a degree, how well they are socialized into

their programs and into their fields, and how well prepared they are to pursue careers in STEM in academia, government and the private sector.

- The persistence of students, time to degree and time to good job (sometimes called time to independence).
- The decision of minority students to pursue graduate study.

Suzanne Ortega asked some good questions about these matters.

- What do we know about the graduate experience at different stages of graduate study? We need to learn a lot more about the causes of attrition and whether there are optimal financial packages for different stages.
- Are there particular critical points where an appropriate intervention could improve progress and completion rates?
- How are changes in the composition of the graduate study body and in fields of interest changing how science is being done?
- What effect, if any, do Federal decisions about stipend levels or benefits policies have on the climate in departments, social structure and who succeeds and who doesn't?
- If it is true that some investigators are starting to shift their lab teams toward more productive mixes of technicians and postdocs rather than expensive, less productive

graduate students, what effect might this have on the science?

The results so far are inconclusive but it would appear that we cannot "buy" students.

It also seems evident that we need to rethink our indices of quality since some of the easiest measures lack predictive value. How can we predict whether a particular student is likely to negotiate the transition from dependency to independence successfully? What is independence going to mean anyhow in the future if we anticipate many fewer positions for independent investigators? Right now, only one quarter of all new faculty hires are full-time, tenure track. The rest are either part time or fixed term. What is happening to career pathways in government and in the private sector? What kinds of jobs are being generated? How well are our students prepared to compete for those jobs?

- (4) How should we set the levels of stipends and the cost of education/institutional allowance? What are the appropriate reference points and how would we adjust the levels of these two components of the support package over time?

There are important differences between educational cost (what it costs an institution to educate a student at a particular level), list or sticker price and what a student actually pays. Which of these should be the reference point for setting COE?

There are also questions about how much of the cost of graduate study should be borne by the student or his or her family, by the institution and by the public, through either Federal or state funds. We have worked that out at the undergraduate level, although the compact is clearly on its way to being renegotiated, but how about at the graduate level? Should NSF's COE defray the full institutional cost of educating a student at the graduate level? How would we calculate that cost?

For stipends, what have we learned about the influence of stipend level on student interest in pursuing graduate study and student persistence? A few years ago, the complaint was that the NSF stipend was below the poverty line for a family of three and many graduate students were eligible for foodstamps. The recent rapid increase was to move the graduate stipend to a reasonable level that would be less than what a newly minted bachelor's degree recipient might command in the workplace, but not so much below that potential applicants with a heavy debt burden from undergraduate school would be loathe to continue to graduate school. Yesterday, I heard a complaint that the stipend was nearly \$10,000 more than the cost of living in North Carolina. I am not sure, of course, how that figure was reached, but I would conclude that we should hold where we are for a while until we have studied again where the "minimum standard of living" line is drawn.

Perhaps of greater importance, we need to examine the policy levers we have. If stipend level is not a

particularly effective lever, what can we do instead to pursue our Federal policy goals through investment in graduate education?

We are seriously studying the cost of education allowance. Our three programs in DGE are meant to accomplish particular policy goals. We do not wish them to draw resources away from other institutional purposes or to set up bad dynamics and tensions within departments or to become a burden for institutions. At the same time, the campus economies that have shifted the pattern of costs and the rising costs that now threaten the flexibility that many institutions have enjoyed are complex. We do not wish to be held hostage to many local campus economies and trades and affiliations that have, in the past, benefited from the fact that NSF was generous and actually pegged the COE in such a way that many campuses received more than their actual costs. Workshops like this one help us understand how graduate deans and academic deans and chairs are juggling the many demands on their discretionary accounts and how the unintended consequences of both the stipend levels and COE allowances are playing out against a background of cuts in state general fund support for higher education.

How should we think about the overall package, including health care and professional benefits such as travel to meetings? What is basic and what is not?

We need to document and understand the nature of the institutional response to our graduate education

programs and explore the range of variation in these responses.

- (5) Are our policies and approaches to implementation of our policy goals based on an increasingly outmoded idea about who our students are and what is happening in the STEM workforce? Are we supplying students who are ill-prepared for the real demand? How can our fellowships accommodate alternative pathways to advanced degrees?

The argument was made several times yesterday that many students who enroll in doctoral programs are (a) masters students who have decided to go ahead and pursue a PhD; (b) midcareer professionals who now want to return to obtain a doctorate; (c) international students.

Our policies currently assume that doctoral students are enrolling for the first time in a graduate program and are fresh out of college. What proportion of students who wish to obtain a doctorate actually are like that? Given the rapid demographic changes at the undergraduate level, my guess is that the graduate population is also changing. We will revisit this issue and study whether we need to make some changes in our eligibility requirements and assumptions.

Several people also raised issues about the relative absence of masters level education in our portfolio. We do support masters study, but largely in our technological education portfolio and in teacher preparation. Should we be supporting students who

enroll in professional STEM masters programs? If so, why? What is the Federal role in either promoting this educational model or in encouraging student participation by offering fellowships or traineeships? What is the role of employers or the marketplace? If there is a demand for this kind of credential, will entrepreneurial universities respond?

Notes prepared by Judith Ramaley, June 18, 2004