

DIFFUSING GRADUATE REFORM INITIATIVES IN THE SCIENCES:

HOW MIGHT “INSTITUTIONALIZATION” REALLY WORK?

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Calls for innovation and reform in graduate education are now ubiquitous. Many federal agencies and foundations fund national efforts to initiate graduate reform movements, and these programs have no doubt benefited faculty and students who have been directly involved. But most of these programs carry an expectation that universities will attempt to diffuse or “institutionalize” the funded interventions beyond the original participants. As a result, administrators face a practical question: What conditions make it more likely that an isolated innovation or reform will be diffused? This paper will address several strategies that may facilitate institutionalization of higher education reforms.

An Example: The Carnegie Initiative on the Doctorate and the University of Nebraska-Lincoln Department of Mathematics

The Carnegie Initiative on the Doctorate (CID) is a multi-year research and action project designed to support efforts to more purposefully structure doctoral education in six core disciplines. The Carnegie Foundation believes that it is time to return to first principles, and so the project centers on the essential question, “What is the purpose of doctoral education?” The initiative has three interacting elements: a conceptual analysis of doctoral education, design experiments in departments, and research and dissemination about the process used by departments to reform doctoral education. Faculty and departmental leadership in the disciplines is a crucial focus of the initiative. Chris Golde, senior scientist for the CID, states that the project sought departments that are committed to being “stewards” of the discipline. Specifically, they selected departments that have a keen sense of the heart and essence of the field, but also have a critical eye toward the future—and those departments willing to take risks to advance doctoral education in the discipline.

The University of Nebraska-Lincoln’s (UNL’s) Department of Mathematics was selected as one of eight Math departments nationwide to participate in the CID. The questions that UNL’s Math department will address in their CID project include:

- Is a curriculum emphasizing broad knowledge of mainstream mathematics still appropriate?
- What revisions of our curriculum and degree requirements are necessary in order to accommodate interdisciplinary research?
- How do we best prepare Ph.D. students for the jobs they will actually obtain?
- How can we increase recruitment and retention of underrepresented minorities?

The UNL administration was pleased to have the Mathematics department included in the CID, and it was obvious that the questions they were posing for themselves were valuable. But it was equally obvious that other departments on campus were ready to undergo a similar reform process, and could benefit from the kind of activities that Mathematics would experience during the CID. The task faced by the Office of Graduate Studies then, was to develop a plan for diffusing the process and outcomes of the CID project to other departments on campus. As a starting point for this plan, two recent studies of higher education reform were reviewed.

Models of Change in Higher Education

Two recent empirical studies have investigated the conditions under which innovation and reform are best diffused in higher education. Eckel, Green and Hill (2001) surveyed 26 diverse institutions that sought to institutionalize reform initiatives. They studied factors that facilitated both the depth and pervasiveness of resulting change. Quehl, Bergquist and Subbiondo (1999) surveyed 49 universities to understand the diffusion of innovation in the pursuit of improved academic quality. Results from these two studies suggest a series of specific recommendations concerning the conditions that may facilitate reform, and the actions that administrators can take to maximize the effects of these conditions. The following discussion uses UNL's attempt to diffuse the CID reform process as a context for illustrating these recommendations.

Conditions that Facilitate Reform I

Look for propitious external environments and internal conditions.

A "propitious" external environment certainly exists. There is considerable agreement about the need for change in graduate education, especially in the sciences. Examinations as narrow as the 1995 COSEPUP report on reshaping graduate education in engineering and the sciences, and as broad as the 2001 Pew report on doctoral education suggest that a new approach is needed. This approach should emphasize adaptability and versatility as well as technical proficiency. Furthermore, professional organizations and funding agencies now ubiquitously call for the diffusion and institutionalization of these reform initiatives.

At UNL, equally propitious internal conditions also exist. In 2000, faculty leaders developed a strategic plan for the future of graduate education and research on our campus. This plan states that “Graduate programs are preparing future professionals in the professorate, in professional practice, in public policy roles and in private research and industry. We need institutionalized programs that will prepare students’ career paths in the wide range of positions taken by our graduates” (Future Nebraska Task Force, 2000, p. 39).

Clearly the internal and external environments on most university campuses provide sufficient support and motivation for graduate reform initiatives.

Conditions that Facilitate Reform II

Think locally, but look globally when conceptualizing.

The reform literature suggests that nearly every effective local innovation has a national model as a guide, and these models are most acceptable when they come from a credible source. Given this, the CID project provides an ideal model to use as the basis for local diffusion efforts. The Carnegie Foundation has significant status and credibility among faculty across all disciplines. Modeling a local UNL initiative after the Carnegie project would likely create interest in the local initiative.

Given this, UNL will create the “Nebraska Initiative on the Doctorate (NID),” closely modeled after the CID. UNL will commit funding to provide many of the same resources and incentives that Carnegie provides to CID participants, including:

- Structural framework: the milestones for progress and timelines;
- Materials and tools: commissioned essays, materials that help faculty document and reflect on student and faculty experiences in the doctoral program;
- Site visits: a consulting team that serves as a sounding board and provides assistance;
- Moral support: assistance of many kinds at key points in the project.

The UNL Mathematics department will serve as a communications conduit to the CID and will partner with other UNL departments to share CID materials and resources. The ultimate goal is to literally diffuse the CID model to additional UNL departments by combining UNL funding and shared materials from Carnegie.

Conditions that Facilitate Reform III

First think small and simply, then more expansively.

The next logical administrative question is: Which departments ought to be included in the local reform initiative? While it may seem wise to have ambitious goals for institutionalizing a reform project, the literature suggests that a more controlled phase-in is more likely to succeed. The CID is a multi-year project, and so it might be logical to phase in a small number of UNL departments during each year of the Math department's involvement in CID. Perhaps UNL could accommodate two new departments per year in the NID, so that administrative and fiscal resources are likely to be sufficient to ensure the success of the project.

The two research studies cited above suggest that selecting the departments to include in a reform initiative should be done thoughtfully. The innovation must be on the right topic at the right time in the department's development. Department leaders must be able to frame a positive change agenda and honor unique norms of governance in the department when designing the specific reform processes to be employed. Finally, most successful initiatives require that the department faculty feel some sense of urgency for reform and be ready to follow self-imposed deadlines to move the project forward.

Conditions that Facilitate Reform IV

It takes sufficient money, time and institutional commitment.

Both studies demonstrate that it is a mistake to begin an innovation without a commitment to ongoing funding and support. The institution must view such commitments as investments designed to support important forms of academic change. Institutional commitments can take many forms, but should include public commitment from university, college and department administrators. Empirical results suggest that release time for faculty and staff is highly correlated with success of reform initiatives.

Conditions that Facilitate Reform V

Leaders with attitudes and strategies that facilitate change are needed.

Reforms are most successful when leaders help people develop new ways of thinking, intentionally create time and space to examine the status quo, and design opportunities for engagement with outsiders and new ideas. Both studies cited above report that leaders of successful reforms paid attention to the change process and adjusted their actions as needed, and understood that

process issues are often a source of contention (e.g., who is consulted, how decisions are made). Finally, effective leaders of reform projects were willing to balance speed, deliberation and persistence as they moved through the change process.

Summary

Graduate deans and other campus administrators face the practical task of diffusing isolated reform initiatives. While most funding agencies expect reforms to be institutionalized, few systematic efforts to diffuse reforms actually occur. The purpose of this paper was to describe straightforward and concrete issues for administrators to consider when attempting to diffuse reforms. The results of two empirical studies suggest that administrators should: create environments that urge change; base local reforms on the diffusion of credible national innovations; start small and then expand by selecting departments that are ready for change; begin an innovation only if on-going support exists; and provide leadership that facilitates change.

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