FEATURED PAPER SESSION:

Institutional Change and Sustainability: Lessons Learned from MSPs

MSP RETA Project:
Change and Sustainability in Higher Education (CASHÉ)

Nancy Shapiro & Jennifer Frank

January 25, 2010 · Washington, DC
Presented at 2010 Math and Science Partnership Learning Network Conference

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See the Exercise Sheet on Page 12:

Analyze and Discuss Change and Sustainability
in Your MSP Project

Cover graphic: Presenters Nancy Shapiro (center left) and Jennifer Frank (center right) in discussion with participants

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About This Summary

This documentation of the 2010 Math and Science Partnership Learning Network Conference offers a brief summary of the presentations that took place during one conference breakout session and focuses on questions, answers and discussions during the session.

Readers interested in pursuing information about the project discussed in this breakout session are encouraged to visit MSPnet to access the full PowerPoint presentation.

The abstract for this presentation is posted on MSPnet at the following URL:

http://hub.mspnet.org/media/data/11_Frank.pdf?media_000000006498.pdf

More from LNC 2010 on MSPnet

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www.MSPnet.org

INSTITUTIONAL CHANGE AND SUSTAINABILITY: LESSONS LEARNED FROM MSPs

Project Recap

Nancy Shapiro welcomes the group to a session on lessons learned by the Change and Sustainability in Higher Eduction (CASHÉ) project over the past four years. This study of MSP projects focused in particular on issues of change and sustainability. The project has been completed, has generated findings and recommendations. The intent, Shapiro explains, is to use this breakout session as a sounding board for some of those recommendations, which will be presented to the project advisory board in the coming week.

Jennifer Frank offers a sense of context by providing a brief overview of the project (*see sidebar and below*).

CASHÉ Project Background

- USM's history of system-level involvement in STEM education and P-20 partnership work

- CASHÉ funded as a Knowledge Management Dissemination (KMD) project, supplement to VIP K-16 Targeted MSP

- Study the key feature of institutional change and sustainability among higher education institutions with MSPs

The overarching questions the CASHÉ project addressed are outlined below.

Overarching Questions

- What can we learn about MSP-supported changes that have expanded institutional capacity to support the reform of P-20 STEM education and the meaningful engagement of faculty in this enterprise?

- What strategies are MSP institutions using to sustain these developments over time, particularly once NSF funding ends?

Frank also reviews project assumptions about institutional change, which are grounded in some of the organizational leadership and theory literature in higher education.

Assumptions about Institutional Change

- Change in higher education requires more than top down leadership

- Grassroots leadership (faculty, administrative), which is frequently found in MSPs, may require support from top down leaders

- Institutional culture shapes change processes and leadership

- Change processes may also require change in institutional culture to be sustainable

CASHÉ Project Components

- Analysis of MSP project-related data, including annual reports, evaluation reports, and submissions to the MSP management information system

- Analysis of new programs, courses, and curricula generated by MSP projects

- Documentation at national meetings of participating STEM faculty

- Six MSP project site visits

- External national advisory board

Analysis of Data from MSP Site Visits

- Data sources: interview notes and transcripts, project artifacts (e.g., annual reports, project-related publications)

- Formed descriptive categories for the data, aligned with our research questions, and tracked emerging themes across various data sources

- Within-case and cross-case analyses

Resource: CASHÉ Methodology Report

A report on the methodologies used by CASHÉ will be posted in the future on MSPnet.

Frank then offers an overview of the components of this four-year project. She underscores the point that the focus of all of these components was on types of activities happening on the higher education side of the partnerships. The site visits to MSP projects involved various types of projects, and projects at various stages of implementation. The external advisory board was a cross-representative group that included institutional leaders, higher education associations, people studying teaching and learning from a variety of perspectives within and outside STEM, STEM and education faculty, and members of MSP projects.

Site visit teams were comprised of a combination of project staff from CASHÉ as well as members of the advisory board. The project developed a research protocol and looked at various data sources. The CASHÉ team met with a wide range of people involved with the MSP during these site visits, including project leaders, PIs, Co-PIs, participating faculty, deans, collaborators on the K-12 side, and in some cases provosts. The team looked at common themes across the sites visited as well as points of departure.

This was not an evaluative study, Frank notes. The assumption was that many factors—the institutional culture, history, mission, context—would be shaping how the change processes played out in individual campuses and the way and extent to which these projects were approaching the sustainability of their work. The goal was to identify lessons that could be learned across the MSP portfolio or experience that could inform knowledge about change and sustainability moving forward.

Nancy Shapiro then offers an overview of categories of findings from the CASHÉ project. "How do you study change?" she asks. "How do you look at what's happening? How do you decide where things started? How do you figure out the impact of various interventions? Another thing that NSF wanted us to tackle was, how do you define sustainability?" It is somewhat difficult to figure out sustainability if you're observing projects in process because they don't know how they are going to be sustained, Shapiro observes.

She outlines the following themes that emerged from the wealth of evidence collected by the project and encourages MSP members to think about their own individual projects in relation to each of these themes. In brief, the type of institution matters when asking questions about change and sustainability, as does the role of

Categories of CASHÉ Findings

- Backdrop of Institutional Culture/Context

- Role of MSP Project Leaders

- Impact of Institutional Leadership/Support

- Investment/Motivation of Participating Faculty

- Structural Changes that Supported and/or Resulted from MSP Work

- Course/Curricular Changes that Supported and/or Resulted from MSP Work

- Question of Sustainability

MSP project leaders and who those leaders were. Institutional leadership and support, as well as the investment and motivation of participating faculty also have an impact.

Regarding structural changes, Shapiro notes that the CASHÉ team found projects that invented or created new structures that hadn't previously existed. Where no prior structure existed to bring K-12 and higher education together, some projects founded institutes or other vehicles to allow that work to happen.

Course and curricular changes that supported and/or resulted from MSP work include new programs such as a new masters program in STEM education, which was a sustainable change that didn't exist before. And finally, there is the question of sustainability. The findings of the CASHÉ project have been organized around these seven categories or themes.

Group Exercise:
Assessing Your MSP Project

Nancy Shapiro poses an exercise for group participants so that they may consider some of the key CASHÉ themes in relation to their own MSP projects, using the rating scale in the sidebar.

1. Where would put your MSP on the continuum from low to high as a named institutional priority? How would you back that up if somebody asked why you picked that number?

2. CASHÉ found a continuum of faculty engagement from work that was considered primar-ily outreach community service with K-12 teachers all the way through to work considered scholarship of teaching and learning, involving faculty who published and were rewarded for the work they were doing in changing the way teaching science and math courses at universities take place. Where would you situate the faculty in your MSP project on that continuum?

3. To what extent do you think that the work you have done so far is going to be a sustainable part of the institution(s) involved in your MSP going forward or the partnership going forward? What are some of the reasons for the position you chose along the continuum from "unlikely" to "likely"?

Participants first worked individually, rating their own MSPs, and then discussed their ratings with others at their table. The ratings and discussion topics were then shared with the group at large.

For Discussion

MSP as an Institutional Priority
1   to   5

< _____ >
Low   High

Types of Faculty Engagement in MSP
1   to   5

< _____ >
Outreach/Service   Scholarship

MSP Sustainability (Institutional/Partnership)
1   to   5

< _____ >
Unlikely   Likely

Engaging in the group exercise

Definition of "Institution"

• How do you define "institution"? A number of folks at our table were working with multiple institutions. I'm at a Tier I Ivy League institution in Philadelphia. We run two masters degree programs that were created from this MSP funding. The program is very valued by the Chemistry Department, from which we grew, and when we asked the faculty whether they want to keep this going they were very enthused. Maybe less so at the School of Arts and Sciences where you've got all of the different departments. Then when you get to the university level the response is, "Who is the Penn Science Teacher Institute?" So again, it depends on how you define "institution." • **Participant**

Nancy Shapiro

Responses: Institutional Priority Scale

Shapiro asks participants to identify where they placed their project along the institutional priority scale and why.

The Highest Priority:
Bringing Money to the University

• I'd rate ours both high and low. As a school that's trying to get into Tier I external funding it's a high priority. Any grant, including MSP, is a very high priority. From the point of view of what MSP is trying to do, I'd give it a much lower priority. • **Participant**

• I would imagine that is pretty typical on a research campus where the research agenda doesn't necessarily include research with K-12 schools or outreach with K-12 schools. • **Nancy Shapiro**

• I'd agree with the first response. When you start talking about indicators of priority—time, resources, release time for those of us working on it—I would say it's at a one. We are a START MSP though, and don't have a lot of money. Maybe if we were a Targeted MSP bringing in more money it would move up, but it's highly connected to the ability to bring money to the university. • **Participant**

Changing Administration and Economy

• We're now in the seventh year of PRISM I (we got Phase II, but I'm going to focus on PRISM I). It took us several years to get to "high" and as I was considering what we are now, I realized our entire administration, from de-partment heads all the way to our president, has changed and all of this took place in one year. That has had a major impact, so if you asked me what the rating is now I'd have to shift it downward. I think it's a matter of time and saying, "We've accomplished this much, let's keep it going." Another thing that I've noticed, now that I'm at the administrative level, is that the economy has a major impact and it's trickling down to institutions. • **Participant**

• Is it trickling down in a way that makes it more responsive to K-12 needs, or is it trickling down in a way that's making institutions more protective of what they have and feeling they don't have time to go out to the schools anymore? • **Nancy Shapiro**

• If it's anything having to do with money, it's being cut and money is being shifted to other things. • **Participant**

The President's Pet Project

• We have a totally different spin and it's almost too good to be true. We're from the University of Kentucky and we are considered the President's pet project. He started a partnership institute in math and science which they now fund, so we're now actually on the Provost account. We haven't had raises in three years and there was a hiring freeze for the past three years, but the institute hired three faculty members that are fifty percent full-time outreach professors. We're currently in our seventh or eighth year. • **Participant**

- That's a really good example on the high end of institutional priority, where they put new lines in place. That's good evidence. • **Nancy Shapiro**

Embedded after a Decade of Effort

- I'll put yet another spin on this but repeat some themes. I come from the University of Texas at Austin. We have a relatively new MSP called UTeachEngineering. We had a very successful program called UTeach that trained math and science teachers, and although we're a new program we are very much embedded in that culture and in that system. That began as a pet project of a dean who sold it at the provost level. It took a decade of effort for them to really institutionalize it.

  Coming in as a relative newcomer, what I'm finding is that what others have said still rings true, but there are somewhat different elements. One is, money talks at Tier I institutions. What our administrators have come to realize is that it's not just money from NSF, it's the money from private donors. Students vote with their feet with programs that can become very popular, and that in turn makes a difference in how the money flows within the institution. Once these programs have become really embedded, they have other mechanisms beyond going to the NSF for another grant. • **Participant**

- When we get to sustainability, we're going to come back to that notion. What role does NSF play and what role should it play? Are there a range of roles it can play? • **Nancy Shapiro**

Buy-In at High Levels

- The more buy-in you have and the higher up you go, the more it seems to be sustainable. At our university the provost was really behind what happened and in fact was the Co-PI on the MSP project. Things really happened. That was extremely helpful. • **Participant**

- We are working with the Association of Public and Land-grant Universities to do a survey of provosts to find out just how much they know about the partnership work that is going on on their campuses. We think we are going to raise visibility just by asking the question. That's related to what we're learning. It can't just be top-down, but there does need to be some awareness up there. **Nancy Shapiro**

Responses: Faculty Engagement

Skewed Values in the Continuum

- I have several responses tor this. The way you've done your diagram is, in fact, the way these are valued. If we go back to Boyer and Braxton and others, it is not a continuum as it appears here. If we take away the kind of service which is citizenship service and use Boyer's definition of "application," where the professors are applying their knowledge to the area, in fact that is scholarship. So it is a circle, and outreach and scholarship are right there together. It's unfortunate the continuum looks like that because I happen to think that people who are engaged in a high level of the

Reselling the Program as Administrators Change

- There is one more element to add to the UTeach story. As individuals cycle through dean and provost positions, you continually have to resell the program. We just switched deans. It has taken us a year to get the new dean to where the previous dean had been. • **Participant**

- That is tough because to what extent is it personality driven or individually driven as opposed to culturally driven? When the faculty say they want to keep going with it, that's one kind of sustainability. When the dean says, "That was then, this is now," that's another challenge. • **Nancy Shapiro**

Differences Between Targeted and Institute Partnerships

- Is it different for Targeted and Institute partnerships? It would seem that Institute partnerships, where you're developing some kind of track, have a built-in sustainability factor as opposed to a Targeted partnership where you're trying to work with multiple K-12 schools. It's a whole different sustainability animal. Are there different models? • **Participant**

- Yes, there are very different models. Let's get to that when we talk about sustainability. • **Nancy Shapiro**

Outreach as a Factor in Faculty Tenure: Top-Down vs. Bottom-Up

• In Georgia, part of the PRISM I project strategy was our work on institutional policy. The Board of Regents has now made it a policy for all institutions for faculty work in K-12 schools to count as a factor for tenure promotion. Now the question is, has it trickled down? • Participant

• That is another example of a top-down move. I have a Board of Regents and they could make a policy like this at the University System of Maryland and everyone would say yes, that's fine, we'll count it toward tenure and promotion after we've decided everything else. It's the question of how it is implemented. The only way it would be counted at the University of Maryland is if the faculty in the department said it was scholarship that counted. That is the kind of top-down, bottom-up issue that we're looking at. • Nancy Shapiro

Group discussion

application outreach in the partnerships are also doing a high level of scholarship.
• Participant

• What we are looking at and what we are going to be saying in terms of our recommendations is exactly that. There needs to be a definition of scholarship that incorporates this work. The University of Kentucky is a good example. They have hired three outreach professors. What's an outreach professor? If it is a tenured faculty member who is doing work that applies the scholarship of teaching and learning in that institution, that's a kind of value that we need to document. We need to give examples and show institutions that this might be a little risky but is a step in the right direction. • Nancy Shapiro

Funding Doctoral Students to Conduct Research

• I'm at the University of Illinois and the main thing about this project is that we do have tenure track faculty members doing the outreach service, but they recognize that there is not any scholarship being produced about that work. What they have done is to fund my work as a doctoral student to do some research. They are funding a couple of us as we do our dissertation research so that we do get some scholarship out there and we do document what's happening. I get to learn from these wonderful faculty members as they serve these K-12 teachers. This is the first year that we are doing this, so who knows if it will work out, but it allows for that circle to continue

and also brings in some new people—I'm new to this. • Participant

• That's one of the things that we've got to write down. That notion of bringing graduate students in to do the study is evidence, from our perspective, of institutions weighing in on the scholarship of this work. If you have graduate students whom you are funding to do research on this project, then you are moving away from what we think of as service and moving it into the institution. Nancy Zimpher's talk was a wonderful lead-in to the kinds of work that we are doing (*see plenary session summaries in MSP: An Intergenerational Learning Network available on MSPnet.org*. She talks about the need to produce evidence- and outcomes-based design in order to measure these interventions. That's part of what it is all about, and certainly part of what NSF is all about. Nancy Shapiro

Responses: Sustainability

Overburdened Individuals & Lack of Infrastructure

• We are a START MSP. I'm at an HBCU in Maryland, which has just gotten doctoral research certification. We went from a service school to a doctorate granting school. When you start talking about sustainability and whether you can institutionally sustain something, it has become so connected to others valuing it as scholarship. Can you write papers on it? Can you get it published? The problem that

we're having is that in my department there are two of us. I'm a Co-PI, I'm doing all the service, I'm doing all the research, and I have one graduate assistant. The reality is that it's not sustainable because it's burdening the faculty. For those of us who take this on, it's over and above the other stuff that we are asked to do. So yes, it is kind of sustained on my back but if I fall out, that's it because there's no infrastructure to support this kind of work. And yet it's in our mission that we are going to outreach to schools and urban districts.

- That is a perfect example of the conundrum that the MSP projects ended up with in our experience. The NSF is trying to do something that is atypical for what faculty work is about, and yet it is extremely visionary, goal-driven work that MSPs are doing. If we don't make this a part of what universities think about then we are missing the boat, just like Nicholas Kristof said ("Our Greatest National Shame," *New York Times*, http://www. nytimes.com/2009/02/15/opinion/15kristof. html?_r=1). • **Nancy Shapiro**

Findings and Recommendations

Shapiro closes the session with a review of the CASHÉ project's findings and recommendations, noting that much of this will sound familiar given the group discussion that just transpired.

Regarding the importance of recognition and

rewards, Shapiro notes that there are a wide range of rewards, with tenure obviously at the top of the continuum. Other rewards have included teaching awards, summer stipends or scholarships, and opportunities to do research in schools out of state or out of the country.

New structures have included boundary-spanning positions, and CASHÉ will be conducting surveys about that as well. A faculty member who has 51% in one department and 49% in another department who comes up for tenure is not in a happy place to be, Shapiro notes. CASHÉ has documented a variety of boundary-spanning positions. Colorado is employing an interesting model that involves appointing two faculty, one in physics and one in education, to spend 66.6% in one department and 33.3% in another. Those two people come up for tenure together in their departments and there is conversation that takes place between education and physics that educates both.

Another question is how to rethink the roles of administrative faculty and staff, those who are project directors or center directors, who may have a Ph.D. but are not tenure track faculty. There is no career path for those people at universities.

There is also the "closing the loop" question. How do you connect the MSP to the core educational mission of the institution? This is what Nancy Zimpher was talking about during her plenary presentation at this conference, Shapiro notes. IHEs prepare the teachers who teach the kids. The better prepared the teach-

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Lessons Learned

Leadership Matters:
- Critical roles of provosts, deans, and department chairs
- Need for both bottom-up faculty leadership and top-down advocacy and support
- Importance of recognition and rewards

New Structures:
- Boundary spanning positions (e.g., joint faculty appointments, education appointments in STEM departments and vice versa)
- Role of administrative faculty/staff
- Creation of multi-disciplinary STEM centers and/or partnership outreach units

Closing the Loop:
- Challenges to connecting MSP to the core educational mission of the institution
- Undergraduate education reform in STEM as a by-product of involvement in K-12
- Investment in P-20 STEM pipeline is in the interest of the institution
- New directions for research, scholarship, and substantive faculty work in these areas

Sustainability:
- Tangible outcomes: new courses and programs for in-service and pre-service K-12 teachers, reformed undergraduate courses, creation of campus centers or outreach units, and in a few cases, commitment to new faculty lines
- Concerns about maintaining viability of the above in the absence of ongoing incentives/support for participating faculty, teachers, and students
- Frequent succession plan was to secure additional external funding

ers are, the better prepared the kids will be to succeed in higher education. Investment in the P-20 STEM pipeline is a self-interested model on the part of IHEs, she observes, and you can play on that self interest.

In terms of sustainability, CASHÉ has documented tangible outcomes in the form of new courses and programs for inservice and preservice K-12 teachers; reformed undergraduate courses; creation of campus centers or outreach units; and in a few cases, commitment to new faculty lines. These are real, solid evidence that there are sustainable changes going on as a result of MSP. There are, however, concerns about maintaining the viability of these outcomes in the absence of incentives or support.

CASHÉ has also generated a list of recommendations. One of the recommendations to NSF is that it is okay to measure sustainability in two different ways. There is sustainability of the sort seen in the Texas model: NSF money starts UTeachEngineering, but then diverse sources of money come in. You begin something with start-up money and it takes off. The other kind of sustainability is what NSF does in all of its other directorates: it funds faculty to continue to do research via centers and labs, and that funding continues for twenty to thirty years. The recommendation is, don't think of this as education research, think of this as any of the other NSF research that is funded that allows recipients to sustain that research with grants which leads to credits for tenure and promotion

and offers the cachet that is lacking in one-time funding.

Shapiro reviews the other recommendations for NSF, college and university leaders and higher education faculty and disciplinary societies, noting that these are still evolving (*sidebar and below*).

In closing, she requests feedback on the questions below.

Request for Feedback

- Where should a report like this go?
- How could these recommendations be moved forward in a way that they could have an impact on your campus?
- Are there other potential audiences for these recommendations?

   Send feedback to: nshapiro@usmd.edu

The exercise sheet on the following page may be used by MSP projects to initiate their own discussions about change and sustainability.

Exercise Sheet for MSP Projects

Consider the current status of your MSP project in each of the categories below.

1. Institutional Priority

Where would put your MSP on the continuum from low to high as a named institutional priority? How would you back that up if somebody asked why you picked that number?

MSP as an Institutional Priority

1   to   5

<_____>
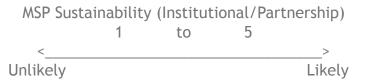Low   High

2. Faculty Engagement

There is a continuum of faculty engagement, from work that is considered primarily outreach community service with K-12 teachers all the way through to work considered scholarship of teaching and learning, involving faculty who publish and are rewarded for the work they are doing in changing the way teaching science and math courses at universities take place. Where would you situate the faculty in your MSP project on that continuum?

Types of Faculty Engagement in MSP

1   to   5

<_____>
Outreach/Service   Scholarship

3. Sustainability

To what extent do you think that the work you have done so far is going to be a sustainable part of the institution(s) involved in your MSP going forward or the partnership going forward? What are some of the reasons for the position you chose along the continuum from "unlikely" to "likely"?

MSP Sustainability (Institutional/Partnership)

1   to   5

<_____>
Unlikely   Likely

Analyze and Discuss Change and Sustainability in *Your* MSP Project

• Make copies of this page for members of your MSP project.

• Have project members first work individually as they consider the questions and rate the MSP in each category.

• Come together as a group and discuss your responses and ratings. Whenever possible, use evidence to explain your responses.

• What relevance do the CASHÉ "Lessons Learned" and "Recommendations" outlined in this document have for your MSP?