1. Questions(s) or issue(s) for dialogue at Learning Network Conference session:

The Promoting Institutional Change to Strengthen Science Teacher Preparation project is a collaboration among 26 public research universities (The Leadership Collaborative (TLC)) that seeks to understand the conditions that promote institutional change that sustains their efforts to strengthen their science teacher preparation programs. This project is a partnership between the Association for Public and Land-grant Universities (A·P·L·U) - whose members are represented by their Presidents and Provosts, and several science disciplinary societies especially the American Physical Society (APS). TLC universities are submitting action plans for strengthening science teacher preparation within an institutional context of change and sustainability, and will identify common challenges and share successful strategies.

For the MSP research conference, we are focusing on a small but important component of the environment/structure - how disciplinary faculty are appointed and rewarded for their engagement in science education and teacher preparation. Drawing upon participants own experiences and research, the questions that we would like to have a dialogue on at the Learning Network Conference include:

1) Are there preferable organizational (departmental) structures that are more conducive to effective recognition of disciplinary faculty’s involvement in STEM education?
2) How do institutions evaluate and give weight to this type of faculty work?
3) Are there successful models of recognition and reward and what is the environmental context in which these successful models occur?

2. Context of the work within the STEM education literature and within your MSP project:

This study is a meta-analysis of research conducted since 1995 on promoting institutional change in STEM undergraduate education. Henderson et al. found that most change strategies could be described by a 2x2 matrix, with the change impacting either individuals or environment and being either prescribed or emergent. In the context of our RETA project, we are using this framework to categorize how the 26 institutions of higher education are approaching change to strengthen science teacher preparation on their campuses. Our general theory of action is that change is successful when institutional senior leadership partners with those at the operational level to formalize and sustain the effort – and that A·P·L·U + APS adds value by promoting and legitimizing these efforts. Within the Henderson et al. framework, we hypothesize that change at the environmental/structure level is successfully undertaken only when senior leadership is engaged in the endeavor.
This study has provided insight on how earlier MSP work affected (or not) faculty and faculty reward structures at participating universities, and what conditions need to be in place to support sustained change.

3. Claim(s) or hypothesis(es) examined in the work (anticipating that veteran projects will have claims, newer projects will have hypotheses):

Within the narrower focus of one aspect of environmental change, we hypothesize that there are some structures of disciplinary-education faculty appointment that are more conducive to successful roles and recognition than others. We also hypothesize that the success of these role & reward structures will depend on several factors including:

1) the level of engagement by university leadership in the Promoting Institutional Change to Strengthen Teacher Preparation RETA. TLC teams with sustained engagement by more senior university leadership in this RETA will have more successful rewards structures.
2) the institutional environment or culture that values STEM teacher preparation and STEM teaching. Institutions that have a history of supporting STEM teacher preparation will have more successful rewards structures—one measure being attainment of external resources (i.e. PhysTEC, UTeach, and Noyce scholarships).

4. Evaluation and/or research design, data collection and analysis:

A survey is under development to assess the organizational structure of disciplinary-education appointments in our 26 partnering universities. In January, we will hold the second annual TLC conference where we will discuss the survey with the participants. We will ask for feedback on who should complete the survey at their institution as well as on the content and wording of the survey. We anticipate that this survey will assess what kinds of faculty appointment structures and rewards are currently in place at each institution. Questions will most likely include:

1) What are the organizational (departmental) structures in place for disciplinary faculty involvement in STEM education at your institution?
2) How does your institution evaluate and give weight to this type of faculty work?
3) Is there a distinction between disciplinary education research that focuses on undergraduate instruction versus K-12 instruction?
4) What is the experience of faculty holding disciplinary-education research positions and/or teacher preparation positions with regard to roles and rewards? How many have received tenure, for example? How long do faculty stay in these positions?

We will relate our findings back to the body of data we have on each institution and their plans to strengthen science teacher preparation at their institutions.
5. Key insights (retrospective for veteran projects, prospective for newer projects) that have value for the Learning Network:

Based on preliminary discussions with the TLC team leaders, joint appointments may promote challenges that are avoided by other models of appointment. We also speculate that institutions with senior administration commitments can more easily overcome difficulties in the process of strengthening science teacher preparation.

References
