Research Category: Assessment of Models

This category contains ideas and questions surrounding the notion, what does success mean in holistic STEM FD? Assessment at all levels is a necessary component of implementing, evaluating, and sustaining holistic STEM FD. Four themes emerged under this category: (1) Formative Assessment, (2) Summative Assessment, (3) Systematic Assessment, and (4) Implementing Assessment. The themes described below each relate to one of these three levels of assessment within the overall model.

Formative assessment. This theme relates to the micro level of assessment that is specifically conducted to inform the model of STEM FD in terms of feasibility or in terms of understanding participant growth to know what to do next. This level of assessment does not relate to impact or overall effectiveness of a model, but rather how to use assessment to ensure the model is implemented with fidelity and that the model is meeting participant needs. Research in this area might center on whether faculty should have more ownership to decide when they should engage in certain types of FD, whether or not there are mechanisms for encouraging reflection with FD, and how we can go about assessing individual FD components. Questions might relate to establishing fidelity for those people conducting FD and ensuring that they are credible, in addition to looking broadly at fidelity and what factors affect fidelity during the FD process.

Summative assessment. This theme focuses on the meso level of assessment, or the overall impact of a model of STEM FD, specifically, whether or not the model was successful, and what is meant by success. While teaching is the most prevalent area of focus within this theme, research should expand beyond teaching when considering the overall impact of a holistic STEM FD model. Questions within the topic area of summative assessment might include: what are appropriate time cycles of evaluation of impact (year, multiple years); how do you assess or measure the effectiveness of FD (awarded grant dollars, student graduation rate, institution’s renewed accreditation); and which approaches or models cause greatest change (e.g. models that are semester long, over a year, over multiple years).

Systematic assessment. This theme focuses on the macro or global level of assessment. There are two foci within this theme, assessment related to how models of STEM FD might contribute to overall change at an institution and assessment in terms of STEM FD sustainability over time. Within this theme, one might move towards the development of a set of STEM faculty teaching competencies or expanding beyond teaching and identifying competencies across teaching, research, service, and leadership as well as interpersonal competencies. One might also work towards identifying a logic model that describes a STEM FD system and developing an assessment model for examining systemic FD programs over time. Questions emerging within this theme might include: how do we get faculty to evaluate teaching (for themselves and for others); how do teaching evaluations play a role in the development of effective models, how do you move away from customer satisfaction models in evaluations, and how can we measure organizational progress?

Implementing assessment. While the previous three themes within this category focus on the types of assessment that can occur within a model of STEM FD, this theme relates more to the process of conducting assessment (regardless of the type or level). It is unclear whether current
assessment practices in STEM FD are grounded in theories of learning or change theory and why faculty are not generally assessed like students. How might models of assessment accommodate for the limited amount of time available for assessment, the nonlinear pathway of development (interventions might not have an immediate effect but might act as an impetus for change), and the use of peer evaluation when peers are not trained properly on methods of evaluation? Questions emerging within this theme might include, should we be looking at perceptions, how can peer-observations (within and across departments) be counted towards faculty assessment, and what is the metric in which holistic STEM FD is assessed?