

ABSTRACT: 2019 ELAM Institutional Action Project

Project Title: Cultivating Psychological Safety and Resilience to Catalyze Science

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Topic Category: Research

Background, Significance of project: Psychological safety has been documented as a precursor for creativity, innovation and productivity, as well as a consistent characteristic of high performing teams. Defined as a shared belief held by members of a team that the team is safe for interpersonal risk-taking, enhancing psychological safety in the corporate culture is recognized as an opportunity to increase productivity, enhance overall employee satisfaction, retain top performing individuals and grow profit. These characteristics are often considered in parallel with qualities that define resilience, including a sense of connectedness, influence and optimism. While both are often focused on in business communities, there is clear relevance in academics as a prerequisite for developing interdependent teams to solve complex problems.

Purpose/Objectives: The objective of the current study was to acquire data to characterize the baseline perceptions of psychological safety and resilience of laboratory focused faculty at the West Virginia University (WVU) Health Sciences Center (HSC). Phase I was designed to; (1) review relevant literature, (2) establish approach including development of the IRB approved survey tool, (3) define target populations of interest to collect data and (4) analyze data to identify areas of opportunity for improvement.

Methods/Approach/Evaluation Strategy: We employed a mixed methods approach in analyzing open- and closed-ended data sets. The survey was administered to 300 faculty members at various stages of career. In addition to specific questions for which the responses were collected on a Likert scale of 1-5, participants were asked to indicate length of time at the Institution (< or > 5 years) and rank/academic track. Subsequent to the survey, interviews were completed with a subset of faculty to augment the survey data.

Outcomes/Results: Specific areas emerged that will drive focused efforts during the next 12 months (Phase II). These include, but are not limited to, observations around work-life integration, acceptance of mistakes as a critical part of learning, perception of a lack of influence related to decision making and sub-optimal familiarity/connectedness to colleagues outside of the survey participant's primary department.

Discussion/Conclusion: This project was initiated realizing there would not be an immediate metric for "success". Annual surveys and ongoing discussions will be indicators of progress and will highlight deficits for attention. Traditional metrics for academic productivity, retention of high-quality faculty and formation of innovative teams poised to take on challenging problems are outcomes that will be monitored. More telling, however, may be that discussions focused on safety and resilience become the norm and that an increased number of faculty enthusiastically recruit colleagues to the WVU HSC as the place to combine their unique talents with purpose.

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Background

Google's 2015 "Project Aristotle" put a spotlight on psychological safety, a term coined by Amy Edmonson in 1999, as the most consistent predictor of successful, high-performing teams. Defined as a shared belief held by the group that the team is safe for interpersonal risk-taking, this somewhat intangible quality translates to concrete outcomes. Increased effectiveness and revenue generation were just two metrics noted by Google for individuals that were part of psychologically safe teams. Enhancing psychological safety is also correlated with increased productivity, optimal employee satisfaction and retention of top-performing individuals. When combined with qualities that define resilience including connectedness, influence and optimism, an innovative culture can become the norm. While both are often focused on in business to drive profit margins and retention, there is clear relevance in academics to develop interdependent teams to solve complex problems that require a diversity of perspectives and collaboration.

Purpose/Objectives

The objective of Phase I of the study was to acquire data to establish baseline perceptions of psychological safety and resilience of laboratory focused faculty at the West Virginia University (WVU) Health Sciences Center (HSC). These data are intended to inform the design of strategies to enhance safety and resilience as part of an effort to improve key aspects of workplace culture and enhance scientific approach.

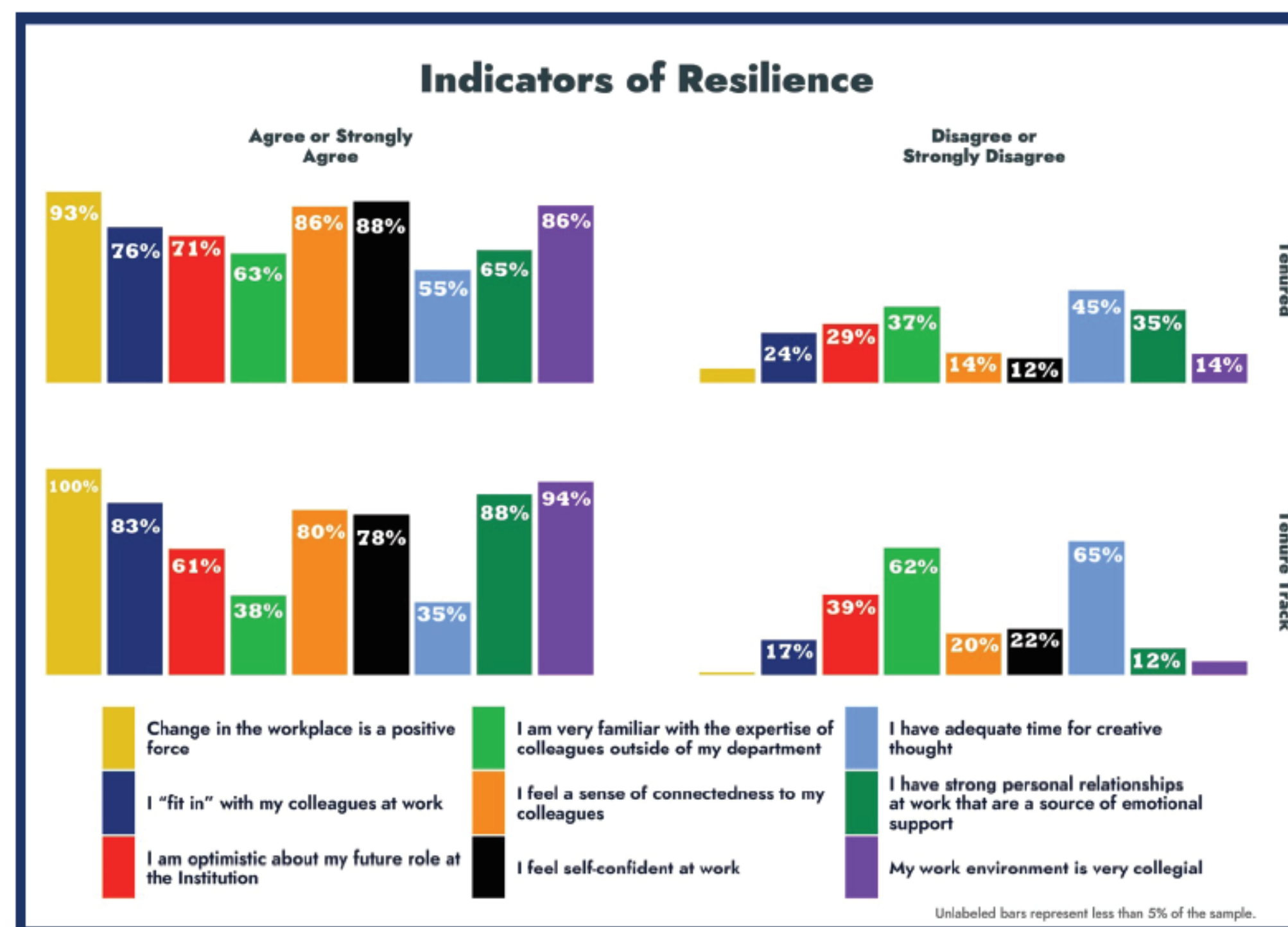
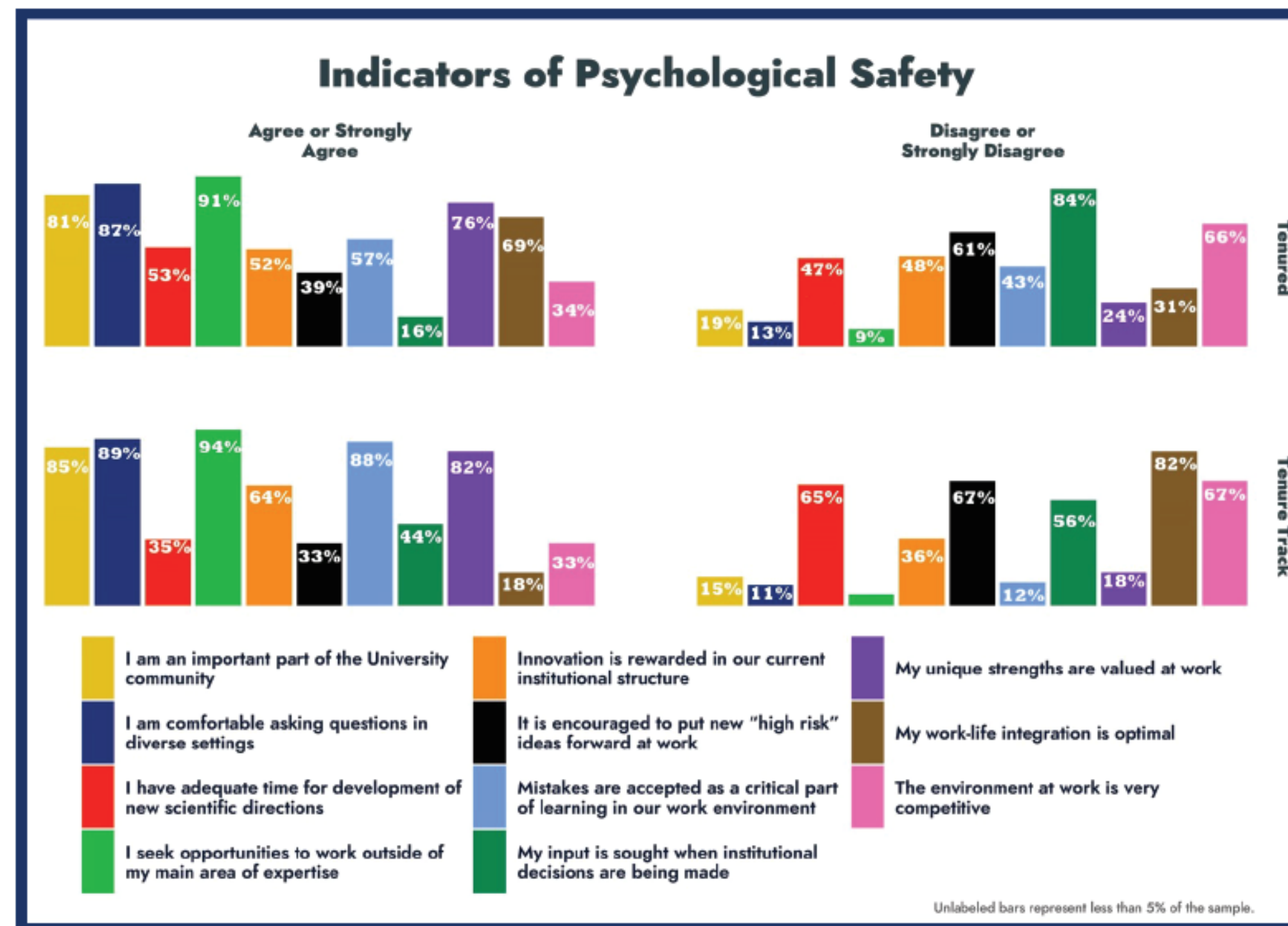
Methods

Phase I was designed to; (1) review relevant literature, (2) develop an IRB approved, de-identified survey modified from published measures of safety and resilience, (3) complete brief *one-on-one* interviews of a subset of surveyed faculty and (4) analyze data to identify areas of opportunity for improvement across key indicators.

We employed a mixed methods approach in analyzing open- and closed-ended data sets. To examine patterns within the responses to open-ended questions, we employed a hierarchical thematic analysis to denote emergent themes. Text mining and topic modeling were applied to examine patterns within the response sets. Incorporating Latent Dirichlet Allocation, words were clustered into topics using a Bayesian inference model, and then into themes, using n-grams which were compared to results of the thematic analysis that yielded the final indicators.

Results

Common to pre-tenure and tenured faculty was the need for more time for development of new scientific directions and creative thought, and a sense that "high risk" ideas are not strongly encouraged. In addition, pre-tenure faculty responses suggested a pronounced lack of work-life integration as well as a lack of familiarity with colleagues outside of the survey participant's primary department. Noted among tenured faculty was a sense of lack of input during decision making. Text mining and topic modeling of interviews of a subset of faculty indicated a desire for more venues for "middle managers" to advise (Q1), that diversity is valued but not always readily available (Q2) and taking risks is not discouraged internally, but should be avoided by pre-tenure faculty (Q3). These observations, combined with input from the established working groups listed in the Discussion table, provide the rationale for the initiatives we will focus on during Phase II.



Q1: Are there opportunities to discuss challenges as a scientist at the HSC?

Word cloud: place, groups, department, helpful, probably, committee, better, forum, come, something, new, talk, bringing, person, comfortable, know, meetings, idea, issues, first, can, good, say, forum, things, really, chair, stuff, kind, go, people, just, might, part, discuss, get, open, may, small, topics, faculty, one, feel, going, bring, college, HSC, advisory, mean, like, maybe, chairs, opportunities, level, specific, general, always, scientific, way, group, venue, guess.

Q2: Do you feel like our team welcomes differences (unique ideas, different styles etc.)?

Word cloud: science, especially, forward, sometimes, kind, way, sure, brought, welcomed, whole, ideas, ways, collaborative, say, example, team, backgrounds, big, HSC, absolutely, health, rewards, good, like, can, feel, valued, talents, faculty, really, people, valued, culture, even, great, schools, specific, just, unique, cancer, fine, diverse, center, always, things, try, program, places, certainly, skills, get, see, sense, everyone, promote, environment, definitely, measurable, global, collaborate, general, helpful.

Q3: Is the HSC work environment one in which you can take risks as a scientist?

Word cloud: terms, stuff, fail, professor, time, want, US, comfortable, factor, funding, trying, taking, HSC, always, risks, really, big, things, risk, take, risky, know, right, go, get, can, feel, like, tenure, people, different, high, grants, just, new, research, good, probably.

Discussion

Informed by baseline data specific areas will be focused on in Phase II of this project including; (1) prioritization of time for development of new scientific directions, (2) efforts to enhance work-life integration, (3) strategies to increase connectedness of faculty across disciplines and (4) opportunities for faculty input during decision making. Groups with whom we will share data and seek input, as well as Phase II initiatives, are summarized below.

Established Working Groups (Input will be sought on Phase II activity design)	Phase II Initiatives
Basic Science Department Chair's Working Group	Science and Creativity Summit
Campus wide STEM Deans Council	Time Management Workshop(s)
Jr.-Mid Career Advisory Team	"Speed Dating" event across disciplines
HSC Center-Institute Director Working Group	Establish a tenured faculty advisory panel for input into HSC decision making
Thematic area scientific teams (Exp. Therapeutics, Inhalation Toxicology, Bioenergetics and Metabolism)	Expansion of Evening of Science format (Post-meeting family dinner/activity)

Our long-term qualitative indicator of change will be evaluated by re-administration of the survey to the faculty who participated to generate the baseline data. This will be completed in January 2020 with data analysis being identical to that used during Phase I.

Ongoing quantitative indicators include number of attendees at Phase II activities, pre- and post surveys to evaluate acquisition of new skills during the project sponsored initiatives, subsequent surveys focused on implementation of new skills and evaluation of emerging collaborations and teams. We will continue to monitor extramural awards data, grant submission numbers, funding success rate, and proportion of multi-investigator initiatives.

Conclusion - Impact

Baseline data highlight specific areas in which indicators of psychological safety and resilience among faculty are sub-optimal. Given the impact of perceptions of safety and resilience on productivity, creativity and likelihood of being part of a high-functioning team, these indicators are relevant to scientists meeting their highest potential. Causality between "interventions" and outcomes will be extremely challenging to prove. However, to not address these areas of opportunity would ignore a body of literature and aspects of culture that have the potential to enhance our scientific impact and the overall well-being of our faculty. In addition, this model can be further developed for application to other academic settings.