

Taking stock of campus mentoring ecosystems: a peer assessment dialogue exercise

Mentoring
ecosystems
peer
assessment

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Abstract

Purpose – The purpose of this study was to examine the experiences of multiple campus teams as they engaged in the assessment of their science, technology, engineering and mathematics (STEM) mentoring ecosystems within a peer assessment dialogue exercise.

Design/methodology/approach – This project utilized a qualitative multicase study method involving six campus teams, drawing upon completed inventory and visual mapping artefacts, session observations and debriefing interviews. The campuses included research universities, small colleges and minority-serving institutions (MSIs) across the United States of America. The authors analysed which features of the peer assessment dialogue exercise scaffolded participants' learning about ecosystem synergies and threats.

Findings – The results illustrated the benefit of instructor modelling, intra-team process time and multiple rounds of peer assessment. Participants gained new insights into their own campuses and an increased sense of possibility by dialoguing with peer campuses.

Research limitations/implications – This project involved teams from a small set of institutions, relying on observational and self-reported debriefing data. Future research could centre perspectives of institutional leaders.

Practical implications – The authors recommend dedicating time to the institutional assessment of mentoring ecosystems. Investing in a campus-wide mentoring infrastructure could align with campus equity goals.

Originality/value – In contrast to studies that have focussed solely on programmatic outcomes of mentoring, this study explored strategies to strengthen institutional mentoring ecosystems in higher education, with a focus on peer assessment, dialogue and learning exercises.

Keywords Mentoring, Mentoring and coaching in higher education, Peer observation and internal audit, Organization studies

Paper type Research paper

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Introduction

Mentoring programmes promote the success of racially minoritised students in science, technology, engineering and mathematics (STEM) fields at the undergraduate and graduate levels, often by serving as a protective, communal buffer within predominantly white institutions (PWIs) of higher education (Maton *et al.*, 2009; Rudolph, 2019; Wilson *et al.*, 2012). Research documents the complex experiences of students of colour finding connections in mentoring programmes whilst also facing a generally unwelcoming environment within PWIs (Tuladhar *et al.*, 2021), such as being negatively stereotyped by faculty or excluded by peers outside of the mentoring programme (Gámez *et al.*, 2022; McGee, 2016). Indeed, the support received in a mentoring programme may serve as an exception rather than the behavioural norm for people of colour within STEM fields (O'Meara *et al.*, 2019).

If student success is a goal – with equity at the forefront – then a focus on individual mentoring programmes alone cannot advance STEM higher education (National Academies of Sciences, Engineering and Medicine (NASEM), 2019). An intentional, multi-institutional, cross-disciplinary strategy is necessary in order to establish a more consistent culture of mentoring (Choi *et al.*, 2019; Johnson *et al.*, 2023). We developed a STEM mentoring ecosystem framework (Mondisa *et al.*, 2021), along with tools and exercises designed to help campuses take stock and set goals. In this paper, we focus on a peer assessment dialogue exercise that places campus teams into dialogue with others from peer campuses. We aimed to learn more about which features of the exercise supported the learning process and the nature of the participants' learning.

Literature review

This study builds upon prior literature focussed in three key domains: ecosystem self-assessment, team knowledge as a form of distributed cognition and peer assessment dialogue exercises. This study uniquely contributes by drawing upon each domain to examine how the peer assessment dialogue exercise could strengthen institutional mentoring in a higher education context. This exercise could potentially be used by those working in higher education and mentoring contexts more generally.

First, we leveraged prior research that demonstrates the value of engaging in ecosystem self-assessment across fields. Mapping community assets has been invaluable in assessing capital and services in other contexts including environmental studies and public health (Lim *et al.*, 2021; South *et al.*, 2017). Using an inventory tool to document assets (Bagstad *et al.*, 2013; Manuel *et al.*, 2015) and creating a pictorial display to illustrate assets and threats to the infrastructure (Jasek-Rysdahl, 2001; Näykki and Järvelä, 2008) can assist in the valuation of resources for decision making. In this project, we built upon our prior theoretical work developing an ecosystem framework for higher education, with a focus on STEM mentoring (Mondisa *et al.*, 2021). We equipped campus teams with two tools that aligned with this framework: (a) an inventory for mentoring activities and (b) a visual map where they could display the location and distribution of mentoring activity across their institutional mentoring ecosystem. Our study contributes to an understanding of how ecosystem tools can be used in higher education to support self-assessment of and dialogue about institutional mentoring strengths and threats to infrastructure.

Second, we drew upon prior literature focussed on team learning as a form of distributed cognition. Distributed cognition refers to situations where learning involves multiple people (Toon, 2014) and “a task is achieved . . . by coordinating and combining multiple individual representations” (Williamson and Cox, 2014, p. 642). The peer dialogue exercise placed campus teams, comprised of individuals who brought different viewpoints from their respective roles on campus, into conversation with one another about their visual maps. The cohort of participating campus teams generated collective knowledge about their STEM mentoring ecosystems; our study adds to the literature by studying the knowledge generated by teams, including threats to their mentoring infrastructure.

Third, we drew upon prior research in education to design our peer dialogue exercise. Peer dialogues have been used in professional educational settings, demonstrating added value beyond self-assessment or dialogues with supervisors (Knezic *et al.*, 2019). Providing a structure for the dialogue (Deiglmayr, 2018) and training for the assessor (Eather *et al.*, 2017; Gielen and De Wever, 2015) can improve productivity. In addition, bidirectional dialogue, where both parties assess and are assessed, is beneficial (Hwang and Chang, 2021). To prepare teams, we first modelled strategies for engagement within this exercise, such as noticing clusters of mentoring activity on sample campus mentoring ecosystem maps and a prompt to open dialogue (e.g. “Tell us more about how this cluster of programs came to be”).

Even with these scaffolds in place, the researchers were aware that peer assessment dialogue in higher education can be impeded by perceptions of competition (Kezar and Holcombe, 2018). We emphasized the opportunity for campus teams to learn from each other within the exercise, and we assigned two rounds of peer dialogue; each team was assigned a first round of dialogue with a team from a similar peer campus (e.g. a research university was paired with another research university), followed by a second round with a team from a less-similar peer campus (e.g. a research university was paired with a predominantly undergraduate institution). This study afforded the opportunity to examine supportive features of the exercise and the teams’ learning from the exercise.

Research questions

- (1) Which features of the peer assessment dialogue exercise supported the participants’ learning process?
- (2) What new knowledge about ecosystem threats did the teams gain from their participation in the peer assessment dialogue exercise?

Methods

Research design

The researchers employed Stake’s (2006) multiple case study design. As Stake (2006) explained, “multicase study is not a design for comparing cases . . . the cases studied are a selected group of instances chosen for better understanding of the [phenomenon]” (p. 83). The goal is to inform a description of the activity, programme, or phenomenon under study; here, the peer assessment dialogue exercise is in focus as a part of taking stock of the mentoring ecosystem. Following Stake’s (2006) guidance, we first describe how we studied the phenomenon (the peer assessment dialogue exercise) by outlining the case selection process and information about participants and then how we performed our data activity, including the data collection and analysis process.

Case selection

The researchers gained institutional review board approval at each researcher’s home institution (#607, 006476, 199272, respectively), which is the body that oversees research protocols involving humans. We identified potential campuses to invite into the process, informed by previous mentoring activities and STEM grant awards at the student or faculty level. Given our particular interest in STEM mentoring and equity, we recruited participants by reaching out to key leaders known to the research team, typically a lead administrator for academic affairs, with mention of including a key STEM faculty member or diversity, equity and inclusion (DEI) administrator. We aimed to include a range of institutions (e.g. predominantly undergraduate institutions, research universities and minority-serving institutions [MSIs]) whilst capping the total number at eight, as research employing a multicase method typically selects four to ten cases (Stake, 2006).

All initial invitees (refer to [Table 1](#)) accepted an invitation to participate in a three-part virtual workshop using Zoom video conferencing over the span of one semester (one meeting each month). The researchers followed appropriate informed consent procedures; those participating would permit meeting proceedings and completed artefacts to be collected and analysed as part of the project. The first meeting involved learning about the ecosystem framework and tools. Particular vocabulary terms were introduced to teams at this time to aid in the specificity of their inventories and visual maps. The vocabulary terms included mentoring asset (such as a programme or initiative), champion (someone who advocates for resources) and steward (someone shouldering responsibility or accountability). Teams left this meeting with instructions to complete the inventory and visual map in the coming month. Their visual maps were constructed in software called Jamboard that allows visual mapping and annotation and then placed in a virtual folder to enable shared access. In the second meeting, participants engaged with the peer assessment dialogue exercise. The third meeting was scheduled individually for each campus as a debriefing session and member checking.

Participants

Six campus teams completed the full three-session series, all of whom were renamed with pseudonyms representing their regions and institutional types. These included two predominantly undergraduate institutions (Western College and Midwestern College) and four research universities (Western R1, Eastern R1), two of which were MSIs (Southern R1 and Southern R2). Two additional campuses participated in a subset of the series; Midwestern R1 participated in the first introductory workshop but did not continue, citing time constraints, whilst North-western R1 MSI participated in the first and second workshops but not the third. These latter two campuses were not included in the current study.

Data activity

During the peer dialogue assessment exercise, each campus participated in two rounds of the peer dialogue assessment ([Table 2](#)). At the start of the session, we modelled various ways of examining the visual maps (e.g. studying concentrations of mentoring activity) and ways to open the peer dialogue sessions (e.g. how did this pattern of mentoring activity come to be?).

Each campus had 20 min in separate Zoom breakout room, during which participants examined the map created by the peer campus (see [Figure 1](#) for an exemplar map).

Each campus was then moved into a shared breakout room with another campus to discuss both maps. Each shared breakout room had a scribe and timekeeper (trained by the research team); the timekeeper asked one campus team to start as the assessor and alerted the

Institution	Type of institution https://cmsi.gse.rutgers.edu/sites/default/files/MSI%20List.pdf
Midwestern College	PUI
Western College	PUI
Southern R2: MSI	R2, HBCU, Public 4 yr
Southern R1: MSI	R1, HSI, Public 4 yr
Eastern R1	R1, AANAPISI, Public 4 yr
Western R1	R1, AANAPISI, Public 4 yr
Midwestern R1	R1, Public 4 yr
Northwestern R1: MSI	R1; MSI Public 4 yr

Note(s): PUI = [Primarily Undergraduate Institution]; R2= [Research 2 University]; MSI = [Minority-Serving Institution]; HBCU = [Historically Black College or University]; R1 = [Research 1 University]; HSI = [Hispanic Serving Institution]; AANAPISI = [Asian American and Native American Pacific Islander Serving Institution]

Source(s): Created by authors

Table 1.
Participating
campuses

room when 30 min had elapsed so they could change roles. In the second round, the process was repeated. Due to the uneven number of campuses, we had one trio of campus teams in dialogue within each round.

Data analysis

Our cases consisted of six primary higher education institutions, each of which provided key information about their experiences in the peer assessment dialogue exercise pertinent to their mentoring ecosystem assessment (Stake, 2006). The researchers organized a “bounded system” (Merriam and Tisdell, 2016; Stake, 1995), referring to the finite set of participants involved and materials through which to study the peer assessment exercise (see Figure 2).

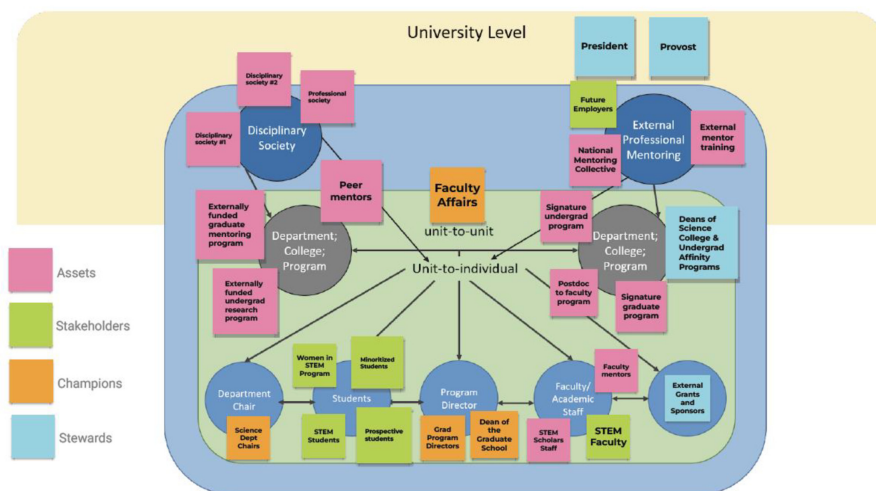
Researchers had access to scribe notes from each meeting, the artefacts generated by each team (mentoring inventories and visual maps) and researcher observations from Session 3’s debriefing.

Following Stake’s (2006) guidance, the research team generated an understanding of each case as pertinent to the broader activity under study: the peer assessment dialogue exercise.

	Round 1	Round 2
Peer assignments	A) Midwestern College and Western College B) Southern R1: MSI and Southern R2: MSI C) Western R1, Eastern R1, and Northwestern R1: MSI	A) Western College and Western R1 B) Eastern R1, Southern R1: MSI, and Midwestern College C) Southern R2: MSI and Northwestern R1: MSI

Note(s): R1 = [Research 1 University]; MSI = [Minority-Serving Institution]; R2 = [Research 2 University]
Source(s): Created by authors

Table 2. Assignment for peer assessment dialogues



Note(s): STEM = Science, Technology, Engineering and Mathematics
Source(s): Created by authors

Figure 1. Exemplar map

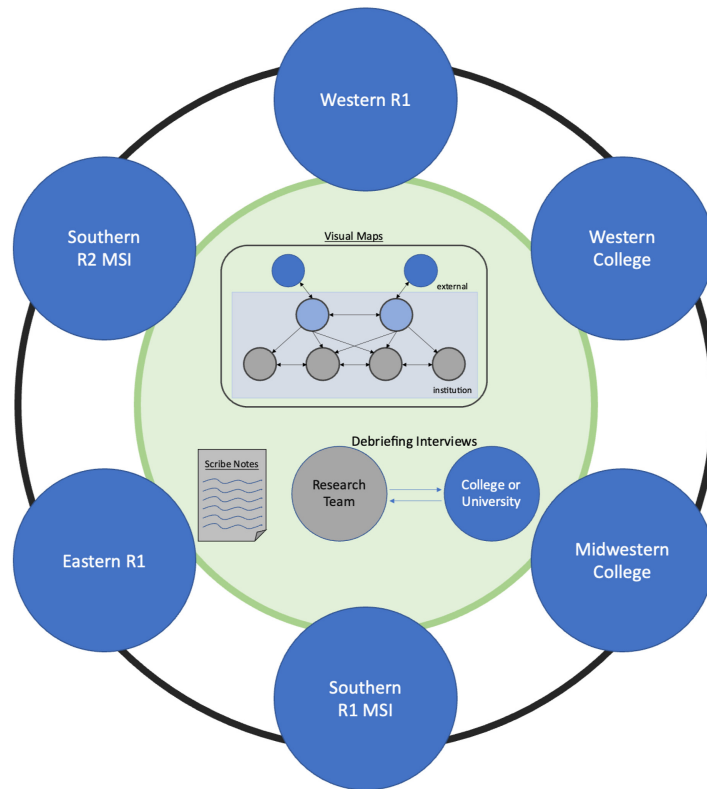


Figure 2.
Bounded system

Note(s): R1 = [Research 1 University]; R2 = [Research 2 University];

MSI = [Minority-Serving Institution]

Source(s): Created by authors

Each researcher took the lead in organising a summary of a particular campus and then each researcher added to the summaries, forming the basis of case records. Table 3 provides a helpful summary of each campus team's membership, goal and challenge.

For example, in our summary of Eastern R1, we noted that they brought a four-person team that included two key staff members from a signature mentoring programme designed to serve primarily students of colour in STEM, a central administrator of academic affairs and a student affairs staff member who oversaw residential-academic partnerships. Whilst they were proud of their signature programme, they were aware that many students were left out of that initiative, and they came to strategize how to better connect their other initiatives in order to bring more students into mentoring on their campus. In contrast, Western College brought a three-person team consisting of a faculty member who was also an administrator for academic affairs looking to improve faculty mentoring on campus, a STEM faculty member with experience with student-facing mentoring and a DEI administrator with knowledge of existing campus mentoring programmes. They were interested in looking at ways to connect initiatives for faculty mentoring and student mentoring. Despite their small size, this campus shared their concerns with campus silos and a fast-paced culture that they perceived as contributing to communication challenges.

Team	Team composition	Goal	Biggest perceived challenge(s)
Midwestern College	3 members <ul style="list-style-type: none"> ● 1 biological science faculty serving as a lead for major grant ● 1 administrator from advising ● 1 staff member supporting career development 	Improve coordination and communication	Rotating chairs in departments; sustainability challenges
Western College	3 members <ul style="list-style-type: none"> ● 1 administrator from faculty affairs ● 1 faculty from computer science ● 1 staff from DEI supporting student mentoring 	Reduce silos and improve communication across the institution	Projects tied to individual passions rather than roles; lack of time and people
Southern R2: MSI	5 members <ul style="list-style-type: none"> ● 3 faculty from across the institution ● 1 science administrator ● 1 administrator from new student programs 	Improve mentoring across institution, including mentoring for faculty	Lack of formalization of mentoring particularly for faculty; lack of consistency in student experience
Southern R1: MSI	3 members <ul style="list-style-type: none"> ● 1 biological science faculty ● 1 computer science faculty, both with student and faculty of colour mentoring experience ● 1 administrator in STEM 	Generating a comprehensive mentoring plan to avoid unnecessary duplication of effort	Great deal of variability in leadership and initiative across departments; lack of communication
Eastern R1	4 members <ul style="list-style-type: none"> ● 2 staff from a signature mentoring program for STEM students of colour ● 1 administrator from academic affairs ● 1 staff from student affairs involved in residential-academic programs 	Supporting students who are unaffiliated with signature programs; improve communication	Silos; lack of mentoring available for students unaffiliated with signature programs
Western R1	3 members <ul style="list-style-type: none"> ● 2 administrators and 1 staff from STEM-focussed office including partnerships and undergraduate research 	Lack of coordination and tracking undergraduate mentoring activities	Strengthening mentoring across institution over time for undergraduates, graduate students, and faculty

Note(s): DEI = [Diversity, Equity and Inclusion]; R2 = [Research 2 University]; MSI = [Minority-Serving Institution]; R1 = [Research 1 University]; STEM = [Science, Technology, Engineering, Math]

Source(s): Created by authors

Table 3. Summary of team composition, goal and challenges

The next step involved reading through these case summaries to identify factors, referring to influential variables of interest and connecting these factors to a corresponding theme, referring to a central idea of importance to the related situation (Stake, 2006, p. 64). Initial factors included support from central leadership, a previous grant initiative, strengths of certain department chairs and learning from their conversations with another campus team.

We organized our factors into tables, noting how each campus case informed a particular theme. Then, we noted connections amongst factors such as the location of the mentoring activity (e.g. centralized leadership, division level, department level), the relative concentration of the mentoring, historical context (e.g. a previously successful or failed initiative, a key figure or grant that paved the way) and barriers to sustainability (e.g. limited time, lack of funds). Given our research questions, we focussed on generating themes that pertained to the exercise design and threats to the thriving of the mentoring ecosystems.

Trustworthiness

According to [Lincoln and Guba \(1986\)](#), triangulation is an important strategy for strengthening the trustworthiness of one's qualitative research. Triangulation can be achieved in multiple ways; we used multiple data sources (e.g. our observations, participant documents, scribe notes) and multiple investigator triangulation. We also employed member checking, recommended by [Lincoln and Guba \(1986\)](#), which involves returning to the participants for input. Within Session 3, we met with each campus individually to debrief observations, gain feedback and clarify the learning process.

Positionality

We approached the research by taking roles consistent with qualitative case research, such that we actively constructed the findings ([Stake, 1995](#)) and recognized the importance of sharing our positionality. We are three mentoring researchers connecting across disciplines (psychology/education, biochemistry and engineering), all women of colour, with over 50 years of collective faculty experience. Each member of the research team brought relational capital to invite campuses to participate.

Results

Research question 1: exercise design

Three themes were generated regarding the exercise design: (a) modelling supported dialogue, (b) value of intra-team processing time and (c) multiple rounds contributed. We share each theme with case evidence.

Modelling supported dialogue. At the start, we modelled one way to engage in the exercise as noticing certain patterns of activity. We also demonstrated asking "How did this come to be?" as a way to open dialogue.

At the start of each round of peer assessment, each team viewed and discussed the visual map of a peer campus. We noticed the dedicated time and attention the participants took to examine the maps and how they followed our modelling as a way to begin. For example, when Southern R2: MSI began their analysis of Southern R1: MSI's map, they shared this observation, using this particular vocabulary we had offered for this work:

I noticed there were clusters of assets around the department and college level rather than the university level. How did this come about? I also didn't see a lot of external professional mentoring around those disciplinary societies and wondered about that.

Similarly, when Midwestern College began their analysis of Eastern R1, the team noticed details on the map in terms of where activity was clustered. Whilst one colleague noticed that they had many champions at the institutional level, a second colleague added, "Their assets are mostly at the program and department level. There's not much at the individual level or students-wise."

In this way, the map provided an alternative to spoken words; it provided a visual representation of campus activity. The visual also provided a place for teams to focus their

energy and open dialogue. Campus teams spent considerable time noticing where campuses had located their activities (department or university level) or how mentoring activity was dispersed or clustered. Whilst we saw our modelled strategies show up, teams engaged in additional ways. For example, they noticed the location of the mentoring activity and who was involved in that activity. Conversations also extended to particular strategies the campuses were using to invite more consistent participation of mentees or mentors, priorities of senior leaders, or previous efforts that had not worked.

Value of intra-team processing time. The start of each session involved intra-team time, where teams reflected on and processed the map of the peer institution. During this time, we could see the contributions of different team members and the perspectives each brought. One visible example of this processing was when Western R1 prepared to dialogue with Western College.

Participant 1: So, looks like their challenge listed is money and communication.

Participant 2: That's the tagline for higher education!

Participant 1: I wonder if fundraising from stewards isn't an issue?

Participant 2: I see that they have their stewards listed by name. Interesting that trustees are also listed as stewards.

Participant 2: But that connects back to us being a larger school – probably different relationships.

Participant 3: Are these stewards giving internal grants?

Participant 1: Is that internal?

Participant 3: Like our office?

Participant 3: Another question – are the chairs department stakeholders and not champions?

Participant 1: Maybe they view them differently than we do?

Western R1 noticed that Western College listed individuals by name, implying a greater sense of familiarity on a smaller campus, the possibility that department chairs played a different role on their campus and the grant-making function of their own office.

Another example of intra-team processing was when Eastern R1 prepared for dialogue with Southern R1: MSI. It was compelling to see teams taking the goal or challenge of the peer campus as a lens through which to process what they were observing.

Participant 1: [This campus] needs an inventory of all types of programs to see where there's duplication, if any. They need to work on finding out [pause] the sustainability and assessment of programs.

Participant 2: At a place so large, where will the comprehensive work be centered? What's the climate for that to happen?

Participant 3: They only have students as stakeholders. Are there mentoring programs for them? Compare this to our programs [Signature program 1] and [Signature program 2]. Might it be buried elsewhere?

Here, we saw an investment by the team as they aimed to understand the peer campus and then reflected back on their own campus by comparison.

As each team had constructed its own map, it was natural for participants to discover new perspectives on their own campus often by noticing similarities and differences between their map and that of another campus (e.g. Midwestern College perceived fewer silos on their campus than at Western College; Eastern R1 noticed they did not have a certain office that

Western R1 had). This time to process as a team gave space for campus teams to approach the dialogue with purpose.

Multiple rounds contributed. We noticed that teams especially appreciated being paired with similar campuses; they perceived that these teams could shed light on particularly useful strategies. One colleague from Eastern R1 commented, “We appreciated the pairing with Western R1 and Northwestern R1 based on size, problems, and so on.” In addition, a participant from Western College shared, “I really liked partnering with Midwestern College because it was similar in size; we had similar vocabularies.” The following exchange occurred when Western College was preparing to dialogue with Midwestern College.

Participant 1: I wondered if their goal was to get many programs or to coordinate existing departments?

Participant 2: I want to know if they have staff ready to advocate for students. I notice how assets are distributed nicely.

Participant 1: They have a lot of champions, but are missing stewards. Do they have coordinators for all of their programs, or are the programs in individual units?

Participant 2: What does a healthy ecosystem look like? Do they have staff support?

Participant 1: They seem to have a lot of students, STEM opportunities, and fellowships but I did not see any staff support.

Participant 2: Staff support is necessary because they need to monitor professional development and to bridge the gap between staff and students.

Whilst Participant 1 focussed on a range of topics, including coordination and which strengths were present or absent, Participant 2 focussed on staff support. Eventually, Participant 1 responded within the analysis of what was missing.

Next, in the dialogue between these two campuses, the Western College participants were able to learn more about these topics.

Western College Participant 2: Do you think there is a need for a coordinator, if yes, would this be a steward or a separately hired director?

Midwestern College Participant 1: Each program has a separate coordinator, but there is a need for a cohesive coordinator, and this would most likely be a champion as there are lots of stewards clustered at the college already.

Midwestern College Participant 2: There are different academic divisions and there is okay coordination between them [pause] the math and sciences department do very well and are coordinated well.

Western College Participant 1: Is your goal to have a lot of departments or to coordinate current ones?

Midwestern College Participant 2: Coordination is our priority.

Western College Participant 2: Is there staff support?

Midwestern College Participant 1: Yes, but not a lot, our support is cross-departmental.

Given that Midwestern College’s primary challenge focussed on coordination and communication and that Western College’s primary challenge was improving communication, this conversation provided a space for both teams to gather information that could be applied back to their home campuses.

The learning continued into the second round of dialogue. Participants benefited from interacting with campuses that differed from them in terms of size or demographics. Due to the uneven number of institutions, we included one trio conversation per round, which

optimized access to multiple perspectives. A colleague from Eastern R1 shared, “The trio seems to be a unique learning opportunity for engagement and being able to listen.” This was echoed by a Midwestern College colleague: “We had very similar challenges despite being from very different institutions. I was surprised at the similarity of challenges.”

Ultimately, teams appreciated the importance of their unique context when deciding on the value of various strategies. Many ideas were suggested, including forming a board of champions who would regularly convene on important mentoring initiatives across campus, creating a dedicated office to connect activity on campus, hiring an exemplary mentor to prepare others in mentoring, striving to embed expectations into a role rather than a person, enlisting the provost in assembling the ecosystem inventory team and hiring a coordinator who could work across multiple projects. A colleague from Southern R2: MSI summed this up: “I enjoyed working with peer institutions and seeing that there is no cookie-cutter solution. Your size and how you are divided into different departments – this matters.”

Despite the positive sentiment overall, at least one participant noted their perception of a limit regarding the range of campuses involved. This colleague from Western R1 wondered whether “there was one school missing . . . I would have preferred feedback from [prestigious Midwestern R1] or another one like it.” Despite this, the participant acknowledged that they had learnt about DEI from the MSI institutions involved.

Research question 2: threats to a thriving ecosystem

Three primary themes regarding threats to a thriving mentoring ecosystem were identified. These included (a) department variability in commitment, (b) lack of formalization and (c) convening the right team. We share each below along with case evidence.

Department variability in commitment. Institutions discussed how they wanted students and faculty alike to have consistent mentoring experiences. However, each department and college within larger institutions is different and autonomy is valued. One consequence of autonomy observed is variability in commitment to mentoring, dependent on who is leading the department. As Southern R2: MSI shared, “Some departments do [mentoring] well, and others do not.” Southern R1: MSI echoed this in their discussion of how organising mentoring for new hires could vary widely based on the person in charge of that task.

The discussion within the smaller institutions echoed these sentiments. Midwestern College discussed the practice of having rotating chairs, resulting in an uneven prioritization of mentoring. One team member explained, “Not all faculty are interested in mentoring at the systems level – certainly individual faculty have interest in their advisees and students, but not all are invested at the level of ecosystem stewardship.” Western College added, “People have their passion project and enter into a role, but we want to assign responsibility to particular offices [for that mentoring], so that doesn’t just end when the person leaves the role after three years.” Another difficulty is that many people “wear multiple hats” in smaller institutions, leading to a blurring of boundaries and a sense of scarce resources. Eastern R1 acknowledged a similar institutional vulnerability that is more visible when a role “turns over” and that new person may not have “the same vision and connections [as the previous].” Within this discussion, we noticed how temporariness can threaten both departmental and institutional commitment to mentoring.

Lack of formalization. At Southern R2: MSI, there was an assumption that mentoring was embedded everywhere because of its institutional culture and values. One colleague wondered what was holding them back from formalization. An administrator from the team shared, “We are looking at this at [department] level to make it required. We have department programs in which they are very active and some that are not. They want [all students] getting the same thing.” Another colleague suggested that they needed training: “I’d recommend putting someone in place for the liberal arts to show STEM how it is done. Have people trained by someone who did it well.”

At Western College, the team wanted to see “something a little bit more formal” when it came to onboarding. They shared that “a lot of support and mentoring happens informally, but can we get a structure to sustain mentoring among staff?” This campus conversation was surfacing due to feelings of burnout, which diminished prevalence of informal mentoring. The conversation for Eastern R1 took a slightly different path, as they recognized that they had a strong formalization for one particular group of students but not for others outside of this group. They reflected on how other campuses were approaching this dilemma, noting that they could be more coordinated in their efforts to reach students unaffiliated with a signature initiative. Midwestern College lamented the end to a major grant funding source, which could curtail the activities of anchor programmes that they relied on for supporting historically excluded students. Both campuses hoped to embed more formalization for a broader cross-section of students.

Within this discussion, we noticed how some campus teams discussed general education requirements as a mechanism for formalising mentoring resources whilst others brainstormed additional strategies to bridge the gap between the programme experience and the general experience for students at the institution.

Convening the right team. Engaging in mentoring ecosystem assessment calls for the perspectives of a diverse team, spanning units, roles and levels. Participants remarked on needing additional folks to “fill in the blanks” as their team did not have the full purview of campus-wide mentoring. One Southern R2: MSI participant offered that she did not even realize that there were programmes on campus until they had conducted the inventory, revealing that they did not have enough internal communication about who was doing what. In addition, the Eastern R1 team consisted of two staff members from a signature programme and a central administrator; they noticed early on that they did not have a faculty perspective. A resonant perspective was shared by one member of Midwestern College, who observed, “I saw the importance of identifying a diverse team. Not just asking my faculty colleagues – this was super helpful.”

Whilst our original invitation involved reaching out to senior leaders to assemble the team, it is possible that the participation of a senior leader on the team could have made a difference. One team member from Southern R1: MSI wondered whether she was “the right person” to engage in the exercise, whilst a second colleague recommended having a dean or provost and a chair on the team so they could “understand the power of these types of teams.” Beyond this, we noticed that campuses took stock of what they were doing for undergraduates, and this did not necessarily align with what was being done for graduate students. Further, they wondered how the institution could better support faculty mentoring in a consistent manner across departments and colleges. This illustrated how the team learning was influenced by which members participated in the exercise. There were different sources of knowledge to inform undergraduate, graduate and faculty mentoring efforts. Team members offered their perspectives as staff within signature programmes, faculty across different departments and units and central administrators.

Discussion

The primary goal of this project was to learn more about the peer assessment dialogue exercise designed to support institutions as they engaged in taking stock of their mentoring ecosystems. Modelling ways to engage with the visual maps, providing teams with time to process and engaging in multiple rounds of dialogues contributed to the participants’ learning.

Distributed cognition suggests that interdisciplinary teams bring a set of valuable perspectives (Derry *et al.*, 1998). This study underscores that the composition of the team contributes to the learning generated. Higher education leaders need to enlist cross-role,

cross-unit and cross-level teams in this effort; otherwise, the nature of the learning is not as comprehensive. Learning requires dedicated time to prepare for and engage in processing both as a campus team and within a cohort of campuses. Additional perspectives beyond distributed cognition could help inform this work, including [Elrod and Kezar's \(2016\)](#) institutional change model, which emphasizes the organizational capacity and readiness for change; campus teams may need to pause and collect information as a team when they encounter challenges and be realistic about which challenges they can respond to with the team they have available.

Whilst participants appreciated dialogue with teams from campuses similar to their own in size and demographics, they were surprised by how much they learnt from teams representing different types of campuses. Prior literature described the persuasive power of "brand name" peer campuses, which can compel others into action; thus, who is in the cohort of campuses can influence participation in subsequent learning ([Posselt, 2020](#)). Although one campus mentioned their wish for a particular elite campus, overall, by the time campuses reached the second round of peer assessment, they appeared more inclined to appreciate the broader range of perspectives offered. [Harvey et al.'s \(2019\)](#) research emphasized team open-mindedness as an important contributor to team learning. We noted that campuses were more likely to see their own unique context in a new light after the dialogue rounds.

Peer dialogue assessment exercises like this one can help campus teams to enter into collaborative positions to strengthen the institutional mentoring infrastructure. Institutions identified concern about department variability in commitment to mentoring, a lack of formalization of mentoring resources and not having the right team – each of which can threaten their mentoring infrastructure. It was compelling to observe teams sharing strategies to cultivate a culture of mentoring (e.g. [Johnson et al., 2023](#)) across undergraduate students, graduate students and faculty. Whilst they acknowledged their anchor mentoring programmes, they strategized how to expand their impact across their institutions.

This exercise can help institutions see where they have gaps inconsistent with an institutional commitment to mentoring even as their institutions espouse and they personally endorse such commitments. Moreover, whilst research on mentoring has focussed on improving the quality of faculty and staff relationships with students ([Evans et al., 2022](#)), this study indicates that parallel work is needed that aims to strengthen the quality of mentoring for faculty and staff on campuses. If faculty and staff mentors are not being cared for in their own career trajectories, institutions are not in a position to sustain mentoring efforts for students.

Limitations and future research

This study has some key limitations. Whilst appropriate for our method, this study involved the perspectives of teams from a small set of institutions, relying primarily on observational and self-reported debriefing data. Institutional change work at the national and international level can also shed light on equity in STEM. For example, those involved with the Athena Swan gender equality charter initiative in the United Kingdom have documented the learning generated by institutions as they undergo voluntary self-assessment along with external review. From this work, institutions can view a range of effective policies and initiatives to which they can compare their own progress ([Kalpazidou Schmidt et al., 2020](#)). [Rosser et al. \(2019\)](#) argued that when looking at the Athena Swan Charter work and the U.S. National Science Foundation ADVANCE grant programme, future work needs to continue pushing towards changing the systems themselves, including tenure and promotion guidelines. In addition, we are aware that self- and peer assessment is also a starting point and does not necessarily indicate that a campus is in a position to or is willing to act.

The learning was shaped by the teams assembled, including which roles were represented. We accepted the teams as they were offered, which aligned with our goals of having various campus teams engage with this exercise and learn from each other. Future work could deliberately guide the specific composition of the teams involved. What is learnt when people within the same unit or college are involved compared to cross-unit, cross-institution, or senior leadership roles? Future research needs to examine the perceptions of mentors and would-be mentors (Olson and Nayar-Bhalerao, 2021), and this research needs to expand to include directors of programmes, individual faculty mentors and administrators seeking ways to better support mentors on campus. We anticipate strong value from supporting emergent and senior leaders as environmental stewards because of the role they can play to strategically support mentors (Montgomery, 2020). Such stewardship work further supports a sustainable mentoring ecosystem.

Practical implications

Despite these limitations, we see a number of practical implications from this project. We anticipate that campus-level mentoring work will only expand as higher education grapples with limited resources, and it is not realistic to simply create more programmes. An investment in mentoring infrastructure is an investment in retaining students and faculty alike. Towards this end, we make three key recommendations, organized in order of priority.

- (1) *Dedicate and recognize time for ecosystem assessment.* Campuses need to allocate time to convening those involved in the broader mentoring infrastructure. Regular dialogue can promote the identification of synergies and may require institutions to think differently about how they recognize service and leadership assignments. Many of our current practices for committee or task force work may contribute to inequitable workloads rather than intentionally and fairly promoting synergistic advancement of institutional visions (O'Meara *et al.*, 2017). If mentoring matters on campus, then mentoring ecosystem work should be recognized and rewarded.
- (2) *Start where you are and set the scope appropriately.* Ecosystem assessment could be conducted at the micro level, within a department or unit, or at a broader level, spanning multiple units across the university or multiple universities. It is important that the team starts dialogues where it makes sense for them and bound the problem scope appropriately to their capacity. Each campus has a unique context, with strengths to build upon and limitations to address (Jones and Kunkle, 2022). Campuses should resist the temptation to look at what other programmes or campuses are doing and assume that it is possible to “copy and paste” those strategies without adaptation.
- (3) *Ask questions in the spirit of exploring opportunities.* Campus programmes can find themselves competing for the same students or engaging in unintended duplication of efforts. Identifying places of overlap can be threatening in a context where such discoveries can lead to programme cuts rather than expansions of impact. Generating key reflection questions can guide the dialogue into a productive space (Porter, 2022). We observed the power in asking reflection questions in the spirit of exploring opportunities, such as “How did it come to be this way?”, “Where is collaboration already working well?”, “What would synergy look like between these units?” and “What does stewardship from [name of individual] look like?”

Conclusion

This project underscores the importance of assessing broader mentoring ecosystems, both by teams individually and in dialogue with one another. To maximize campuses' investment of

time and energy, we recommend the intentional construction of teams, cohorts and protocols for engagement. There is a valued place for mentoring programmes and, we hope, initiatives that intentionally bring these programmes into connection with one another. Such efforts are crucial for advancing mentoring, student success and faculty success in higher education.

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