Technical Report

Improvement Network Health and Development Study: Constructing the Practice and Professional Profiles of Hub Leaders

October 2026

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Author Note

This technical report is based on research funded by the Gates Foundation. The findings and conclusions contained within are those of the authors and do not necessarily reflect positions or policies of the Gates Foundation. The authors declare no conflicts of interest with respect to the research, authorship, and/or publication of this manuscript. Address all correspondence to: Elizabeth Jones, Marsal Family School of Education, Center for the Study of Higher and Postsecondary Education, University of Michigan. E-mail: esst@umich.edu

Introduction

The Improvement Network Health and Development (INHD) Study is led by Partners for Network Improvement, in collaboration with colleagues from the University of Pittsburgh, Vanderbilt University, the Carnegie Foundation for the Advancement of Teaching, the University of North Carolina at Chapel Hill, and the University of Michigan (Russell et al., 2025b). The INHD Study aims to conduct research on (and to support the development of) educational improvement networks in which a central, "hub" organization collaborates with school-based improvement teams to use a common approach to improvement research to address a shared educational aspiration, need, or problem (Russell et al., 2025a).

The INHD Study is anchored in a conceptualization of educational improvement networks as scientific-professional learning communities (SPLCs), with hub leaders as their primary drivers (Russell et al., 2025a). Hub leaders are the individuals and teams within hub organizations that share primary responsibility and accountability for the development, operations, and success of their networks (Peurach et al., 2025). Hub leadership is the practical work of developing, operating, and managing these networks as contexts in which to produce and manage knowledge for educational improvement.

Given the theoretical and practical centrality of hub leaders and hub leadership, the INHD Study includes a sub-study focused on (a) conceptualizing the practice and organization of hub leadership and (b) developing items for the primary data collection instrument of the Improvement Network Health and Development Survey (the primary data collection instrument of the INHD Study) useful for analyzing and supporting the practice and organization of hub leadership. See Peurach et al. (2020) and Peurach et al. (2025) for reports on efforts to

conceptualize hub leadership. See Duff et al. (2026) for a report on the development of survey items for the INHD Survey.

Drawing on the conceptual foundations and survey data from the sub-study of hub leadership, this technical report details procedures for constructing two profiles of hub leaders that serve the research and support ambitions of the INHD Study.

- The INHD Hub Leadership Practice Profile represents (a) the FTE allocation of hub members to the hub organization, (b) the array of formal roles among members of the hub leadership team (and the ostensive, "in-principle" responsibilities associated with each role), and (c) levels of engagement of hub members in core domains of practical work central to hub leadership.
- The INHD Hub Leadership Professional Profile represents (a) the professional qualifications of hub members and (b) hub members' self-assessments of their preparedness and confidence in their work.

The Practice Profile and the Professional Profile can be used to aggregate and represent evidence on hub leaders and hub leadership among a sample of educational improvement networks. They can also be used to aggregate and represent evidence on hub leaders and hub leadership for individual networks that can then be compared with the broader sample of networks.

The technical report is structured in the three primary sections:

- An overview of the survey items on the INHD Study that are used to construct the Practice and Professional Profiles.
- The procedure for constructing the Practice Profile.
- The procedure for constructing the Professional Profile.

Throughout this technical report, we primarily use evidence generated from the 2023/2024 administration of the INHD Survey to illustrate the construction of the Practice Profile and Professional Profile among a group of 30 networks participating in the Networks for School Improvement initiative funded by the Gates Foundation (Russell et al., 2025a). The hub leadership items on the INHD survey were administered to network members identified by a network representative as serving in the hub organization. The 2023/2024 administration includes responses from 218 hub staff members (of 289 total possible hub members; 75%). In the professional profile, we also drew on data that our 2023/2024 sample of hub members provided in the 2022/2023 administration of the survey; there were 139 respondents for whom we were able to do this (64% of 2023/2024 hub members).

Overview: INHD Survey Items

We developed procedures for constructing the Practice Profile and the Professional Profile from respondents' data from the 2022/2023 and 2023/2024 administrations of the INHD Survey. See *The Evolution of the Hub Leader Survey* (Duff et al, 2026) for the complete list of hub leadership survey items administered in each year.

As detailed in Duff et al. (2026), the survey items for hub members were refined from year-to-year as we analyzed and validated responses. Additionally, between 2022/2023 and 2023/2024, items focused on the professional demographics of hub leaders were eliminated from the survey for two reasons: (a) to reduce the generation of redundant data from year-to-year and (b) to reduce the time required to complete the survey. Future efforts to fully operationalize the production of the Practice Profile and the Professional Profile will require the administration of the full bank of survey items on hub leadership in each annual administration of the INHD Survey.

The Practice Profile draws on the following survey items:

- **Hub leadership:** I am part of the leadership team within the hub *[No / Unsure / Yes]*

Hub responsibilities *[Yes / No]*

- **Executive responsibilities:** I set high level strategy and/or raise funds for this NSI's hub
- **Managerial responsibilities:** I develop, manage, and/or administer this NSI's hub
- **Technical responsibilities - coaching:** I provide improvement coaching and/or technical support to schools and districts in this NSI
- **Technical responsibilities – analyst:** I conduct data analysis and/or support research and development for this NSI
- **FTE:** What percentage of your time is budgeted for your work in the NSI? *[% write-in]*

Frequency of work related to:

[Never / Rarely / Sometimes / Often]

Building and managing a network

- Building systems and structures connecting the hub, schools, and (if applicable) districts
- Coordinating and managing activities among the hub, schools, and (if applicable) districts
- Developing social relationships, norms, and culture among the hub, schools, and (if applicable) districts

Supporting improvement activity within the network

- Developing improvement capabilities, routines, and tools in schools and (if applicable) districts
- Collaborating in improvement activities in schools and (if applicable) districts
- Analyzing data and evidence generated from improvement activities in schools and (if applicable) districts

Managing relationships external to the NSI

- Managing relationships between this NSI's hub and the organization by which you are formally employed
- Managing relationships between this NSI's hub and external stakeholders
- Managing relationships between this NSI and external stakeholders

Developing and managing the NSI's hub

- Staffing and developing the hub as a team
- Coordinating and managing hub operations
- Coordinating and managing hub operations
- Analyzing data and evidence to support hub operations

Analyzing and improving how the NSI functions

- Analyzing data about how this NSI functions as a learning community
- Discussing how this NSI functions as a learning community with other leaders and/or stakeholders
- Developing and evaluating interventions and strategies for improving how this NSI functions as a learning community

The Professional Profile draws on the following survey items from both the 2022/2023 and 2023/2024 administrations (as indicated):

Preparation & experience: General leadership

- Graduate degree in educational leadership (2023/2024) *[No / In progress / Yes]*

[Less than 1 year / 1 year / 2 years / 3 years (etc.) / 20+ years]

- Years of experience in formal leadership role (2022/2023)
- Years of experience supporting general improvement work in schools and/or districts (2022/2023)

Experience: Continuous improvement & networks

[Less than 1 year / 1 year / 2 years / 3 years (etc.) / 20+ years]

- Years of experience do you have using formal approaches to continuous improvement in educational settings (2022/2023)
- Years of experience do you have leading formal approaches to continuous improvement in schools and/or districts (2022/2023)
- Years of experience do you have working in an improvement network (2023/2024)

Experience: Hub leadership

[Less than 1 year / 1 year / 2 years / 3 years (etc.) / 20+ years / I do not consider myself a hub leader]

- Years of experience as a hub leader in an improvement network

Self-assessment: Abilities as a hub leader

[Do not agree / Slightly agree / Moderately agree / Agree / Strongly agree]

- Overall, my prior experiences prepared me to fulfill my responsibilities within the NSI

[Not at all confident / Slightly confident / Moderately confident / Confident / Very confident / I do not consider myself a hub leader]

- How confident do you feel as a hub leader in an improvement network?

Identifying Hub Leaders

In both the practice and professional profiles, we categorize survey respondents as either formal hub leaders or hub staff members. This classification is based on items from the INHD Survey that asked respondents to (1) indicate whether they identified as a member of the hub leadership team and (2) specify the categories of functional leadership responsibilities involved

in their work: executive, managerial, or technical (e.g., coach, analyst) responsibilities. Tables 1 and 2 present responses to these items.

Respondents who answered "no" or "unsure" to the item asking whether they identified as members of the hub leadership team were classified as hub staff members (n = 65). Respondents were classified as formal hub leaders if they answered "yes" to this item and also reported responsibility for at least one functional category of leadership work. As such, we categorized 126 of the 130 respondents who reported they were part of the leadership team as formal hub leaders; the remaining four who did not endorse holding responsibility for executive, managerial, and/or technical leadership were categorized as hub staff members.

We used responses to these items to develop a typology of formal hub leadership that further illuminates the work of improvement network hub leaders, as described in subsequent sections of this report. Although our primary focus is on formal hub leaders, we include hub staff members in our practice and professional profiles to enable analyses of "informal leadership" within hub organizations: that is, the extent to which hub staff members not serving in formal leadership roles also participate in the practical work of hub leadership.

Table 1

Frequency of Self-Identified Hub Leaders

	Frequency	Percent
Yes	130	60%
No	65	30%
Unsure	23	10%
Total	218	100%

Table 2
Formal Hub Leaders -- Combinations of Responsibilities

	Frequency	Percent
executive only	3	2%
executive + manager	8	6%
executive + coach	2	2%
executive + analyst	2	2%
executive, manager, coach	8	6%
executive, manager, analyst	12	9%
executive, coach, analyst	6	5%
manager only	3	2%
manager + coach	6	5%
manager + analyst	4	3%
manager, coach, analyst	8	6%
coach only	15	12%
coach + analyst	11	8%
analyst only	6	5%
all roles	32	25%
no roles	4	3%
Total	130	100%

Role Typology and Associated Responsibilities of Formal Hub Leaders

Within hub organizations, formal hub leadership roles are not yet structured in accord with a conventional, institutionalized role structure of the sort common in conventional K-12 public school districts (e.g., superintendents, principals, and their assistants and associates, as complemented by directors or chairs of functionally-specific sub-units). As such, we use a theory-based approach to developing a typology of hub leadership roles.

As detailed above, the INHD Survey includes a bank of items asking respondents to indicate whether their roles included one or more categories of functional responsibilities recognized by organizational scholars as both integral to the operations of complex organizations and differentiated by the knowledge and capabilities needed to enact them: executive

responsibilities associated with setting high level strategy and raising funds; administrative/managerial responsibilities within the hub organization; and technical responsibilities associated with (a) providing improvement coaching and/or technical support to schools and districts and/or (b) conducting or supporting data analysis or research-and-development for the network (Table 2).[1] We then worked inductively to discern patterns of responses from which we derived hub leadership roles (Table 3). Responses to the 2023/2024 administration of the hub leadership survey yielded the 16 combinations of functional responsibilities among formal hub leaders presented in Table 2.

Table 3
Formal Hub Leadership Roles

	Frequency	Percent
specialist - leader	14	11%
specialist-technical	32	25%
technical director	28	22%
expert generalist	52	40%
hub member	4	3%
Total	130	100%

In constructing the Practice and Professional Profiles, we then collapsed combinations with small numbers of respondents into a more parsimonious, tractable typology of four leadership roles that we then used to categorize formal hub leaders:

- *technical specialists* with no executive or administrative/managerial responsibilities;

[1] We drew this conceptual typology of responsibilities from the seminal sociological and organizational scholarship of Parsons (1960) and Thompson (1967), and their arguments that complex organizations can be analyzed and understood in terms of three broad categories of functional responsibilities: institutional/executive, administrative/managerial, and technical. These domains of functional responsibility serve different purposes within the organization, operate in accord with different logics, bridge differently to broader environments, and demand different knowledge and capabilities.

- *leadership specialists* with no technical responsibilities;
- *technical directors* with technical responsibilities and either executive or administrative/managerial responsibilities;
- And *expert-generalists* with executive, administrative/managerial, and technical responsibilities.

As described previously, the four formal leaders who did not endorse any of the above role categories were classified as hub staff members.

Constructing the Practice Profile

Again, the INHD Hub Leadership Practice Profile represents (a) the FTE allocation of hub members to the hub organization, (b) the array of formal roles among members of the hub leadership team (and the ostensive, "in-principle" responsibilities associated with each role), and (c) levels of engagement of hub members in core domains of practical work central to hub leadership. See Figure 1 for the Practice Profile for the NSI hub leaders constructed using data generated in the 2023/2024 administration of the INHD Survey. Below, we detail our procedures for developing each component.

FTE Allocation

As reported above, the INHD Survey includes a single item that asks respondents to report the percentage of their time that is allocated to their work in the hub organization. Inclusion of the FTE Allocation is linked to our conceptualization of hub organizations as "temporary organizations" whose members are typically appointed part-time to the hub organization while continuing to maintain responsibilities in a more permanent role in an organization in which they would otherwise work full-time.

Figure 1

INHD Hub Leadership Practice Profile

Hub Role	% of Hub Members	% of Formal Leaders	Supporting Improvement Activity (Technical)	Managing External Relationships (Executive)	Building & Managing the Network (Admin/ Managerial)	Analyzing & Improving the Network (Admin/ Managerial)	Integrating Equity into the Network (Admin/ Managerial)	Developing & Managing the Hub (Admin/ Managerial)
Staff Member	42%		2.0	1.2	1.7	1.8	1.5	1.2
Formal Leader	58%		2.3	2.0	2.4	2.3	2.1	2.1
Technical Specialist		25%	2.4	1.2	2.0	1.9	1.8	1.3
Leadership Specialist		11%	1.1	2.4	2.1	2.1	1.9	1.7
Technical Director		22%	2.5	1.9	2.4	2.2	2.0	2.0
Expert-Generalist		41%	2.6	2.4	2.6	2.6	2.4	2.6

Respondents were able to directly input the percentage of their time budgeted for work in their NSI, and these responses ranged from 0% to 100%, with a mean of 60.6% for the full sample of 2023/2024 hub leaders and staff members. Table 4 displays the distribution of responses across collapsed categories of FTE allocations for that same sample.

Table 4
FTE Allocations for Hub Leadership
Percent of Time Allocated to Hub Leadership for this NSI

	Frequency	Percent
< 25%	43	19.72
25-49%	34	15.6
50-74%	41	18.81
75-100%	100	45.87
Total	218	100

Engagement in Practical Work

The identification of formal hub leaders and staff members, their FTE allocation to the hub organization, and their roles provides perspectives on the organization of hub leadership. The Practice Profile is designed to go further, to provide perspectives on ways that hub members in different roles (both formal leaders and staff members) and with different levels of commitment engage in the practical work of hub leadership.

For this, we use the items detailed above to construct composite measure of levels of engagement in each of the domains of practical work that we have identified inductively in our earlier efforts to conceptualize hub leadership (Peurach et al., 2020; Peurach et al., 2025). For each domain of work, we first used confirmatory factor analysis using Cronbach's Alpha to establish construct validity (see Table 5). Each item loaded strongly and positively onto their respective factors. As such, we report (a) the overall mean and (b) the group mean for each role

using all of the items in that specific domain. Finally, we transformed the scale of the overall and group means from 1 (never) to 4 (often) to 0 (never) to 3 (often).

Table 5
Construct Validity for Practical Work

Construct	Alpha
Developing & managing the network	.86
Supporting improvement activity	.79
Integrating equity	.80
Managing external relationships	.88
Developing & managing the hub	.87
Analyzing & improving the hub	.86

Table 6 presents additional descriptive statistics (standard deviation) that the Practice Profile cannot accommodate but may be useful to those seeking further information.

Table 6
Summary Statistics for Engagement in Practical Work by Role Type
Engagement in Domains of Practical Work

Role	Supporting Improvement Activity		Managing External Relationships		Building & Managing Network		Analyzing & Improving Network		Integrating Equity		Developing & Managing Hub	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
All hub members	2.21	0.94	1.66	1.12	2.07	0.94	2.06	0.94	1.85	1.04	1.73	1.13
Hub staff members	2.03	1.03	1.20	1.12	1.66	1.03	1.75	1.05	1.50	1.09	1.24	1.10
Formal hub leaders	2.34	0.85	1.98	1.01	2.37	0.73	2.29	0.78	2.10	0.92	2.07	1.02
- Technical Specialist	2.36	0.76	1.22	1.00	2.04	0.79	1.88	0.82	1.76	0.88	1.32	1.03
- Leadership Specialist	1.10	0.91	2.40	0.54	2.10	0.69	2.05	0.75	1.85	1.18	1.73	1.09
- Technical Director	2.52	0.71	1.93	1.02	2.39	0.73	2.22	0.77	2.01	0.96	2.04	0.97
- Expert-Generalist	2.56	0.64	2.37	0.82	2.64	0.59	2.62	0.59	2.42	0.74	2.63	0.59

Constructing the Professional Profile

Again, the INHD Hub Leadership Professional Profile represents (a) the professional qualifications of hub members and (b) hub members' self-assessments of their preparedness and confidence in their work. See Figure 2 for the Professional Profile for the NSI hub members. We constructed this profile using data generated in the 2022/2023 and 2023/2024 administrations of the INHD Survey. We began sample construction with the 218 hub members who responded to questions about hub leadership in the 2023/2024 administration of the survey. In order to learn more about their leadership preparation and experience from items that were removed from the survey in the 2023/2024 administration to reduce the collection of redundant data and the time required to complete the survey, we drew on responses that 139 of these hub members provided in the 2022/2023 administration of the survey. As such, although we constructed this profile using data from the same pool of respondents across two survey administrations, the sample size varies from year to year. Further, because we drew on data from respondents who completed the survey in both 2022/2023 and 2023/2024, respondents with only one year of experience in the network (e.g., only 2022/2023 or only 2023/2024) were not included in the Professional Profile).

Preparation and Experience -- General Leadership

As reported above, the INHD Survey includes three items that ask respondents to report on their general preparation and experience as educational leaders. One of the items was included in the 2023/2024 administration of the INHD Survey. Two of the items were included in the 2022/2023 administration of the INHD Survey but eliminated in 2023/2024 as discussed above. First, respondents were asked in 2023/2024 to report whether they had a graduate degree in educational leadership or were making progress towards one. All respondents who reported that

Figure 2

INHD Hub Leadership Professional Profile

	Hub Staff Members	Formal Leaders Only	Technical Specialist	Leadership Specialist	Technical Director	Expert-Generalist
2024 (n=218)	92	126	32	14	28	52
2023 (n=139)	48	91	23	10	19	39
	Hub Staff Members	**Formal Leaders Only**	**Technical Specialist**	**Leadership Specialist**	**Technical Director**	**Expert-Generalist**
Preparation & Experience: General Leadership						
% with graduate degree in educational leadership	36%	57%	56%	64%	68%	50%
Avg years in a formal leadership role*	5.40	9.20	9.20	8.10	7.20	10.50
Avg years supporting general improvement work in schools and/or districts*	6.20	9.00	8.10	9.30	6.90	10.60
Experience: Continuous Improvement & Networks						
Avg years using formal approaches to continuous improvement in educational settings*	4.80	6.70	6.60	5.90	5.40	7.60
Avg years leading formal approaches to continuous improvement in educational settings*	4.30	6.00	5.90	5.50	4.80	6.90
Avg years working in an improvement network*	3.10	5.30	4.80	5.40	4.10	6.20
Experience: Hub Leadership						
Avg years working as a hub leader in an improvement network*	1.20	4.10	4.00	3.60	2.80	5.10
Self-Assessment: Abilities as a Hub Leader						
My prior experiences prepared me to fulfill my responsibilities within this NSI*	4.10	4.20	4.50	4.10	3.90	4.20
Overall confidence in the work of hub leadership**	3.50	4.20	3.90	4.00	3.90	4.50

* Scale = 1/do not agree to 5/strongly agree

** Scale = 1/not at all confident to 5/very confident

they had this degree or were currently working towards one were included in the percentage of hub staff members and leaders with a graduate degree in educational leadership in the professional profile.

In the 2022/2023 administration of the survey, respondents were asked to report the number of years of experience they had in a formal leadership role and with supporting general improvement work in schools and/or districts. For each item, respondents were able to select from a menu of responses that ranged from "less than one year" to "20+ years", with years that increased by an increment of one in between. To calculate average years' of experience presented in the professional profile, we recoded "less than one year" as 0 and "20+ years" as 21 for the item from the 2023/2024 survey administration. For the two items from the 2022/2023 survey administration, we added one year to each hub members' response in order to make this information consistent with the experiences respondents reported in 2022/2023. As such, a response of "less than one year" became one year, a response of "one year" became two years, and so on.

Experience – Continuous Improvement and Networks

To construct a representation of hub members' experiences with continuous improvement and networks, we drew from two survey items from the 2022/2023 administration and one from the 2023/2024 administration regarding years of experiences: using formal approach to continuous improvement in educational settings, leading formal approaches to continuous improvement in education settings, and working in an improvement network. As above, for each item, respondents were able to select from responses that ranged from "less than one year" to "20+ years." We performed the same recoding procedures as described previously.

Experience -- Hub Leadership

In the 2023/2024 survey, respondents were asked to report how many years of experience they had working as a hub leader in an improvement network. As described previously, the response options ranged from “less than one” to “20+ years”, and responses were re-coded accordingly to allow for the calculation of averages. In addition, respondents were able to select “I do not consider myself a hub leader” in response to this question; those who did so were excluded from the calculation of averages for this item.

Self-Assessment – Abilities as a Hub Leader

We used two items from the 2023/2024 survey administration to generate insight about hub members’ perceptions of their abilities. First, we asked respondents to rate their level of agreement using a five point Likert scale (do not agree to strongly agree) with the following statement: overall, my prior experiences prepared me to fulfill my responsibilities within this NSI. Next, we asked respondents to rate how confident they felt in their work as a hub leader, using a five-point scale that ranged from not at all confident to very confident. In addition, respondents were able to select “I do not consider myself a hub leader” in response to this question; those who did so were excluded from analysis of data from this item. For each of these items, we then calculated the average rating for each group of respondents presented in the Professional Profile.

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